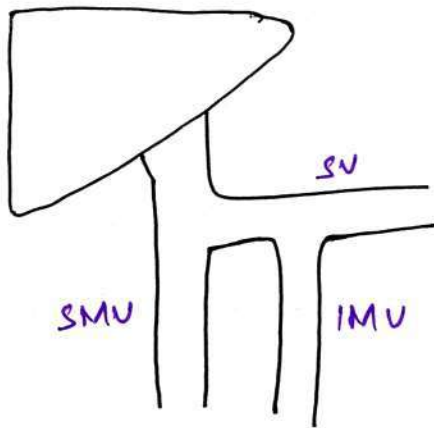
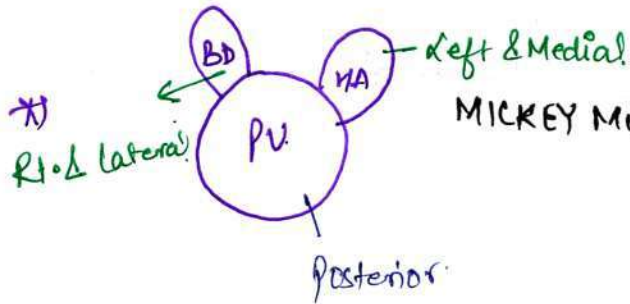
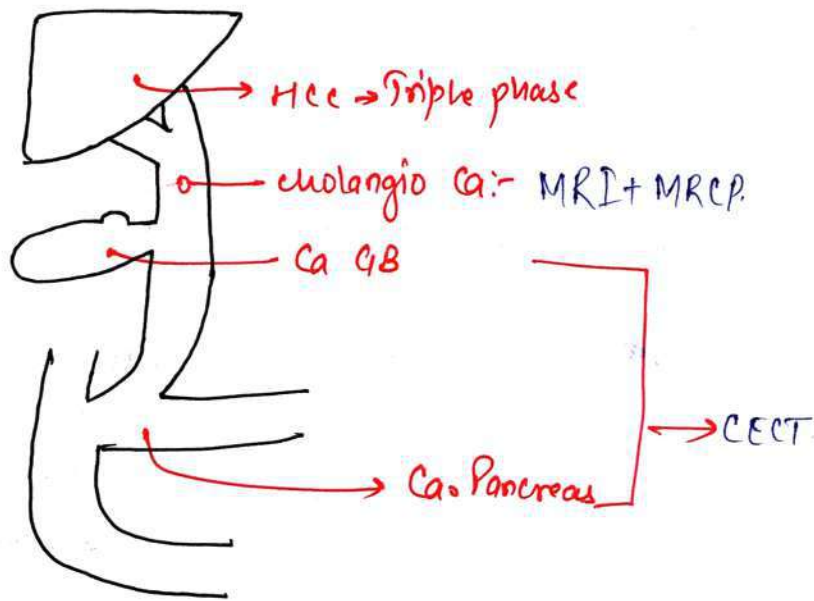


LIVER

- Wt. of Liver in ♂ - 1800 gm
♀ :- 1400 gm
- Glycogen storage capacity :- 65 gm/kg of liver tissue.
- Liver and lungs are having dual blood supply
- Liver supplied by - Portal vein :- 75% $\rightarrow$ 50-70% O_2 supply DNR
Hepatic artery :- 25% $\rightarrow$ 30-50% O_2 supply
- Only Organ in the body have property of Regeneration?

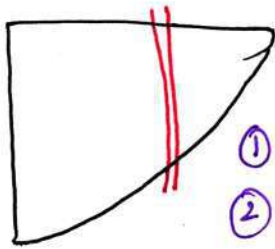


- * If a branch of portal vein ligated then Hepatic artery $\uparrow$ blood supply to the liver but not the Vice-versa.
- * HCC is supplied by ONLY BRANCHES OF HEPATIC ARTERY.
- * Loc for Dx of HCC :- TRIPLE PHASE CT
 - 1) Diagnostic criteria :- ARTERIAL PHASE HYPERVASCULARIZATION & VENOUS WASHOUT
 - 2) In Hepato biliary pancreatic Tract - Malignancy of Adult - FNAC OR Bx is not mandatory for Dx.

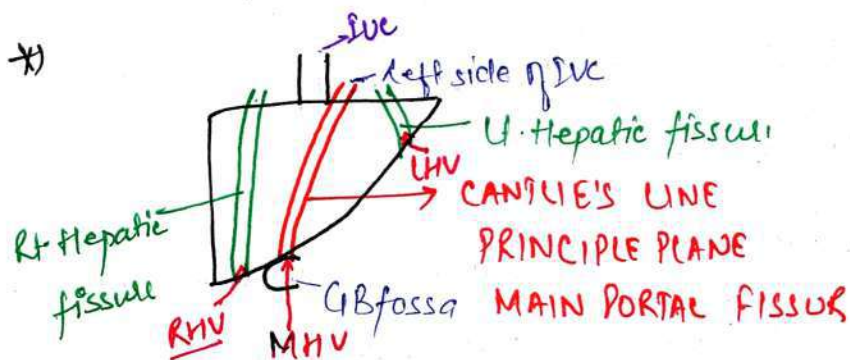


MICKY MOUSE :- Portal Triad appears as Mickey Mouse on USG

CODINAUD DIVIDED LIVER ON the Basis of:-



- ① PV & HA
- ② PV & HV ✓
- ③ HA & HV
- ④ PV, HA, BD



LHV - Lt. Hepatic vein
MHV - Middle Hepatic vein
RHV :- Rt. Hepatic vein.



3

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Q1. Insegmentectomy involve removal of

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U. Insegmentectomy involve removal of 2, 3, 4 + 5 & 6

MINOR
- 3 ~~major~~ fissure:-

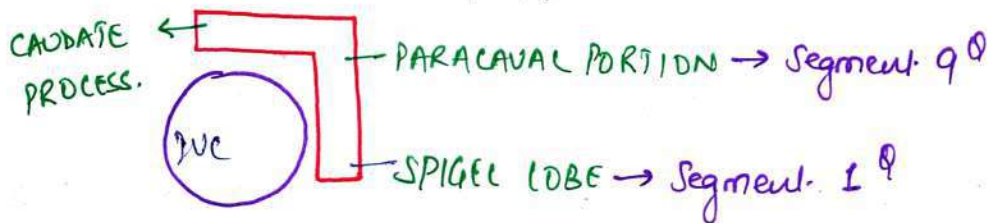
- ① Umbilical fissure
- ② Venous fissure
- ③ fissure of GANIS

AIMS:- In liver there are:- which are in correct:-

- ① 3 Major fissure
- ② 3 Minor fissure
- ③ 4 sectors.
- ④ 8 Segments. ✓

Q
Segment 1:- CAUDATE LOBE
Segment 4:- QUADRATE LOBE

CAUDATE LOBE:-



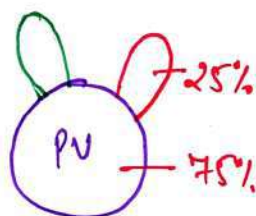
Q:-



*) Caudate lobe: Receive Blood supply from both Rt & Lt branches of Portal vein

- *) It gives its Biliary drainage to both Lt & Rt Hepatic duct.
- *) Venous drainage goes directly to inferior Vena Cava.
- *) In Budd Chiari Synd caused by Hepatic vein thrombosis most of liver is affected but Caudate lobe is spared. in this liver is atrophied but Caudate lobe is hypertrophy.
- *) Early involvement of Caudate lobe in **Hilar cholangio Ca.** occurs. that's why → **ROUTINE CAUDATE LOBECTOMY** performed in Hilar cholangio Ca.

DNB *) **PRINGLEE MANEUVER** AKA (TOTAL INFLOW OCCLUSION)



:- It's placement of clamp @ foramen of Winslow.

- *) It control bleeding from **PV & HA**
- *) It doesn't control bleeding from **IVC & HV.**

*) Bleeding is effectively control from

PV

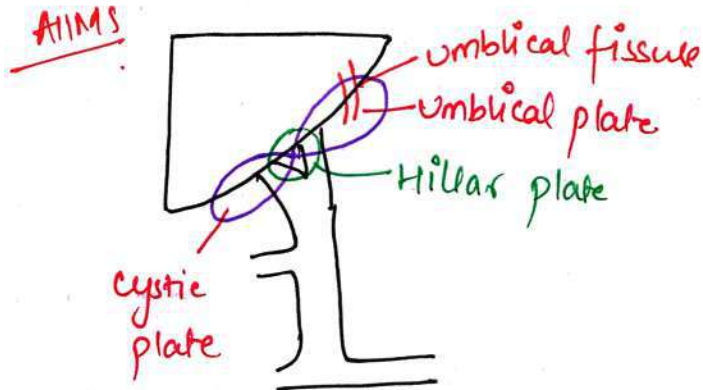
↓

- *) ∴ PV have low pressure

*) Which of the following ^{is not} fascial plate of liver.

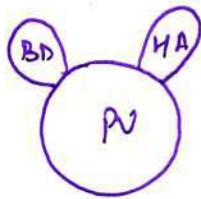
- ① Cystic plate
- ② Portal plate ✓
- ③ Hilar plate
- ④ Umbilical plate

fascial plate :- formed by condensation of Endo-Abdominal fascia.
near inferior aspect of liver



*1) PYOGENIC LIVER ABSCESS:-

- Liver is MC solid organ involved by abscess
- Pyogenic Liver Abscess :- MC type of liver abscess.
 - Male, 5th/6th decades.
 - Alcoholics.



:- MC ROUTE :- BILE DUCT > PV.

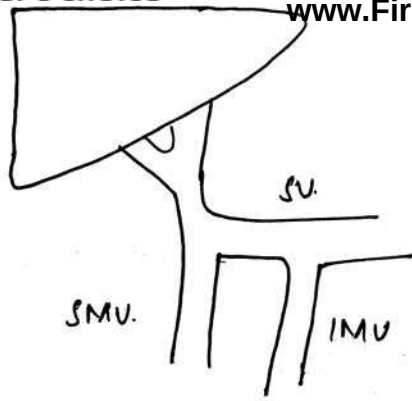
→ MCC :- CHOLANGITIS.

↳ Eska MCC :- CBD stone

→ Western :- cholangiocarcinoma

→ MC organism :- **E. COLI > KLEBSIELLA**





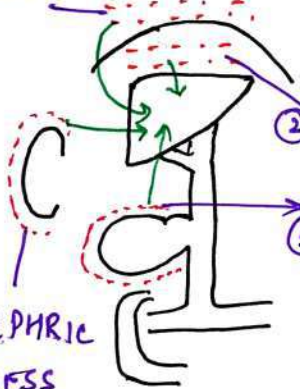
Pyogenic Liver Abscess.

* 3rd ROUTE:- Hepatic Artery :- Imp. ROUTE IN CHILDREN suffering from CHRONIC GRANULOMATOUS D'S.

Organism:- STAPH AUREUS

* 4th ROUTE:- DIRECT EXTENSION OF INFECTION.

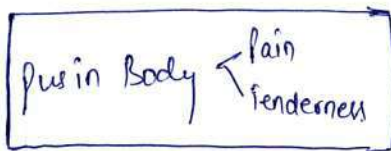
① PYOTHORAX



② SUB. PHRENIC ABSCESS.

③ Ac. Suppurative abscess

④ PERINEPHRIC ABSCESS



Q:- MC organism responsible for pyogenic liver abscess:-

World wide:- E. COLI

ASIA :- KLEBSIELLA

CHILDREN suffering from ch. granulomatous D's
S. AUREUS.

C/f :- MC symptom :- fever & chills & Rigor

Abdominal pain

Anorexia

fatigue.

(PCI) jaundice is common in pyogenic liver abscess (20-25%)

*) MC LFT abnormality:- ALP
in PLA

*) 1st Lx done in suspected case of Hepato biliary pancreato Dis :- USG.

*) Abs is highly suggested by:- USG & CT.

*) Abs confirmed by :- Aspiratⁿ & culture (Doc)

*) Rx of PLA:-



1) percutaneous aspiraⁿ

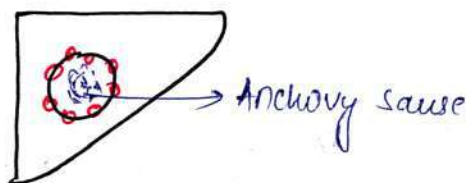
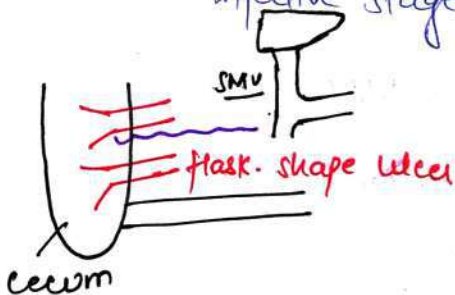
2) percutaneous catheter drainage ✓
+ systemic antibiotic.

3) Doc for follow up of uncomplicated liver abscess:- USG.

*) - AMOEBIC LIVER ABSCESS -

Mcc → ENTAMEBA HISTOLYTICA

- MC in developing country.
- MC in young pt.
- MC Route:- feco-Oral.
- Infective stage:- Quadrinucleate cyst.



- MC site of Amebic colitis:- cecum & Ascending colon & formⁿ of flask shape ulcer

- Collecⁿ of Reddish Brown fluid d/t necrosis of Hepatocyte & WBC :- ~~appear~~ ANCHOVY SAUCE

MC symptoms: Abdominal pain

- 1) fever
- 1) Anorexia
- 1) fatigue
- 1) Jandice is Rare

Lx: 1) 1st Lx done:- USG

1) Abs is highly suggested by:- USG & CT

1) Abs is confirmed by:-

- ① Aspiraⁿ + culture → for pyogenic liver abscess.
- ② Blood culture
- ③ stool culture
- ④ Serology. ✓

1) DxC:- SEROLOGY BY ELISA

Rx: DxC:- HIGH DOSE ORAL METRONIDAZOLE 750mg TDS X 10-14 day.

↓ Pt. become asymptomatic in

3-5 day

↓ Radiological Resolution of Abscess cavity

3-9 months

(∴ do not treat the cavity, treat the pt.)

⑤ Indicaⁿ of Aspiraⁿ :-

① No improvement in 3-5 days

② High Risk abscess :- Size > 5cm

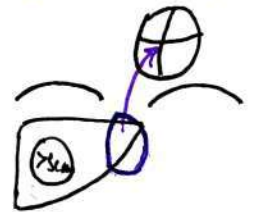
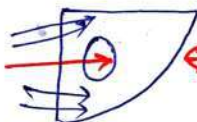
1) Left lobe Abscess.

③ Diagnostic uncertainty

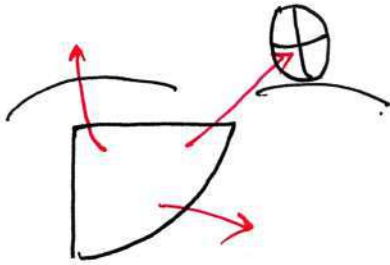
④ 2° Bac. infecⁿ

⑤ Pregnancy (∴ High dose Metronidazole is not indicated)
∴ It's not safe.

SKIN



* site of rupture:-



- MC complicaⁿ:- Rupture into peritoneal cavity > Pleural cavity > pericardial cavity

- Rx of Rupture into peritoneal cavity:- Exploratory laprotomy
⊕
Peritoneal lavage
⊕
Drainage inserⁿ

- Rx of Rupture into pleural cavity:- ICD ⊕ chest tube inserⁿ

- Rx of Rupture into pericardial cavity:- Pericardiocentesis f/b drainage by pericardiectomy

- for asymptomatic cyst passer:- Intraluminal agents given:-

① PAROMOMYCIN

② IODOQUINOL

(PID)

③ DILOXANIDE FURATE

HYDATID CYST

- Zoonoses

- Sheep Grazing area :- Australia, New Zealand, East Africa, South America.

- ECHINOCOCCUS GRANULOSUS

- E. MULTICOLORIS - Responsible for Malignant Hydatosis.

- E. VOSSELI

- E. OLKARTHUS

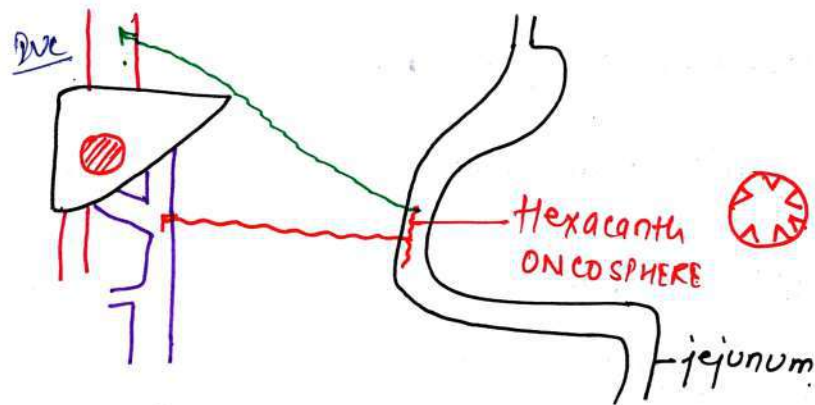
* Definitive Host (sexual phase of cycle occurring) :- DOG

* Intermediate Host :- SHEEP

* Accidental, Dead End, Intermediate Host - Human to human transmission :- MAN

* Route :- feco-oral

* Infective stage :- Eggs of Echinococcus.



* Organ involved :- LIVER > LUNGS > SPLEEN > KIDNEY > BRAIN > BONE

* C/H :- Mostly asymptomatic

MC presentaⁿ :- asymptomatic palpable intra abdominal Mass.

Other :- abdominal discomfort
abdominal pain
dyspepsia

* Exr USG :-



Cyst in cyst :- ROSETTE

CT :-



RING LIKE CALCIFICATION

Loc :- Serology - ELISA

-ARC-S

-Immunoblot

7 } >95% Sensitivity & specificity.

CASONI'S TEST :- SS-60% sensitivity

absolute :-
1) low sensitivity
2) Anaphylaxis

ALBENDAZOLE

MEBENDAZOLE

Advantage:- ① Schollicidal

② shrink the size of cyst

Rx:- ① PAIR - Most preferred Rx for Anatomically & surgically appropriate lesion

② CYST EVACUATION + OMENTOPEXY :- ~~Most Radical Rx~~

③ PERICYSTECTOMY - Most Effective

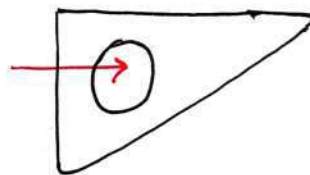
④ HEPATIC RESECTIONING :- Most Radical Rx

PAIR:- 1) Puncture

2) Aspirate of content

3) Instillate of solicidal agent

4) Reaspirate



Sollicidal agent used:- ① HYPERTONIC SALINE (20%) :- MC used

0.9%

3%

5%

10%

20% ✓

Hypertonic Saline in IV :- 3%

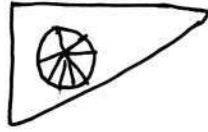
* not used
formaline
silver nitrate

② 0.5% CETRIMIDE & 0.05% CHLORHEXIDINE

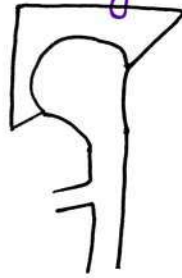
③ ABSOLUTE ALCOHOL

④ 10% POVIDONE IODINE

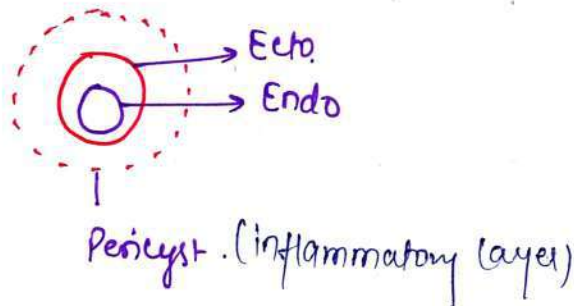
- ① Inaccessible cyst
- ② Peripherally located cyst (∴ Easily Rupture)
- ③ Multiloculated / Multiseptated cyst



- ④ Cysto-Biliary communicaⁿ

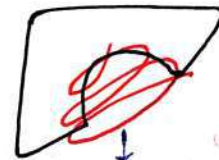
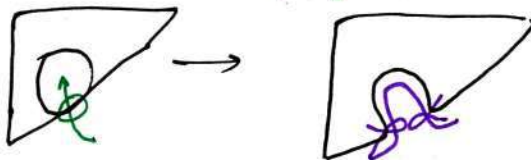


- ⑤ Cyst in Brain & Lungs.

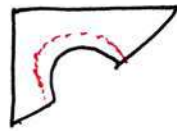


- ⑥ Calcified cyst.

- ② Cyst Evacuaⁿ & Omentopexy :-



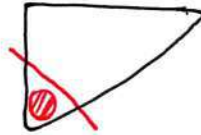
- Obliteraⁿ of cyst cavity & the help of suture by two methods:
- ① Capitonage
 - ② Interplexon.



- Excision of cyst from outside of pericyst-

④ Hepatic Resecⁿ :- Radical

- Reserved for Recurrence cyst-



* GHARBI'S CLASSIFICATION (USG)

I :-



Simple fluid collecⁿ

II :-



floating membrane
undulating
water lily sign
water snake sign

III :-



MULTI-loculated
Multi-septated

HONEY-COMBING :- Hydatid Cyst-

HONEY-COMB LIVER :- ACINOMYCOSIS

IV :-



Complex Heterogenous mass

V



:- Calcified cyst-

Pyogenic ~
Hydatid cyst-

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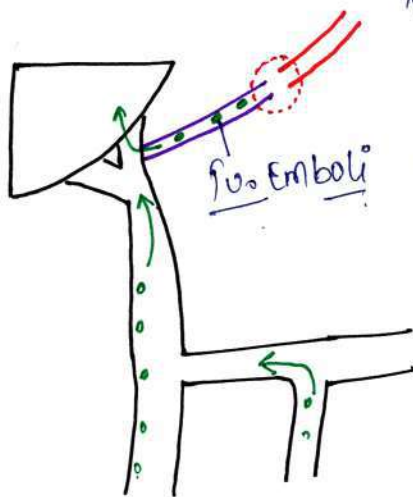
- 1) usually the cavity is single
- 2) Mc involved Rt-lobe
- 3) CXR changes are similar

CXR changes :-

- 1) Atelectasis - collapsed of (R) lung.
- 2) Raised (R) Dome of diaphragm.
- 3) Reactive pleural effusion.

LIVER MALIGNANCY

- 1) Mc Malignancy of liver:- Metastasis.
- 2) Mc 1° Malignancy of liver:- HCC
- 3) Mc 1° Malignancy of liver in children:- Hepatoblastoma
- 4) Mc Benign Tu. of liver :- Hemangioma.



* from Eso- to Ano-Rectal junc.
Tu. spread to liver.

* Any organ out side GIT
eg. Ca. Anus :- lung.

- In GI malignancy having Hematogenous spread (Eso- to Rectum) - Mc site of Metastasis - LIVER

In NON-GI Malignancy having Hematogenous spread - Mc site: Lung

→ Ca. Anal canal, RCC, Testicular Tu., Ca. Penis, soft tissue sarcoma

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1° :- Colo-Rectal Ca > Ca. Lung.

1. MC Malignancy in ♂ :- ^{Incidence} Prostate > Lung > Colon | ^{Mortality} C > P > c

11. $n \quad n \quad n \quad 0 \div \text{Breast} > \text{Lung} > \text{Colon} \mid C > B > A$

III. Overall Mc Malignancy ^{in WORLD} :- LUNG.
(Both in ♂ & ♀)

IV. $n \quad n \quad n \quad n$ τ Mortality:- **LONG**
(♂+♀) **WORLD**

x) Ca. lung is Mc primary for metastasis to

K - Kidney

E - Esophagus.

P - Pancreas

A - Adrenal (MC)

B - Brain

$s = 5 \text{ km}$

*) Mc site of Metastasis from Co. Lung:- Adrenal

*1) n n n n n Small cell lung ca:- BRAIN

⇒ BREAST CA. MC i^o for Metastasis to:-

↑ :- Thyroid

L :- Wong

C :- Leptomeninges.

⇒ Metastasis to heart :-

→ :- CaO lung

♀ :- Ca Breast.

Metastasis to spleen :- Mc :- Malignant Melanoma. (involve multiple organ)

* Mc 1° for isolated 2° to spleen :- Ca. Ovary.

⇒ Metastasis to Testis :- Ca. Prostate

⇒ Metastasis to Penis :- Ca. Bladder

⇒ Mc Malignancy responsible for Bony Metastasis :- Ca Breast > Ca. Prostate.
(Kumbar Vertebra)

⇒ Mc site of Bony metastasis :- Vertebra :- Thoracic Vertebra.

⇒ Mc site of Metastasis in both Ca. Breast & Ca. Prostate :- Kumbar Vertebra

⇒ Mc 1° for both osteolytic & osteoblastic 2° in female :- Ca. Breast

(osteolytic Met than
osteoblastic)

→ " " " " " "

" 2° in Male :- Ca. Prostate

→ Mc Malignancy responsible for osteolytic in Male :- RCC & follicular
Ca. of thyroid also
also pulsatile 2°.

HEMANGIOMA

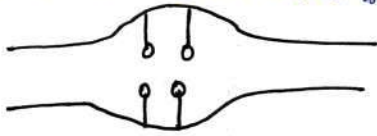
- Mc Benign tumor of liver
- Mc in female, also OCP use.
- Size - small.
- asymptomatic
- Size > 5 cm KIA - GIANT HEMANGIOMA
- Hemangioma ↑ its size by Ectasia (not by Neoplasia)
↳ (dilatation)

*) Incidentally diagnosed on Radiological investigaⁿ.

*) In symptomatic pt. it's also :- Abdominal pain

Abdominal discomfort

*) KASSABACH-MERITT SYND :-



*) Microangiopathic Hemolytic Anemia

*) Thrombocytopenia

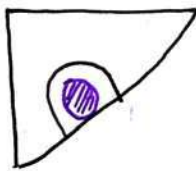
*) platelet trapping

*) Consumptive coagulopathy.

*) **POC for A/s** :- **MRI** :- will get Peripheral Nodular Enhancement KIA **LIGHT BULB APPEARANCE**

FNAC & Bx is CI

*) **ROC** :- **ENUCLEATION**



Enucleaⁿ is POC in

① Hemangioma Liver

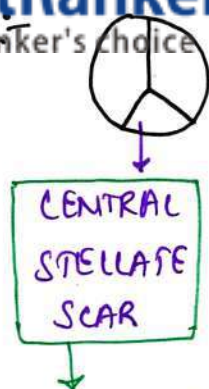
② Leiomyoma Esophagus

③ Insulinoma Head of Pancreas

④ chylolymphatic cyst

FNH :- **FOCAL NODULAR HYPERPLASIA**

- 2nd MC Benign T^u. of Liver.
- MC in female also OCP use.
- Benign & asymptomatic.



seen in:- ① FNH

② fibrolamellar variant of HCC

③ Serous cystadenoma Pancreas.

④ Renal oncocytoma.



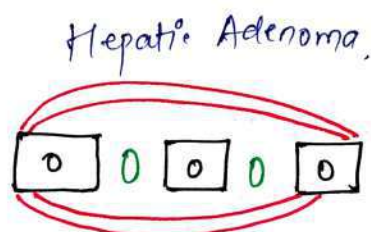
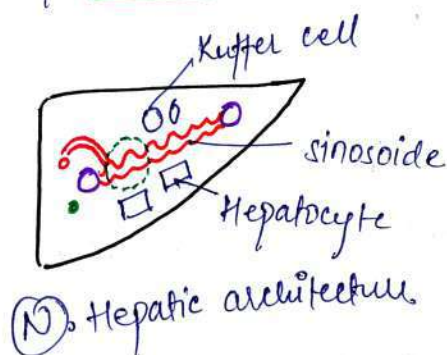
CART WHEEL / SPOKE-WHEEL Appearance

R:- 1) Observation

2) Excision is done in case of diagnostic uncertainty.

3- HEPATIC ADENOMA

- Benign proliferation of Hepatocyte
- Also OCP's, MC in female.
- Also low risk of Malignant transformation into HCC.
- Hepatic architecture is not maintained.



* Presence of cord of Hepatocyte glycogen and fat preferred by poorly supported peripheral Blood Vessels.

DNB → Risk of Rupture in Hepatic Adenoma:- 30-50%
in HCC :- 3-5%

- It's ↑ risk of Haem & Necrosis in the tumor.

Q: asymptomatic

- MC symptom:- abd. pain
- In Emergency $\rightarrow$ pt +ve $\bar{c}$ Hemoperitonium and SHOCK.

Doc:- CECT:- peripheral hypervasculariza?

Rx:- Excision.

Q:- $\leq$ of the following tw. can be diagnosed by Radionuclide Scan.

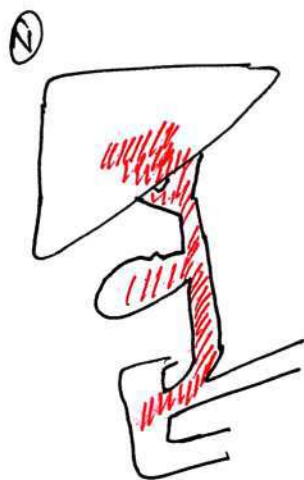
① FNH ✓

② Hepatic Adenoma

③ HCC

④ Metastasis.

∵ FNH is having normal Hepatic architecture
it can be used by Radionuclide Scan (or)
Colloids Scan (or)
Sulphur Scan.



Acute.
Cholecystitis.

Extra Hepatic
Biliary
atresia

① On HIDA Scan (Hepato Biliary Immodiacetic Scan)

:- If non visualizaⁿ of GB $\bar{c}$ in 4hr :- Ac. cholecystitis.

② Uptake of Radionuclide involves $\bar{c}$ out any flow in duodenum :-

Asic:- Biliary Atresia

③ In Budd-chiari synd. caused by Hepatic Vein thrombosis :-

Central HOT SPOT SIGN ON Scintigraphy d/t Caudate lobe
Hypertrophy.

Risk factor:-

① Cirrhosis.

- HBV
- HCV
- Alcohol
- Ch = Active Hepatitis.
- 1° Biliary Cirrhosis.
- NAFLD (Non-alcoholic fatty liver ds)

② Metabolic Disorder

- Hemochromatosis
- Wilson's
- Glycogen storage Disorder
- Galactosemia.
- α_1 -anti-trypsin deficiency
- Citrullinemia
- Porphyria cutanea tarda
- Alagille's Synd Q
aka congenital cholestatic synd.
- Orotic Aciduria Q

③ Environmental factor

- Smoking
- Aflatoxin
- Anabolic steroid.
- THOROTRAST Q

THOROTRAST:- $\uparrow$ risk of

- HCC
- cholangiocarcinoma (Maximum risk)
- Angiosarcoma.
- Hepatic fibrosis.

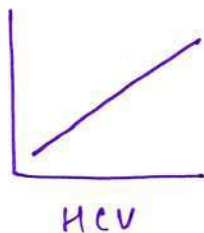
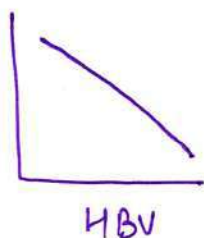
- Maximum incidence in:- 1) ASIAN POPULAN

2) Sub-Saharan Africa

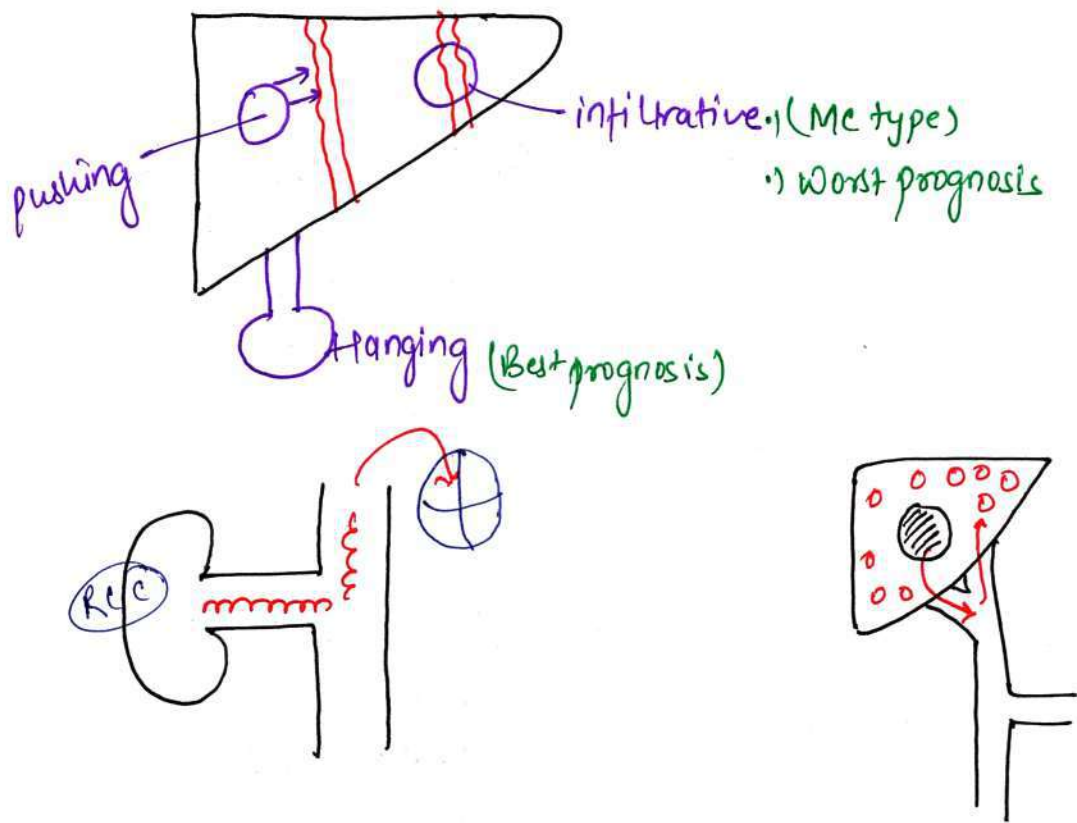
3) MCC:- HBV

Western Countries:- HCV.

HCC:-



* World wide HBV induced HCC is $\downarrow$ sing d/t vaccine? and HCV induced HCC $\uparrow$ sing d/t Blood Transfusion, Sexual Transmission, d/w HIV , any immunocompromised state



5 Major Vein s are Valveless :-

- I :- IVC
- P :- Portal vein
- S - SVC
- B :- Batson plexus
- D :- Dural Venous Sinuses.

C/f :- Mc symptom :- abdominal pain > wt. loss

definⁿ of ^{significant} wt. loss :- 5% in 1 month
 10% in 6 months
 20% in 1 yr

- 1) Anorexia
- 2) fatigue.
- 3) jaundice is seen in 10% case
- 4) Hb. rupture is 25%

↓
Audible Bruit in 25% of cases.

*) MC Paraneoplastic manifestaⁿ also HCC:-

- i) Hypercholesterolemia (MC)
- ii) Hypoglycemia. (2nd MC)
- iii) Erythrocytosis.
- iv) Hypercalcemia.

*) α FP $\rightarrow$ >20 ng/mL in HCC
↓ seen in
70%.

PIVKA-2 $\rightarrow$ Protein induced by Vit.K. Absence of.

Ix:- 1st Ix in suspected case of HCC:- USG

*) Loc:- Triple phase CT:- show arterial hypervascularity & Venous washout.

screening for
*) Loc for High Risk populaⁿ in HCC :- USG

Staging :- OKUDA STAGING:-

B :- Bilirubin

A :- Albumin

f :- Tumor size

A :- Ascities.

CLIP :- G. Liver Italian Program.

*) for HCV induced HCC

P :- portal vein thrombosis

A :- α -F Protein

c :- Child-Turcotte-Pugh score (CTP)

T :- Tumor Extension.

1) for HBV induced HCC

B :- Bilirubin.

A :- '3' :- AFP, Ascities, ALP

T :- TNM stage.

S :- Symptom.

Q Which staging is not used for HCC :-

1) Okuda - Mc used for R

ii) Clp

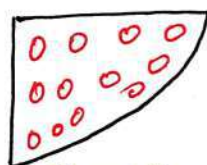
iii) Cupi

iv) WHO ✓

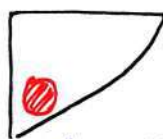
R of HCC is based on BCLC CRITERIA

1) BARCELONA CLINIC FOR LIVER CANCER. CRITERIA

2) Based on OKUDA Staging



Multicentric
Bilobar
↓
75-80%



20-25%
Resectable.

Q Resectable fu. & Adequate Hepatic Reserve > 90% :- Resec?

Q " " " " Inadequate " " :- 90% :- TRANSPLANT

'Transplanta' is based on MILAN's criteria (MAXXAFORU)
for Liver Transplant in HCC:-

① Single fu. < 5cm

② Multiple fu. NO: 2-3, size < 3cm

③ No extra hepatic/vascular spread.

5yr survival >70%.

Q Unresectable T₀:- Palliation.

Q for Advanced & Metastasis HCC $\leq$ drug is used:-

IMATINIB - DOC for CML, GIST

SUNITINIB :- DOC :- ① IMATINIB Resistant GIST

LAPATINIB

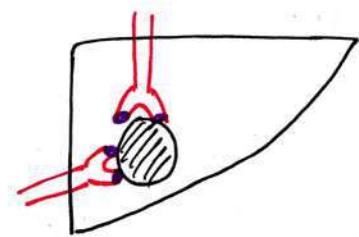
② 1st Line agent for Advanced & Metastatic RCC
③ Refractory & Metastatic Breast Ca.

GEPTINIB :- Adenoca. of lung female & Non-smoker

SORAFENIB :- Advanced & Metastatic HCC.

Method of Palliaⁿ:-

- ① Percutaneous Ethanol Injecⁿ
- ② Percutaneous Acetic-acid injecⁿ
- ③ RFA (Radio frequency ablaⁿ)
- ④ Microwave ablaⁿ
- ⑤ Cryoablation. (liq. N₂)
- ⑥ TACE (Trans-arterial chemo Embolizaⁿ) :- is also improvement of survival.
chemo prophylaxis used $\rightarrow$ L - liver
C - Cisplatin
D - Doxorubicin



- MC 1^o Malignancy of liver in children
- also low Birth wt.
- also FAP :- familial Adenomatous polyposis.
- BWS :- Beckwith-Wiedemann synd. (Wilm's Tu.)
- NOT also :- HBV, HCV, Cirrhosis, Metabolic disorder
- AFP raised :- 85-90%.

Clf :- Most pt. are < 18 months of age

- 1) All pt. are < 3 yr of age
- 2) Mc presentaⁿ :- asymptomatic palpable intraabdominal Mass.
- 3) Mc characteristic lab abnormality :- Very high platelet count.
- 4) Radiological Loc :- CECT
- 5) Loc :- Bx
- 6) Most common site of Metastasis :- Lung.
- 7) Rx :- Resectable Tumor :- Resecⁿ

Q :- 10 months old boy → Hepatoblastoma

on Ix :- Multiple Pulmonary mets.

Prefer Rx :-

- ① Sx only
- ② chemo. only
- ③ Sx + chemo
- ④ chemo + Sx ✓

FIBRO LAMELLAR VARIANT OF HCC

- Well Circumscribed (Non-Encapsulated Tumor)
 - fibrous stroma.
 - lamellar structure.

* AFP - (N)

* Tumor Marker:- Desulphotensin
B₁₂ Binding Globulin

* Not a/w HBV, HCV, Cirrhosis, Metabolic disorder

* Seen in young pts

* In majority of cases:-, Tumor is Resectable.

'Cond'n' of Liver Good

* A/w Good prognosis.

TRANSPLANTATION

- Human Transplantation Act :- passed in 1944
- 1st Renal Transplantation :- MURRAY (1954) (°° of identical twins)
- 1st Liver " :- STARZL
- 1st Heart " :- CHRISTIAN BARNARD
- " LUNG " :- FRITZ DERUN
- " Heart + Lung " :- REITZ & SHUMWAY
- " PANCREAS " :- KELLY & LILLHEI
- ISLET CELL TRANSPLANT :- SUTHERLAND

* Shelf Life Islet cell = 1 Yr

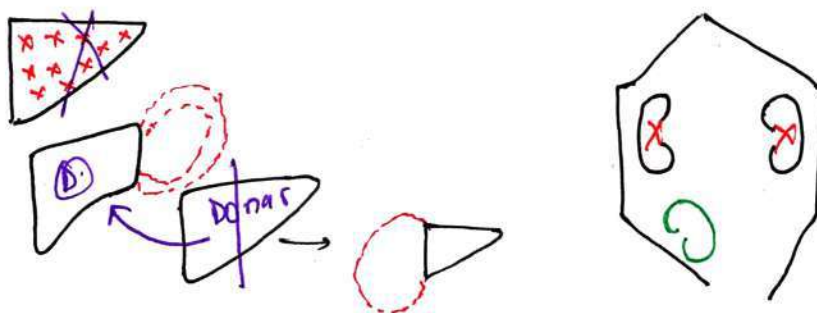
* CONCORDANT XENOGRAFT:- Harvesting Organ from closely Related species to the Human Beings.

* Autograft:- pt. own tissue are used.

* Allograft aka (Homograft):- Graft taken from same species.

* Hetrograft (Xenograft) :- Graft taken from diff. species.

LIVER TRANSPLANTATION:-



* Most of Liver transplantaⁿ are ORTHOTOPIC

* Most of Renal , HETROTOPIC

* In Renal Transplantaⁿ →, Lt. Kidney preferred dlt longer Renal Vein.

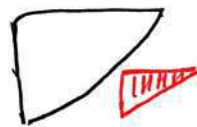
• Graft Kept in RIF

* Total no. of Kidney is 3 in Recipient.

ORTHOTOPIC TRANSPLANTATION:-

Hetrotopic :- placement of graft @ alternative site but not in organ bed

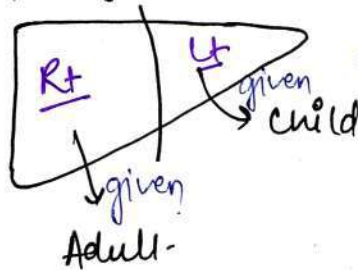
Auxiliary Liver T = placement of graft near organ bed.



APOLT (Auxiliary partial Orthotopic Transplants)

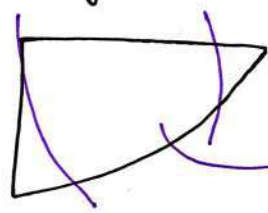
placement of graft @ vacated stage created after excision after left lobe.

Q: Brain dead, 2 Kg Liver



⇒ **SPLIT LIVER TRANSPLANTATION**

Q: Brain dead, 1600gm Liver



REDUCED LIVER TRANSPLANTATION:- size of graft reduced made appropriate to recipient.
Req. 1200gm of liver

Q: Indicaⁿ of APOLT:-

- ① Acute fulminant Reversible Hepatic failure eg:- Acetaminophen toxicity.
- ② Non-cirrhotic Metabolic liver dis
- ③ Small for graft size
- ④ ABO incompatibility.

Most preferred indicaⁿ

Q: MC indicaⁿ of Liver Transplaⁿ:- HCV induced Cirrhosis.

2nd MC " " " " :- Alcohol induced "

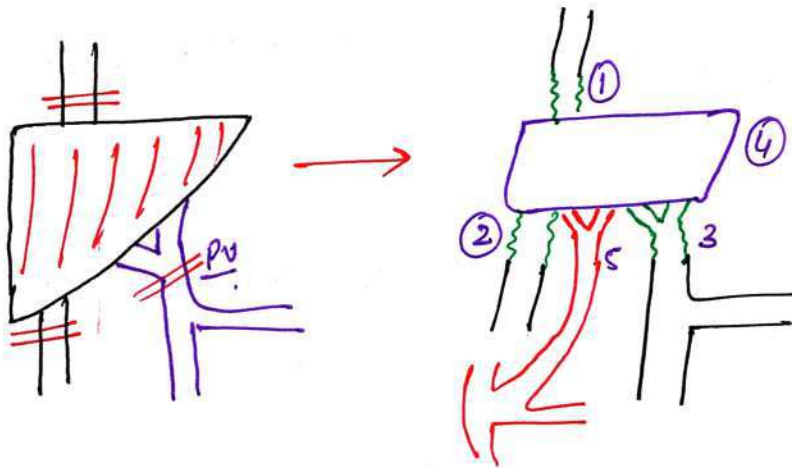
MC indicaⁿ of Pediatric LT:- Biliary atresia

MC Metabolic disorder req LT:- α_1 AT deficiency.

MC indicaⁿ of LT following Ac. Hepatic failure:- Aceta-aminophen Toxicity.

SIPH-B :-

- ① Suprahepatic IVC
- ② Intrahepatic IVC
- ③ Portal vein
- ④ Hepatic artery
- ⑤ Bile duct



* during Transplant :- choledochcholeostomy is preferred over choledochcho-jejunostomy.

* Indicaⁿ of choledochchojejunostomy :-

- ① ^{Disproportion} ~~disproportion~~ in size b/w Donor & Recipient Bile duct.
- ② D's Recipient Bile duct (i.e 1^o sclerosing cholangitis)

* Organ allocaⁿ (Liver Graft) in Adult Based on MELD SCORE

(Model for End stage Liver D's)

Component of MELD

C :- Creatinine

B :- Bilirubin

I :- INR

N - Nutriⁿ

A - AGE

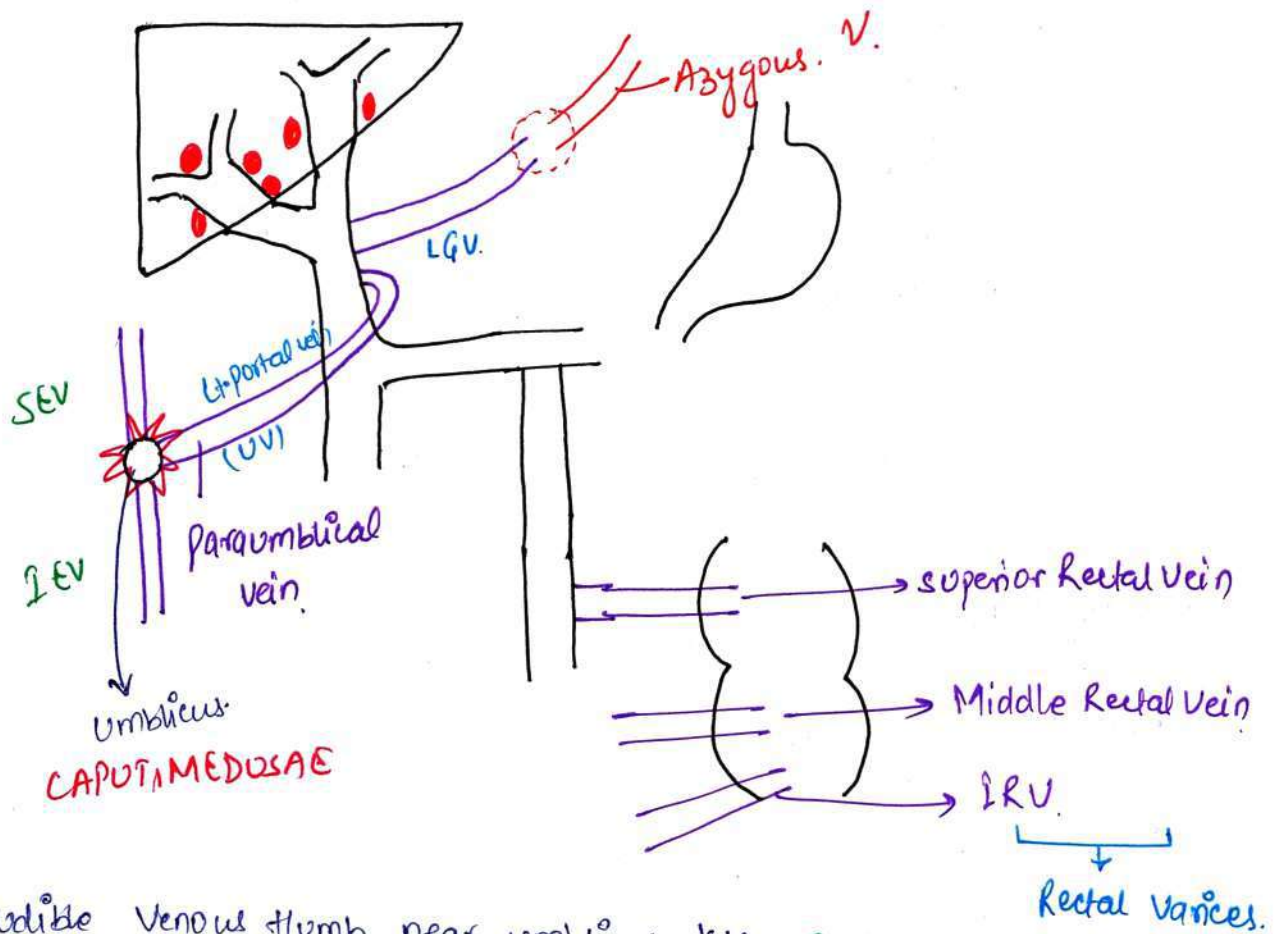
B :- Bilirubin

I :- INR

A :- Albomin

PORTAL HTN

- 1) ① Portal pressure :- 5-10 mmHg (10-15 cm of saline)^o
- 2) portal HTN > 10 mmHg
- 3) 2 universal manifestⁿ of portal HTN :-
 - 1) Splenomegaly.
 - 2) Esophageal Varices :- It's formaⁿ begins @ pressure > 10 mmHg
 - variceal
 - 3) Esophageal bleeding occur @ pressure > 12 mmHg
- 4) for HTN two factors are responsible :-
 - 1) ↑ Resistance
 - 2) ↑ flow
- 5) HTN is state of Hyperdynamic Circulaⁿ → That's why β-Blocker ↓ mortality
 - 1) In systemic HTN.
 - 2) ↓ Risk of Bleeding from varices in portal HTN.

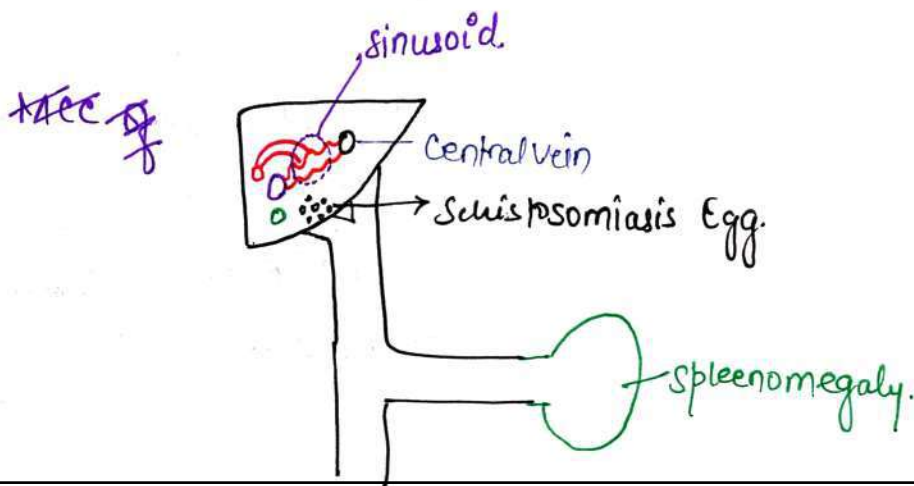


* Audible Venous hum near umbilicus K/A **CRUELHIER** ~~BAUMGARTEN~~
BAUMGARTEN

* Mcc of Portal HTN in Adult:- **Cirrhosis**

* " " " " Children:- **EHPVO** (Extra Hepatic portal venous Obstruction)

* Mcc of death in Cirrhosis who's having Portal HTN:- **Hepatic failure**
Variceal Bleeding



*** Pre sinusoidal Extra Hepatic :-**

- I) Splenic Vein thrombosis
- II) Splenic arterio-venous fistula.
- III) Splenomegaly

*** Pre-sinusoidal Intra Hepatic :-**

- ① Schistosomiasis (MC)
- II) Sarcoidosis
- III) Graft vs Host D's
- IV) Nodular Regenerative Hyperplasia.

*** Sinusoidal :-**

- I) Cirrhosis caused by :- HPV, HCV, ALCOHOL
- II) 1° Biliary cirrhosis

*** Post Sinusoidal Intra Hepatic :-**

- I) VOD (Veno-occlusive D's)

*** Post Sinusoidal Extra Hepatic :-**

- I) Budd chiari synd
- II) IVC Obstruction
- III) Rt. Sided HF
- IV) Constrictive pericarditis.

STEPS OF Mx of Variceal Bleeding.

① Put 2 large bore IV cannula

- ↓
- Start IVF - fluid of choice - RL
- cut off BP :- 100 mmHg
- cut off Hb :- 9 gm%

↓

*) Stop the Bleeding :- DOCT OCTERIODIDE > TERLIPRESIN + NITRATE

↓
cause intense Vasospasm. therefore
add.

*) Gastric Lavage performed w Room temp saline

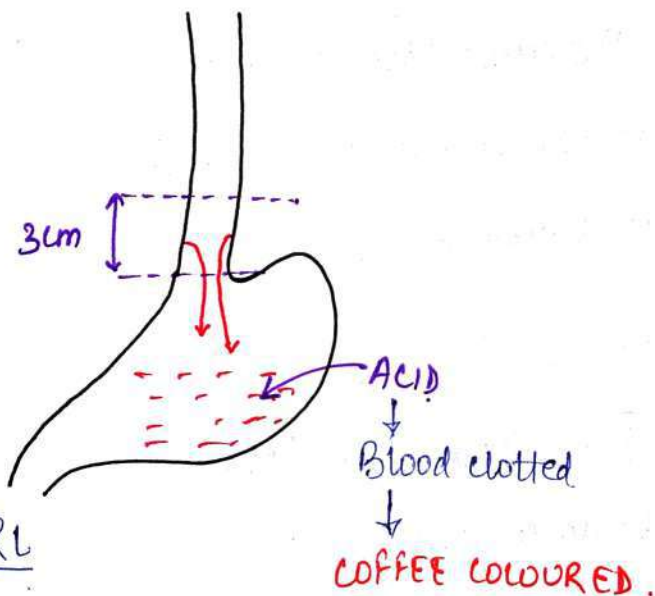
*) Cold Saline not used ∵ it can lead to Reversible platelet dysfunction.

↓

*) Preferred option for Variceal Bleeding :- Endoscopy Variceal Liga.

*) Endoscopy sclerotherapy is easy to perform but it is also ↑ risk of complicaⁿ like Esophageal perforaⁿ

*) IV Prophylactic antibiotic given to all pt. & decreases ↓ risk of infecⁿ
↓ duraⁿ of Hospitalizaⁿ
↓ Risk of Re-bleeding.



* If 2 attempts of Endoscopy are not able to control Bleeding

Sp interveⁿ :-

1) TIPS

2) SHUNT slb performed.

* SENGSTAKEN BLAKEMORE TUBE :- It's Double balloon triple layer tube used to control Variceal Bleeding during Transports.

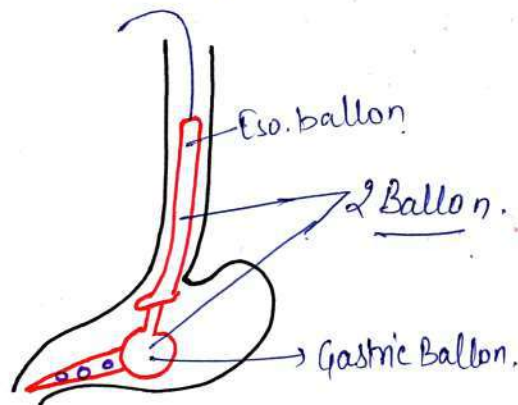
- Mc complicaⁿ of Insertion :- Aspiraⁿ

↓ That's why

Airway slb protected before insertion.

- For inflation of balloon :- Only 'AIR' used

*) Use of water, saline & contrast is C/I.



Q :- Minimum amt. of air used for inflating gastric Balloon → 300 ml

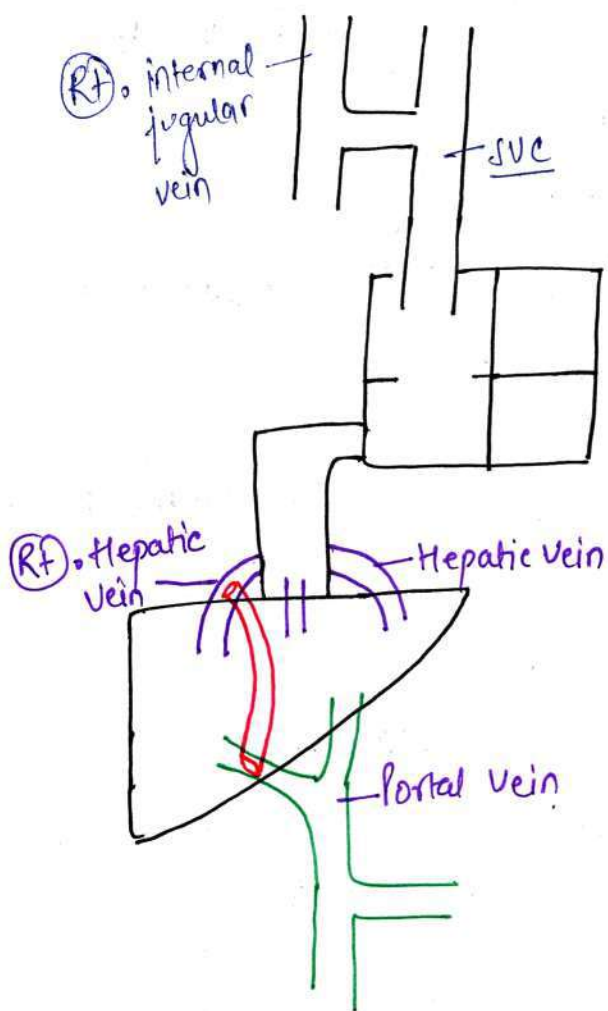
Q :- Maximum pressure exerted by Esophageal balloon :- 35-40 mmHg

Q :- Esophageal balloon deflated after Every 12hr to prevent ischemia and perforaⁿ of Esophagus.

Transjugular Intrahepatic Portocaval Shunt -

Non Selective Shunt.

- 1) Stent is inserted b/w (R) Hepatic Vein & (R) Branch of portal vein.
- 2) Name of stent :- **VIAFOR**
- 3) Preferred vein for cannula :- (R) internal jugular vein
- 4) for cannula of portal vein :- **Rosch Needle** is used.



1) MC S/E (C) complications :-

- 1) Encephalopathy, d/t Ammonia ↑ in Blood.
- 2) STENT Stenosis & Stent thrombosis.

2) C/E :- Absolute &

- 1) R/Sided HF
- 2) Pulmonary HTN
- 3) Hepatopulmonary synd.*
- 4) Polycystic Liver D's.

RELATIVE C/E :-

- 1) Portal Vein thrombosis
- 2) Hypervascular live D's.
- 3) Encephalopathy.

* Indicaⁿ of TIPS :-

- 1) Prevenⁿ of Re-Bleeding from Varices (MC)
- 2) Acute Variceal Bleeding
- 3) Refractory ascites.
- 4) Refractory Hepatic hydrothorax
- 5) Hepatic Reg. Synd.*
- 6) Budd Chiari synd.
- 7) Veno-occlusive d's.
- 8) Portal Hypertensive Gastropathy.

I) Non-Selective

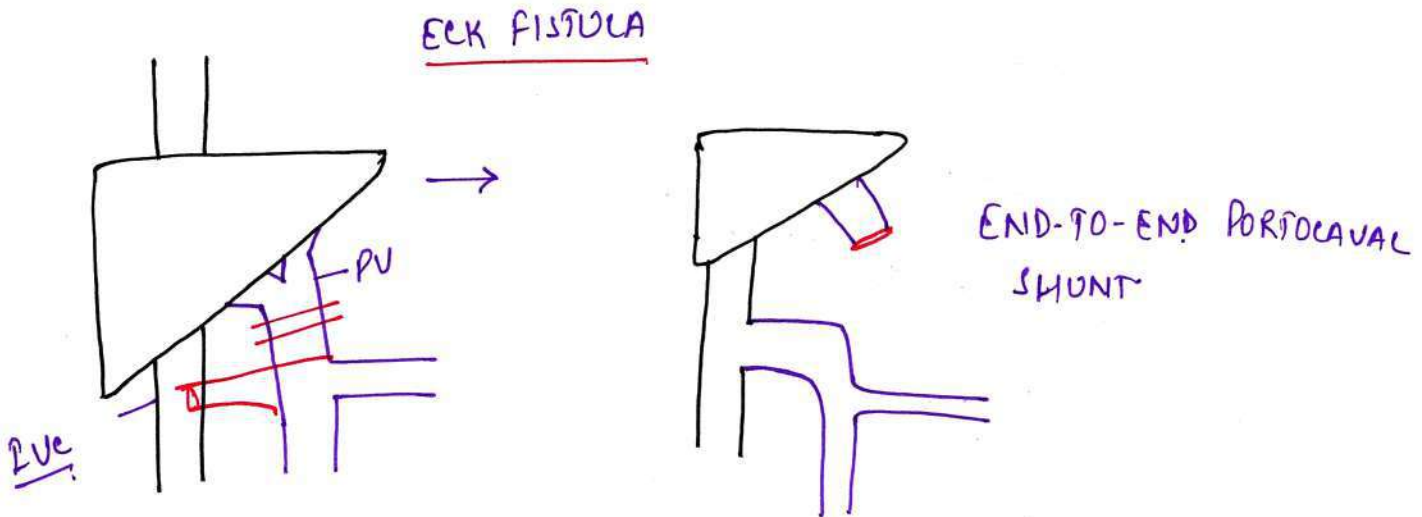
-) ECK FISTULA
-) Side to Side portocaval shunt (SSPCS)
-) Interposition Graft:-
 - Portocaval
 - Mesocaval
 - Mesorenal
-) Proximal spleno renal shunt (PSRS)
aka (CLINTON'S SHUNT)

II) Selective

-) Distal spleno renal shunt (DSRS) (Warren)
-) INOKUCHI SHUNT

III) Partial Selective

-) Diameter < 10mm.

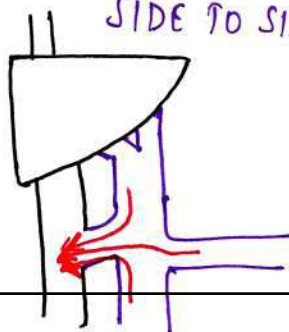


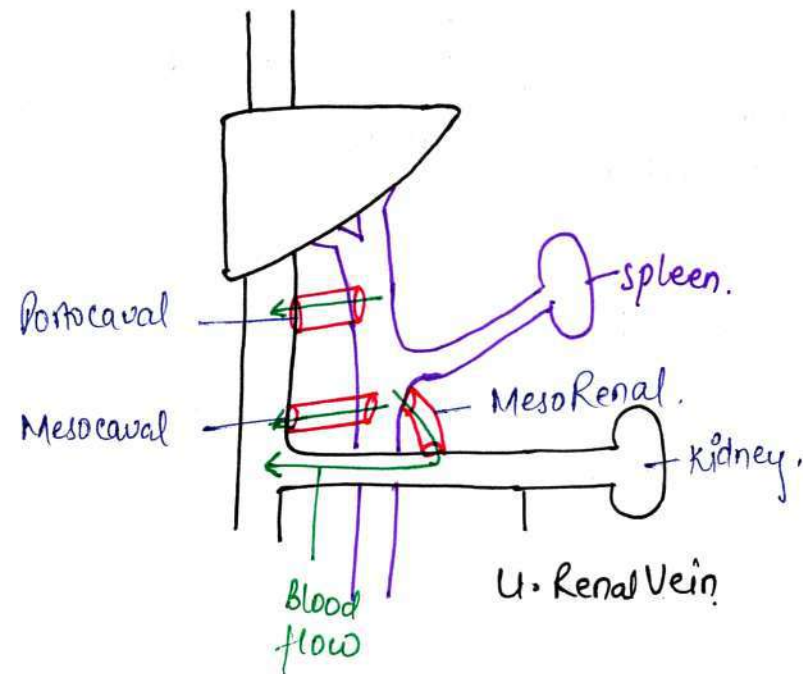
*) ↑ risk of Hepatic Ischemia → Have historical importance
Now its obsolete

SIDE TO SIDE PORTOCAVAL SHUNT: (SSPCS)

- MC performed world wide
- Done for:
 - ① Budd chiari synd.
 - ② VOD
 - ③ Refractory ascites.

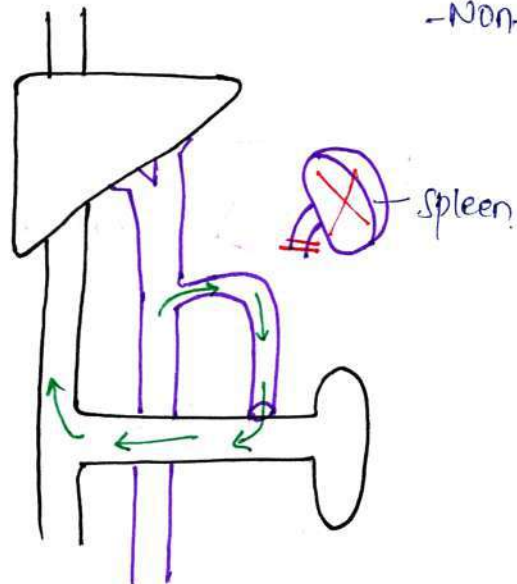
} Shunt of choice



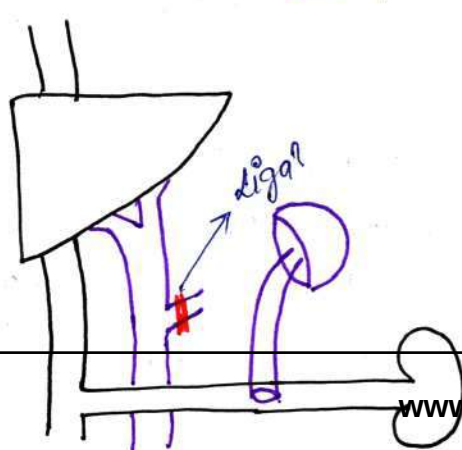


PROXIMAL SPLENO RENAL SHUNT (PSRS) (LINDON'S SHUNT)

- Non Selective



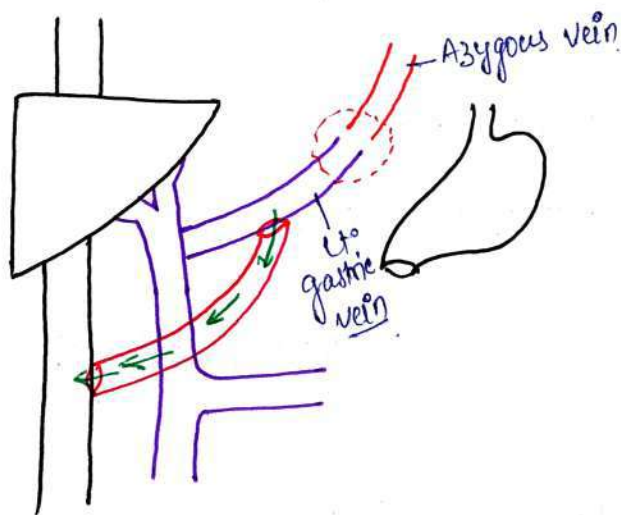
DSRS (WARREN SHUNT)



I :- Interposiⁿ Graft- B1w
↓

V :- Vena Cava

C :- Coronary Vein (Lt. Gastric Vein).



Peritoneo Venous Shunt :- 3 Shunts.

① LE-VEEN

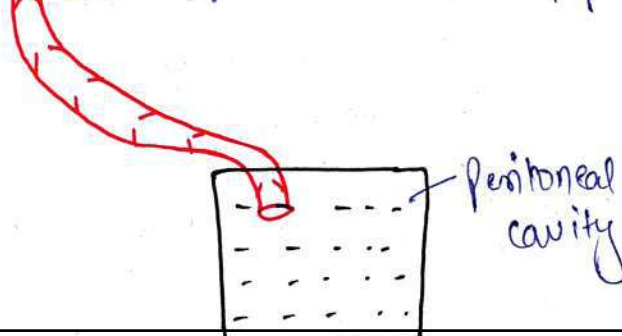
② DENVER

③ MINNESOTA

Indicaⁿ :- Refractory Ascites .



One End @ Peritoneal cavity and another End is @
Rt Internal jugular Vein > Superior Vena Cava



NON-CIRRHOTIC PORTAL HTN

2 type :-

- i) EHPVO
 - ii) NCPPF
-
- ① Variceal Bleeding - Mc present?
 - ② splenomegaly.
 - ③ Both are not also sign & symptoms of Hepatic failure like:-
 - o Ascites.
 - o jaundice
 - o Encephalopathy.

EHPVO



- o Mc site of EHPVO is confluence
- o involve 1st & 2nd Order Branches.
- o Seen in 1st & 2nd decade.

- Splenomegaly is less common
But - Mild to Moderate Splenomegaly

NCPPF (Non-cirrhotic portal fibrosis)

- No Bridging fibrosis.
- There is Portal and Periportal fibrosis.



- o involve 3rd & 4th Order Branches.
- o 2nd - 4th decade
- o Exposure of
 - U - VINYL CHLORIDE
 - A - ARSENIC
 - C - COPPER

o splenomegaly More common & that's Moderate to severe Splenomegaly

o Mild Splenomegaly (palpable) (< 5cm from costal margin) s/b included in EHPVO

o Splen moderate splenomegaly (o) spleen palpable ≥ 5 cm from 4th Costal Margin included in NCPPF

fact to solve Que

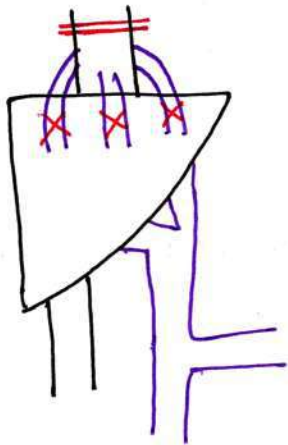
Characterised by :- Hepatic Venous outflow obstruction? caused by Hepatic vein thrombosis (or) IVC obstruction?

- Virchow's triad :-

- i) Stasis
- ii) Endothelial injury.
- iii) Hypercoagulable state.

- MC Etiology for Budd Chiari :- Polycythemia Vera

- India, China, Japan, South Africa :- Membranous obstruction of IVC is MCC



Δ Budd Chiari synd :- ASCITES + HEPATOMEGALY + ABDOMINAL PAIN (ASHA)

Clf :- i) Tender congestive hepatomegaly

ii) Abd. pain

iii) Ascites

iv) jaundice

v) Encephalopathy

vi) Anorexia

vii) fatigue

viii) Lower limb edema is characteristically seen in IVC obstruction?

Doc :- i) VENOGRAPHY

ii) VENACAVOGRAPHY



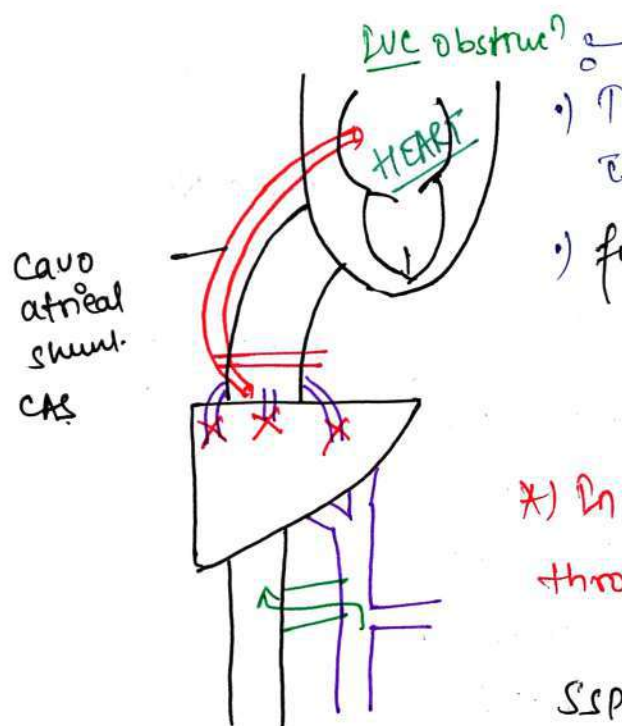
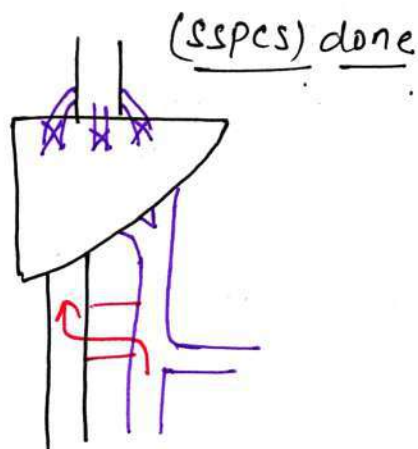
*) On Venography

Spider web collateral seen

Berge's Asis :- On Angiography
 $\downarrow$
 CORIC - SCREW
 collateral

Central Hot spot sign seen on Scintigraphy.

Mx :- Thrombectomy / Thrombolysis s/b attempted if pt. comes in window period.



1) TRANSCARDIAC MEMBRANOTOMY & ANGIOPLASTY

2) for severe stenosis :-
Excision of stenosed segment.
& Grafting.

* In case of Hepatic Vein thrombosis + IVC obstructed



SSPCS + CAS

* Pt. with Hepatic failure :- KOC :- LIVER TRANSPLANTATION.

- Hepatic Venous Outflow Obstruction due to Endothelial Sclerosis of Sublobular Hepatic Veins & venules.

- MCE in Western Countries :- Bone Marrow Transplantation

① Chemotherapy agent Like :- CYTRABINE
OZOGAMULIN
GEMTUXUMAB

② IMMUNOSUPPRESSIVE AGENT :- AZATHIOPRINE

③ BUSH-TEAS → PYRROLIZIDINE ALKALOIDS.
CROTOLARIA, SCENACIO Plant

* Δ :- T :- Tender congestive Hepatomegaly,

H :- Hyperbilirubinemia

R :- Retention of fluid.

also :- Ascitis

jaundice

Encephalopathy.

Lower limb Edema not seen.

Loc :- BIOPSY

a) RxC :- Side to Side portocaval shunt.

1) In Hepatic failure :- RxC :- LIVER TRANSPLANT

DEFIBROTIDE :- used in VOD & improves the survival.

GIT layer :-



* Auerbach plexus :-

funcⁿ :- peristalsis.

Locaⁿ :- B/w Inner circular & Outer longitudinal.

* Strongest layer of GIT :- Submucosa.

* Catgut prep. from Submucosa of SHEEP ILEUM.

* Esophagus :- NO serosa, NO villi, NO secreⁿ, NO Meissner plexuses.

*) ~~topographical~~ Unique feature :- presence of lymphatic in lamina propria.

* GB :- 2 layer absent :- Muscularis Mucosa

*) Submucosa.

That's why GB ca. has poor prognosis.

Q Maximum absorptive capacity per unit surface area :-

I) Duodenum

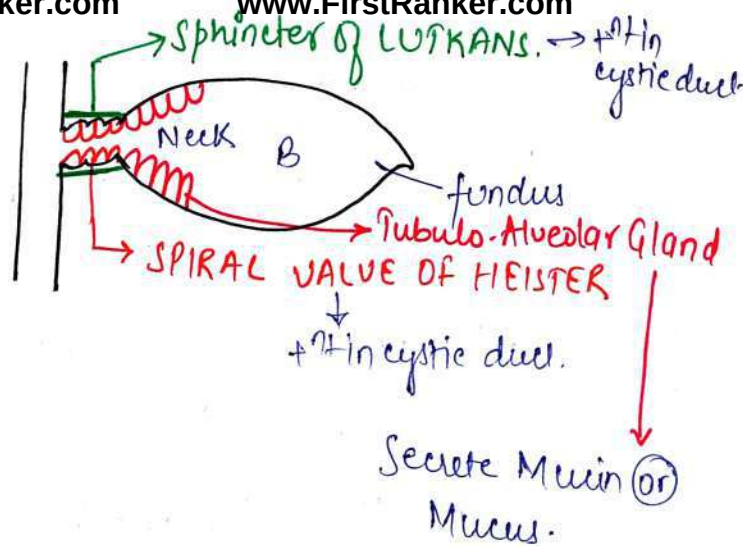
II) Jejunum $\rightarrow$ Maximum absorptive capacity :- jejunum

III) GB ✓

IV) Ileum

V) Colon

- Color:- Sea-Green
- Shape:- Peariform
- Content:- 30-50mL
- Lining:- Tall columnar Epithelium
- funcⁿ:- Storage
 - 1) Concentraⁿ → 5-10 times.
 - 2) Acidificaⁿ of Bile



CHOLESTROL GALL STONE:-

* Composiⁿ of Bile:-

- 1) 85-90% water
 - 2) Cholesterol
 - 3) Bile acid.
 - 4) Lecithin.
- These three components (Cholesterol, Bile acid, and Lecithin) form Micelle formaⁿ.

* factor for GB stone formaⁿ:-

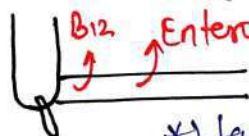
- 1) Lithogenic Bile
- 2) Nucleaⁿ
- 3) Stasis of GB

→ Lithogenic Bile:- ① Super saturaⁿ of cholesterol →

- 1) High fat diet
- 2) Obesity
- 3) CHLORFIBRATE THERAPY

② Deficiency of Bile acid.

Enter Hepatic Circulaⁿ of Bile acid.



* factor Responsible :-

- 1) Ileal d's
- 2) Ileal Resecⁿ

- CYP7A.1 mutaⁿ

② Lecithin deficiency :- MDR-3 gene Mutations.

② Nucleaⁿ :- Pronucleating factor

① Inteeⁿ

② Mucin Glycoprotein

③ Stasis of GB :-

- Prolong fasting

- Prolong TPN (Total parenteral nutrition) Requirement.

- Pregnancy

- OCP

- Octreotide

- Massive BM,

PIGMENTED STONES

BLACK

- Insoluble Bilirubin pigment polymer of Calcium phosphate & Calcium Bicarbonate.

- Radio Opaque

- Hard.

eg. • Hereditary spherocytosis

- Sickle cell Anemia

- β -thalassaemia.

- Prosthetic Heart Valves.

BROWN

- Composed of Calcium bilirubinate, Calcium palmitate, Calcium stearate.

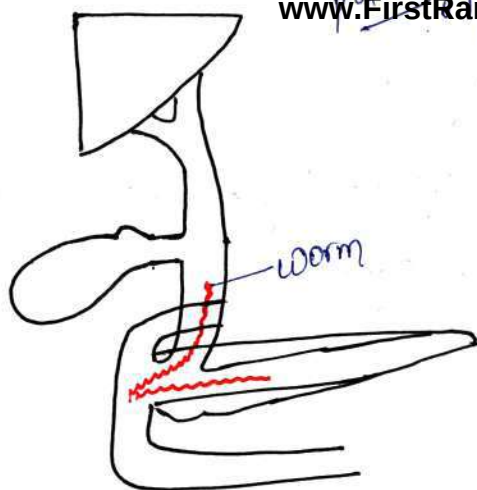
- MC in CBD

- Developing country

- Worm infestaⁿ ↑ the Risk:-

- Ascariis

- Clonorchis Sinensis.



Dead product of Ascaris & Clonorchis
Sincere's
↓ LIF
Infectⁿ by E. coli & Klebsiella
↓ produce
β-Glucuronidase
↓
Conjugated Bilirubin → Unconjugated Bilirubin
↓
BROWN Stone

* MC type of GB stone :- WORLD :- **Cholesterol (MIXED)**

" " " " " INDIA :- **PIGMENTED**
(ASIA)

MC stone in India :-
Q:- Cholesterol (2nd Best)

BLACK

BROWN

PIGMENTED ✓ (Combined incident of Black & Brown)

boxed: pigmented > Mixed > Cholesterol

Q:- On plane X-ray :-



MERCEDES BENZ
SIGN
Tri-radiate



SEA-GULL SIGN
Bi-radiate

* DOC for GB Stone :-

Ac. cholecystitis

Ac. calculous cholecystitis

Ch. cholecystitis

* GOLD Std. Dx

Ac. cholecystitis :- HIDA SCAN

USG

* fed, fertile, flatulent, female, forty c/o

1) Pain in RUQ / Epigastrium after fatty food. → **Biliary colic**

• precipitated by fatty food.

• Duration: 4-6 hr

• Relieved on its own.

11) Ac. cholecystitis:-

Δ:- RUQ pain

• fever

• leucocytosis.

• Minimum duration:- 24 hr

• Not Relieved on its own.

• **MURPHY SIGN**:- (AKA) (NAUNYN'S SIGN):- Catch in inspiral on pressing tip of 9th costal cartilage

• **BOA'S SIGN**:- Hyperaesthesia @ inferior angle of R Scapula.

• **TOKYO GUIDELINE**:- used for assessment, severity, Management of acute cholecystitis and ac. cholangitis.

• **Doc for Δ of Ac cholecystitis**:- USG

Gold std:- HIDA

• **Rx**:- pt. present in 72 hr. :- Rx:- Conservative Mx f/b in hospital / same sitting cholecystectomy.

• **(II)** >3 days of attack → Rx:- Conservative Mx f/b interval Lab. cholecystectomy (after 4-6 wk).

Complication of Gallstone:-

GB

- Asymptomatic
- Ac. cholecystitis.
- Ch. "
- Mucocele
- Empyema
- Necrosis
- Perfora?
- Ca. GB.

CBD & PANCREAS

- Jaundice
- Acute Pancreatitis.

Small intestine

Gallstone Ileus.

* Acalculus cholecystitis:-

1) Inflamaⁿ of GB in absence of stone

2) Two factor $\perp$ are contributory:-

i) GB stasis

ii) Ischemia.

3) Predisposing factor:-

- i) Prolonged fasting
- ii) Prolonged TPN requirement
- iii) Prolonged Hospitalizaⁿ
- iv) Prolonged ICU stay.
- v) Long duraⁿ Sx (CABG, Total-Hip Replacement)
- vi) Massive Burn.

vii) Malaria > Dengue is more common in Acalculus cholecystitis.

viii) Bacteria :- S - Salmonella, Streptococci

U :- Leptospira

V :- Vibrio cholera.

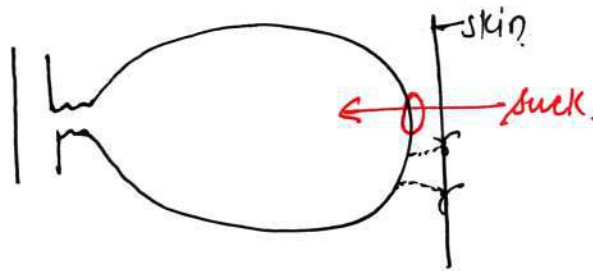
* Clf: pt. + H⁺ E Sign & Symptom of Ac. cholecystitis.

* IOC: USG.

* Gold std. for Δsis: HIDA Scan.

* RDC: Lap. cholecystectomy.

• RDC for unstable pt: Percutaneous cholecystostomy.



• MC Organism Responsible for Emphysematous cholecystitis:-

C. Perfringens / *Welchi* (Anaerobes)

E. coli :— (Aerobes)

• MC Organism responsible for Emphysematous Pyelonephritis :- *E. coli*

• " " " " Xanthogranulomatous pyelonephritis :- Proteus

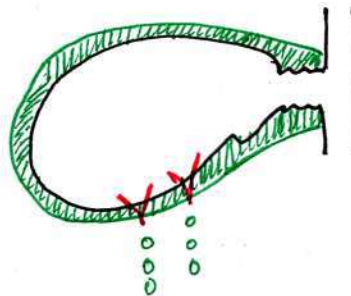
• " " " " (Stagnant Calculi)

Cholecystitis:- Non-infectious



ROKITSANSKY-ASCHOFF
SINUSES. Rupture.

↓
Leak of Bile



UDCA :- Ursodeoxycholic acid
CDCA :- Chenodeoxycholic acid

MDA → 1) HMG- Co-A Reductase (RTE of cholesterol synthesis)

2) Dispersion of cholesterol from stone by physico-chemical Means.

Indica:- ① cholesterol stone

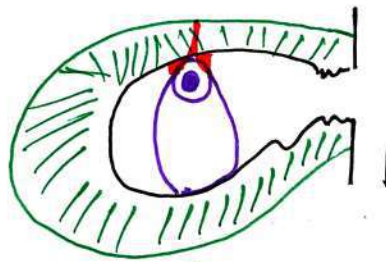
② Size < 1cm

③ functioning GB

④ Non-acute Symptoms.

* ADENOMYOMATOSIS :-

Hyperplastic changes in the Muscularis ~~in~~ Hyperproliferation of Mucosa.



USG:- Diamond Ring sign
Comet-Tail artefact
'V' shaped artefact.

Rx:- Lap. cholecystectomy in symptomatic pt.

* STRAW BERRY GB (Cholesterosis)

→ Cholesterol ester + Triglyceride → Epithelial Macrophage of GB.

→ It's seen in pt. having → hypercholesterolemia

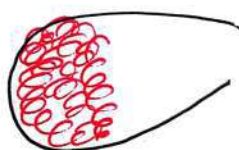
→ Mostly :- cholesterol Gall stone.

→ Gross app:- Yellowish deposit under reddish background / Greenish background.

Rx:- Lap cholecystectomy in symptomatic pt.

Cholesterol Polyp

- More common
- Small in size
- Multiple
- Benign
- Pedunculated



Adenomatous Polyp

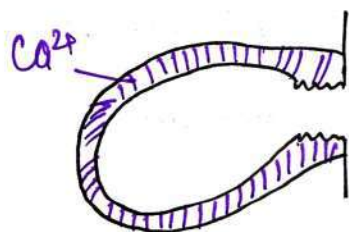
- Less common
- Large
- Single
- Premalignant
- Sessile

* $\uparrow$ Risk of invasive Ca. in GB Polyp (Adenomatous Polyp) :- if :-

- ① Age > 60 Yr
- ② Presence of Gall stone
- ③ Size of polyp > 1 cm
- ④ Documented $\uparrow$ in size on Repeated Scan.

PORCELAIN GB aka Calcified GB:-

- Extensive Calcium Encrustation in the GB wall.



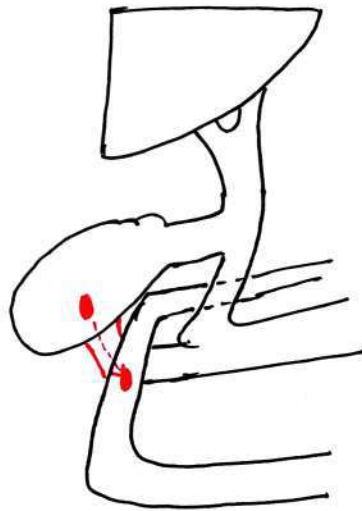
- Bluish app.
- Brittle on cutting

- 5th - 6th decade
- also Gallstone in $> 90\%$ of case.

- Usually asymptomatic
- 1) on radiological Ix:- found Procelain GB.
 - 2) It is also 10% Ca-GB
 - 3) Rx:- Early Lap. Cholecystectomy.

GALL-STONE ILEUS.

- 1) Mc site of fistula:- cholecysto-duodenal fistula.
- 2) 6-7th decade
- 3) also single large stone
- 4) pt. are asymptomatic



REGIER'S Δ:-

Small Bowel obstructⁿ (SBO)

⊕

Pneumobilia

⊕

Ectopic Gall stone.

* Mc site of (SBO) :- Terminal ileum.

* Δs made by:-

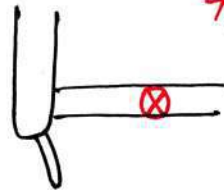
1) Clinical finding

+

X-ray

+

USG.



↑ Oc:- 1) Removal of obstructⁿ only ✓

2) Removal of obstructⁿ + cholecystectomy - NOT done usually.

≠

It can be performed only when pt. is Young & Stable.

- (i) HCC
- (ii) Ca. GB ✓
- (iii) CholangioCa.
- (iv) Ca. pancreas.

* In all GI malignancy and most of Hepatobiliary tract Malignancy smoking is Rlf except Ca. GB

* Rlf :-

- i) Choledochal cyst
- ii) GB stone > 3cm
- iii) Obesity
- iv) ch. typhoid Carrier
- v) 1° Sclerosing cholangitis.
- vi) Adenomatous Polyp.
- vii) Porcelain GB.

* Maximum incidence seen in India > Pakistan
↳ UP & Bihar

i) female 6th | 7th decade.

ii) 75-95% Ca GB Have → Gallstones

iii) 0.3-3% pt. of Gallstone → Ca. GB. (that is all GB stone are ^{not} risk of Ca. GB)

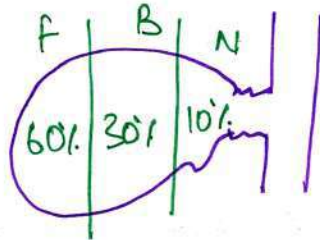
* Similarity B/w Ca. GB & cholangio Ca :-

- (1) AdenoCa.
- (2) Non-specific Marker :- CEA
- (3) Specific Marker :- CA 19-9.
- (4) chemo therapy Regimen :- GEMCITABINE + CISPLATINE

① Histological type:-

- ① diffuse infiltrative / sclerosing :- Mc & worst prognosis
- ② Nodular
- ③ papillary (Best prognosis)

Site of Ca. GB :-



Route of spread → Direct Invasion.

Mn :- H > L > P

Hepatic > Lymphatic > Perineural



IV_b & V :- involved @ early stage

↓

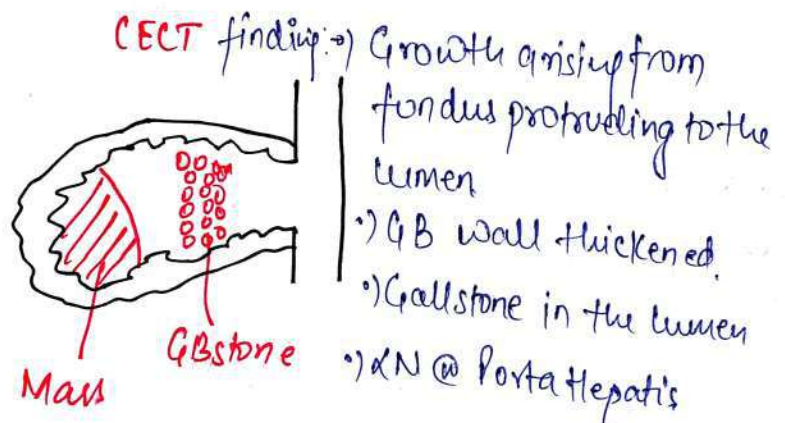
Routinely Removed During Extended cholecystectomy

Clt :- Long History of Repeated attack of Biliary colic & ↑ frequency of attack, ↑ severity of pain & Sudden change in character of pain (persistent dull ache pain) also Anorexia & wt. loss.

* On palpaⁿ :- GB replaced by mass & is hard & nodular

* 1st Lx :- USG

* 2nd Lx :- CECT



T1a:- Involvement of lamina propria.

T1b:- Involvement of Muscularis propria.

T2A:- Involvement of Perimuscular connective tissue towards Peritoneal side cont Serosal Perfora?



T2B:- involvement of Perimuscular connective tissue towards Hepatic side cont direct Hepatic Invasion.

T3:- Serosal perfora? OR Direct Hepatic Invasion OR Inv. of single Extra-Hepatic organ.

T4:- Inv. of portal Vein OR Hepatic artery OR two OR more Extra-Hepatic artery.

N1:- Metastasis to 1-3 LN

N2:- Metastasis to 4 OR more LN

M0:- No metastasis.

M1:- Metastasis

Stage:-

→ Lap. cholecystectomy.

IA:- T1a

IVa:-

(T4 No-1 (T4No, T4N1) → Extended cholecystectomy

IB:- T1b

IVb:-

Tany (N2)

Extended (Rt). Hepatectomy

IIA:- T2a

Tany Nany (M1)

Palliaⁿ chemotherapy.

IIB:- T2b

IIIA:- T3

IIIB:- T1-3(N1)

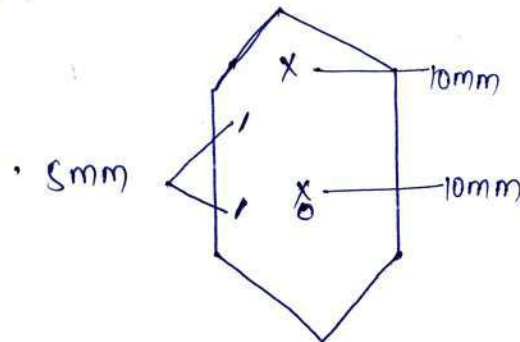
Extended cholecystectomy



En-bloc :- in one piece

- En-bloc Removal of segment IVb & V of liver + GB + LN :-
- ① Cystic duct
 - ② Peridochal LN
 - ③ Periportal LN
 - ④ Retropancreatic LN

Lap chole :-



* Port site excision is not an isolated procedure usually performed in Extended cholecystectomy not having survival advantage, it's having prognostic imp. only.

* Survival :- Prognosis is very poor in stage 4 :- 2-4 month
 17% Survival is < 5% in popula?

* Indicaⁿ of prophylactic cholecystectomy.

- ① Heart Transplant Recipient
 - ② lung " , , }
- in these we give cyclosporine
↓ cause
↑ Gallstone formaⁿ
- ③ Prolonged TPN Requirement
 - ④ Bilio pancreatic diversion.
 - ⑤ Gall stone ≥ 3 cm (> 2.5 cm)
 - ⑥ Trauma to GB
 - ⑦ Non-functioning GB.
 - ⑧ Ch.~~chol~~ typhoid Carrier.
 - ⑨ Ch. Hemolytic condiⁿ
 - ⑩ Adenomatous polyp^t Stone.
 - ⑪ PORCELAIN GB
 - ⑫ Incidentally detected Gall stone during Elective sx.
 - ⑬ Gall stone in the Relative of G. GB pt.

Diabetic is not indicaⁿ
of prophylactic
cholecystectomy

* DM is not an indicaⁿ for prophylactic cholecystectomy ∵ incidence of Ac. cholecystitis is similar to normal populaⁿ.

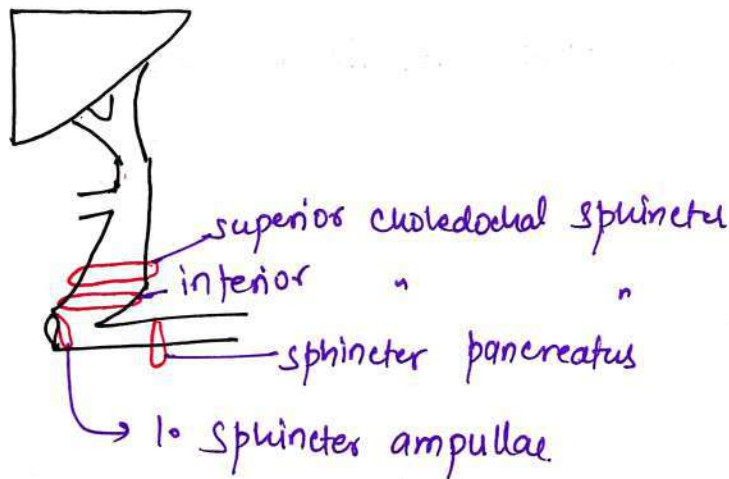
* Who perform 1st lap. cholecystectomy :- ERIC MOURE



Who perform 1st Video assisted lap.
cholecystectomy :- PHILIP MOURET

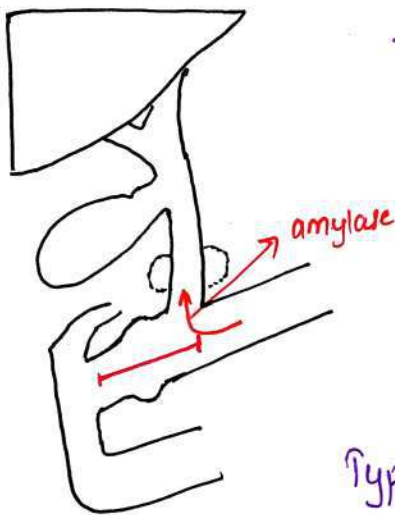
BILE DUCT

4 sphincter:-



choledochal cyst.

- Dilatation of Bile duct
- Congenital, children, female
- Hypothesis:- APBDJ (Ab@ Pancreatic Biliary duct-junc)



- TODANI MODIFICAN OF ALONSO-LEJ CLASSIFICAN
Type 1 :- Dilaⁿ of Extrahepatic Bile duct.

1a:- cystic dilata?

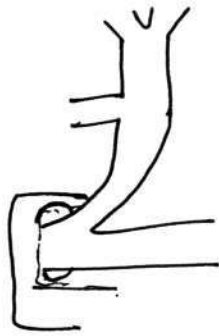
1b:- focal segmental dila?

1c:- FUZZYFORM dila?



Type 2 :- Diverticula forma? in Extra hepatic Bile duct.



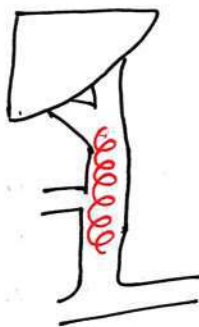


Type IV :- Dilation of Intra + Extra Hepatic Bile duct.

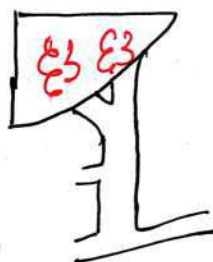
IVa



IVb - Multiple cyste Extra-Hepatic Bile duct.



Type V :- Multiple cyste intra-Hepatic Caroli d's.





MC type :- 1 > 4 > 3

Type I MC in :-

-) choledochal cyst
-) Hiatal Hernia.
-) Gastric ulcer
-) fistula in ano.
-) Posterior urethral valve

Δ of choledochal cyst :-

- ① Abdominal Mass
- ② Pain
- ③ Intermittent Mass

Rx :- ① Type Ia & Ib :- LIVER TRANSPLANTATION.

②



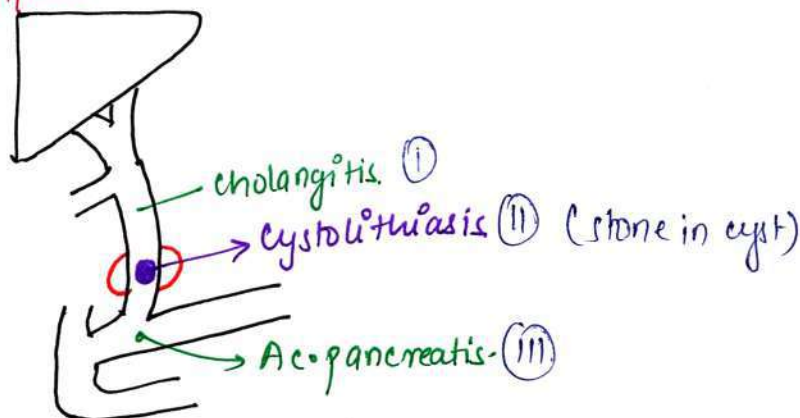
Type 1, 2, 4b :- ROUX-EN-Y HEPATICO - JEJUNOSTOMY.

③

Type 3 :- Endoscopic sphincterotomy & cyst on roofing.

11. Mc Symptom in pt. C2T1: ^{gallbladder} Abdominal pain.

* Complica?



(iv) ↑ Risk of 5 Malignancy

- Liver
 - GB
 - CBD → Maximum Risk for cholangio Ca.
 - pancreas
 - Duodenum
- ↳ Mc site of cholangio Ca. in choledochal cyst. ↓ posterior wall of the cyst

∴ If sx done life long follow up is Required.

* Ioc: ① USG

② CECT

③ ERCP

④ MRCP ✓

⑤ PTC

MRCP :- Magnetic Resonance cholangio pancreaticography.

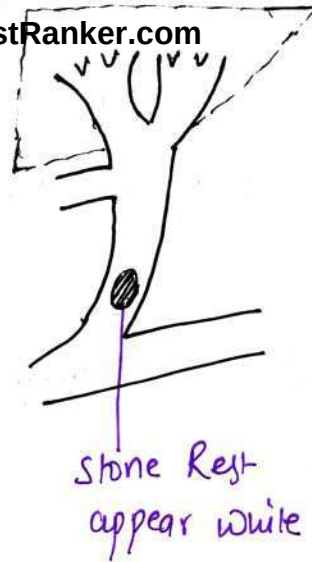
• It is T_2 -phase of MRI.

↓ on T_2

① fast moving fluids, tissue, fat- are SIGNAL VOID (having no signal) ↓ it appear Black

② slow moving fluid (Bile, pancreatic juice) is having high signal intensity ↓ it appear White

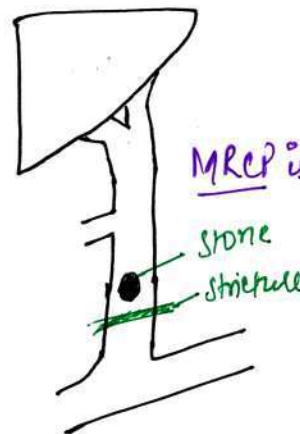
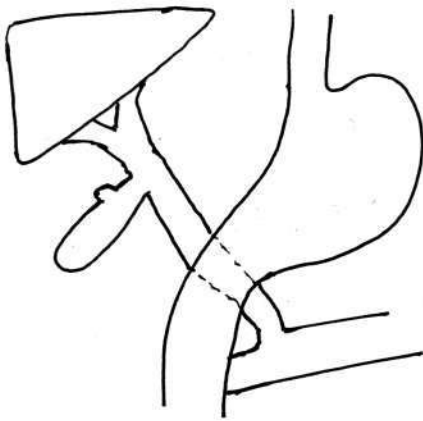
* NO contrast given in MRCP



* MRCP is Dc:- for Asis of CBD Stone, Billiary stricture, Choledochal Cyst

* Dc for Asis of cholangio Ca:- MRI + MRCP

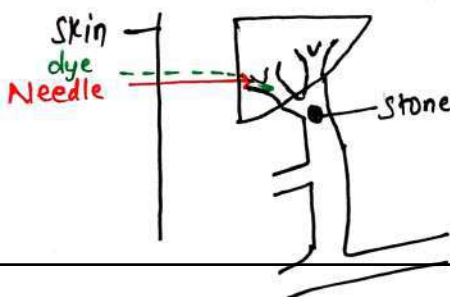
* ERCP:- Endoscopic Retrograde Cholangio Pancreato Graphy:-



MRCP is done for Asis.

*) ERCP is both diagnostic & therapeutic. used for Removing distal CBD stone and used for stenting of distal Billiary stricture.

* PTC :- Percutaneous Transhepatic cholangiography :-



PTC is both diagnostic & therapeutic used to remove stone from intrahepatic Bile duct, from proximal part of Bile duct & to put Stent for proximal Billiary stricture.

- Seen in 6-12% pt. of Gall stone.
- 3 parameter for indicaⁿ of CBD stone:-

1) ALP

2) GGT (γ -glutamyl Transpeptidase)

3) S' Nucleotidase

- 2 type of stone:-

* Retained CBD Stone

- detected in 2nd yr of Cholecystectomy

Recurrent CBD stone

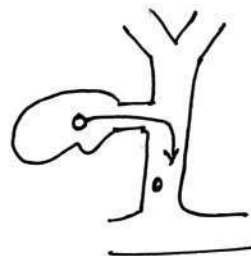
- detected after 2nd yr of Cholecystectomy

* Primary CBD stone

- Stone formed in CBD
- Mc Stone - BROWN
- Mc in developing country

2° CBD stone

- 1) Stone formed in GB
- 2) Mc Stone - Cholesterol
- 3) Mc in Western country.



- Clf:-
- 1) Asymptomatic Elevaⁿ of ALP, GGT, S' Nucleotidase
 - 2) Symptomatic $\frac{7}{11}$ jaundice

- *) Ac. pancreatitis
- *) Cholangio Carcinoma.

*1) DOC:- MRCP.

*2) GOLD std:- ERCP.

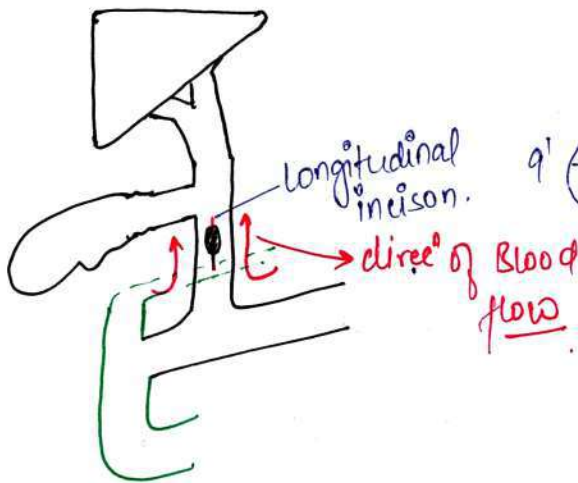
(Diagnostic & therapeutic)
 Asic

*3) R:- do yr ♂ + ♀ + dem stone in CBD

- ① ERCP
- ② Lithotripsy
- ③ Cholecholestomy
- ④ Cholecholedodenostomy

*4) Maximum size of stone $\leq$ can be removed by ERCP:- 1.5cm

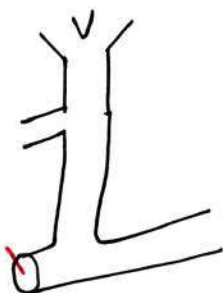
*5) stone $\geq$ 1.5cm Stb removed after Cholecholestomy



*6) stone $>$ 1.5cm incised Cholecholestomy performed

*7) Cholecholedodenostomy is optional performed only when distal obstructⁿ suspected in CBD.

*8) Best locaⁿ for performing sphincterotomy :- 11 o'clock posi?



* Two factors are Mandatory:-

(i) Obstruction

(ii) Infection

Cholangitis

* Cause of ~~obstruction~~:-

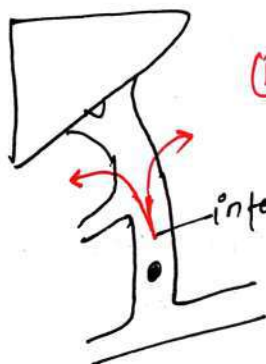
(i) CBD Stone

(ii) Cholangio Ca.

(iii) Biliary Stricture

(iv) Choledochal cyst

(v) Worms.



(i) Cholangio Lymphatic Reflux

(ii) Cholangio Venous Reflux

Clf:- CHACOT'S Δ:- PAIN + JAUNDICE + FEVER

REYNOLD'S PENTAD:- d/t inadequate Rx (5) delay in Rx

→ Charcot Δ + Shock + Mental status changes.

R:- (i) Put 2 large bore IV cannula



→ Start IVF

→ Start IV antibiotics



→ Most pt. improved after conservative Mx

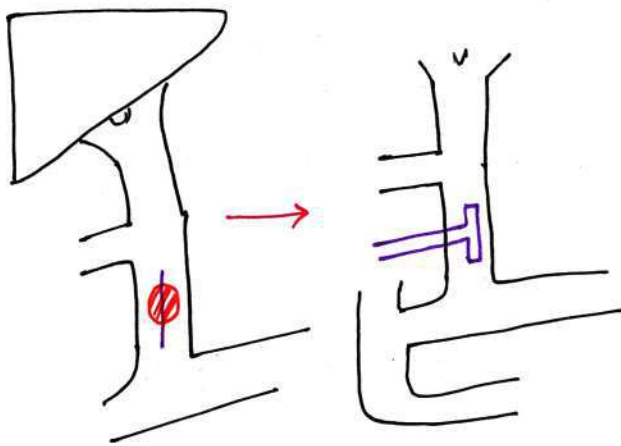
① ERCP & stone Removal / stenting

↓ if not available / fail

PTC & stone Removal / stenting

↓ not avail. / fail

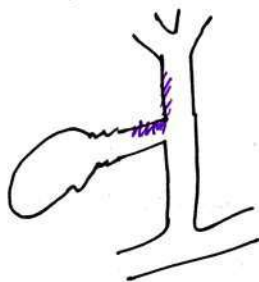
open Biliary decompression.



Q:- T-tube cholangiogram perform @:- 7-10th day.

Q:- In case of distal filling defect:- Retain T-tube X4-6wk and percutaneous extract of stone is performed by BURKHENNE'S TECHNIQUE.

Q:- MC injured part of Bile duct in Lap cholecystectomy
↓
proximal part (lateral wall of common Hepatic duct).

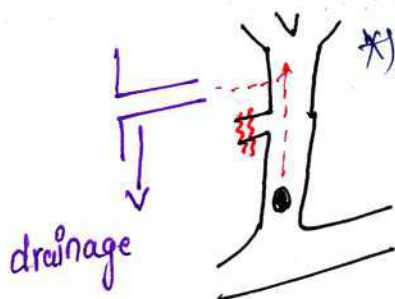


- incidence of BD injury in open cholecystectomy :- 0.1 - 0.2%
- " " " " " lap. cholecystectomy :- 0.3 - 0.85%
- Significant BD injury is caused by Experienced Surgeon in >97% of cases d/t visual illusion (or) Mispercepⁿ.
- <3% cases are caused by Beginners d/t lack of Experience.

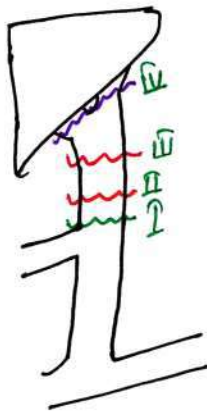
* Steps of Mx :- of post operatively Ascd pt. of BD injury :-

- ① Control the infecⁿ by IV antibiotics.
- ② drain the Biloma → By USG Guide / CT guide percutaneous aspiraⁿ (or) drain insertion.
- ③ complete the cholangiography. by MRCP / ERCP
- ④ Definitive Rx :- ERCP w/ stenting
- Roux-En-Y Hepaticojejunostomy.

*



- * After drain inserⁿ if output is decreasing only observaⁿ is done ∵ it stops spontaneously
- * ↑sing drain output is suggestive of Distal obstructⁿ → ERCP s/b performed for Removal of obstructⁿ (or) stenting.



I :- Low stricture

II Common hepatic stump < 2cm
Mid stricture

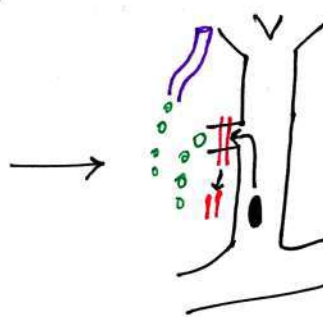
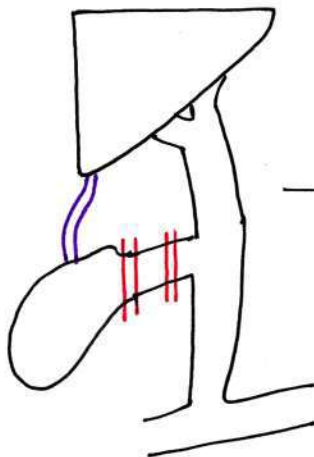
III Hilar stricture & intact confluence

IV :- Hilar stricture & destroyed confluence

V :- Stricture involving aberrant Rt. Sectoral duct & or involvement of common hepatic duct.



* STRASBERG classification of laparoscopic Bile duct injury :-



Type A :- cystic duct stump leak or leak from sub vesical duct of LUSCHKA (MC type)

Type B :- Transection & occlusion of aberrant of Rt. Sectoral duct.

Type C :- Transec' & occlusion of aberrant of Rt. Sectoral duct.

Type D :- injury to lateral wall of common hepatic duct.

Type E :- C1 to E5 Bismuth classification

1) MC in Male.

2) 1° Biliary Cirrhosis is MC in female.

* Autoimmune disorder:-

1) MC in ♀

2) It is also auto antibodies.

eg:- ① Primary Biliary Cirrhosis :- Anti-Mitochondrial.

② Hashimoto's :- Anti-TPO (Thyroid peroxidase)

③ Grave's :- Thyroid stimulating against TSH(R)

④ Pernicious Anemia :- Auto antibodies against parietal cell.

1° Sclerosing cholangitis.

- Multiple strictures involving Both intra-Hepatic and Extra-Hepatic Bile duct

- also ulcerative colitis

- PSC & ulcerative colitis → Two independent d's that means treatment of one doesn't affect the course of another.

- Smoking is protective in:-

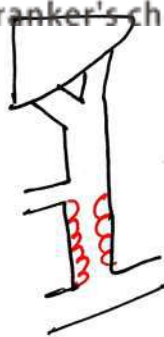
i) PSC

ii) Ulcerative colitis

iii) Alzheimer's D's

iv) Parkinson's

- Target cell of injury in PSC :- cholangiocyte



Clt:- MC presentaⁿ:- Recurrent attack of cholangitis.
(Male)

complicaⁿ:- cholecho lithiasis.

- o Cholangitis.
- o Acute pancreatitis.
- o ↑ Risk of cholangiocar.

- Doc:- MRCP

- Gold std:- ERCP.

- PRUNED-TREE app. dlt selective destructⁿ of terminal intrahepatic branches.

- Rx:- TOC:- LIVER TRANSPLANTATION.
if not avail

Control the inflamaⁿ → HIGH DOSE URSODEOXYCHOLIC ACID
(UDCA)

o to control pruritus → Bile acid sequestrant.
CHOLESTYRAMINE
CHOLESTIPOL.

PRIMARY BILIARY CIRRHOSIS:-

- Autoimmune D's

- ♀

- Auto-antibodies. (Anti-Mitochondrial)

- Astic app:- FLORID DUCT LESION & Granulomatous bile duct. Infiltrate?

Clf:- Pruritus preced jaundice.

Pruritus & fatigue are two most characteristic symptoms.

Pruritus are bothersome in evening.

It also Hyperlipidemia, Xanthoma, ~~Xanthoma~~ Xanthelasmas.

Melanosis (Hyperpigmentation of skin)

Loc:- Bx.

*Diagnosis can be made by anti-mitochondrial antibody, but Loc is Bx

Rx:- LIVER TRANSPLANTATION (Pruritus & fatigue are indica)

CHOLANGIOCARCINOMA

Rf:- ① Cholelithiasis.

② Cholelith cyst

③ Primary sclerosing cholangitis.

④ ulcerative colitis

⑤ Cirrhosis

⑥ Clonorchis sinensis.

Opisthorchis viverrini

⑧ Asbestosis, Nitrosamine, DIOXIN } AND

⑨ DM, Obesity, OCP's, smoking Thorotrast Isoniazid.

DOSTI

(GC's BHC AND DOSTI)

GC's

BHC ⑥ HBV, HIV, HCV infec

⑦ Radon.

* Pathological type

(i) - Adenoca.

- Non-specific :- CEA
Tum. marker

- Specific marker :- CA-19-9

- chemo Regimen - Gemcitabine + Cisplatin.

(ii) Diffuse infiltrative Sclerosing

(iii) Nodular

(iv) papillary.

* Mc symptoms :- 1) painless progressive jaundice 2) wt. loss.

3) ~~colic~~ Pruritis

4) fatigue

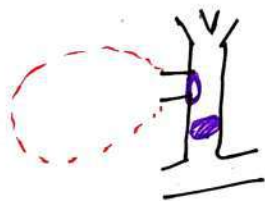
5) Anorexia

6) Passage of clay coloured stool.

CURVOISIER'S LAW :- 1) In case of obstructive jaundice GB is seldom palpable d/t stone d's (∵ GB is shriveled/fibrosed)

2) In case of obstructive jaundice GB is palpable d/t perampullary Ca.

* Exception of Curvoisier's Law :- (i) Double impacⁿ of stone (one in cystic duct & one in CBD)



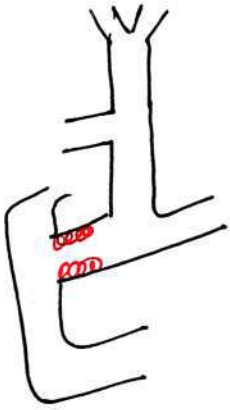
(ii) Mucocele

(iii) Oriental cholangiohepatitis.

(iv) Stone impacted @ Ampulla of Vater.

* **Ampullary Ca**:- Malignancy arising from Ampulla only.

* **Peri-Ampullary Ca**:- Malignancy arising in $\pm$ cm of Ampulla $\leq$ include:-



- i) Ampullary Ca.
- ii) Ca. Head of pancreas. $\rightarrow$ Worst prognosis.
- iii) Distal cholangio ca.
- iv) Duodenal Ca:- Best prognosis

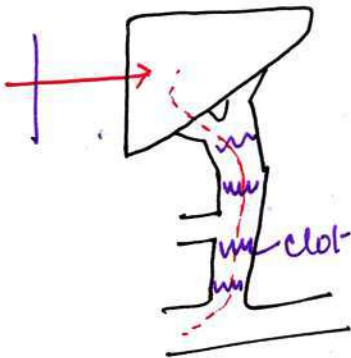
* In distal cholangio ca $\rightarrow$ GB is palpable

* **DOC for ASis**:- MRI + MRCP

* **Rx**:- ① **Hilar cholangio ca**:- CBD Resecⁿ + Caudate lobectomy $\oplus$ Lymphadenectomy. $\rightarrow$ $\because$ it drain Bile to both Hepatic duct.

② **Distal cholangio ca**:- Pylorus preserving Whipples procedure

HEMOBILIA (Blood going in Bile)



- MCC - Iatrogenic (PTC)

- clot colic $\oplus$

jaundice $\oplus$

Upper / lower GI Bleed

} QUINCK'S Δ aka
SANDBLOM'S Δ

Mc symptom of Hemobilia :- **MELENA** (40-60ml Blood req.)

1) Angiography is both diagnostic & therapeutic by embolization it can occlude the bleeding blood vessel.

R:- In majority pt :- Conservative as bleeding stop spontaneously

2) for non-responding pt :- Angiography + Embolization

↓ not available / failure

Surgical ligation

PANCREAS :-

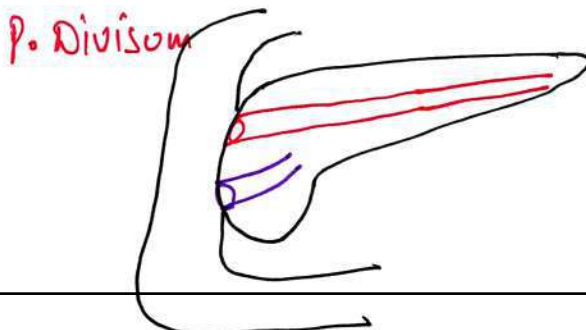
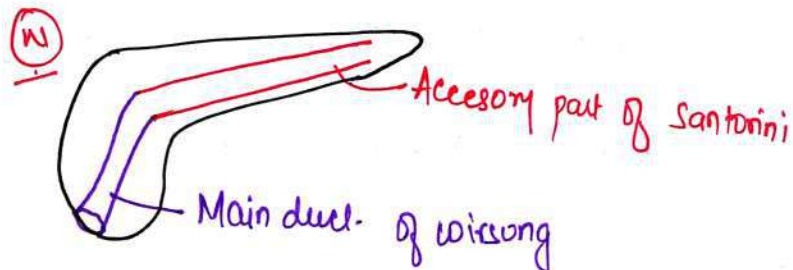
PANCREAS DIVISION

- MC congenital anomaly of pancreas.

- It is divided drainage :-

1) Dorsal part of pancreas → drained by Accessory part of Santorini.

2) Ventral part of " → drained by Main duct of Wirsung



Obstruc?

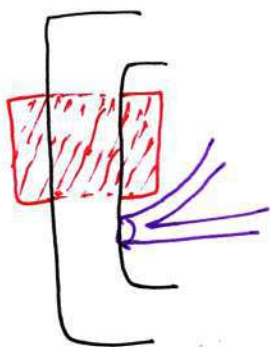
* IOC:- MRCP

* GOLD std:- ERCP

* Rx:- Dorsal duod. sphincterotomy / Dorsal duod sphincteroplasty.

ANNULAR PANCREAS

- Ring of Ventral Pancreas around 2nd part of duodenum.



1) Annular Pancreas is also Duodenal atresia and Down syndrome

2) Obstrucⁿ is proximal to Ampulla

↓ that's why

it's also Non-Bilious Vomiting.

IOC:- ERCP

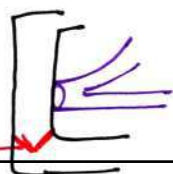
Rx:- D-D (IOC) Duodeno-Duodenostomy > D-J.ostomy

* IOC for Duodenal Atresia:- D-Dostomy.

* IOC for superior mesenteric artery synd:- Duodeno-jejunostomy

DUODENAL ATRESIA -

* Mcc of Neonatal obstrucⁿ

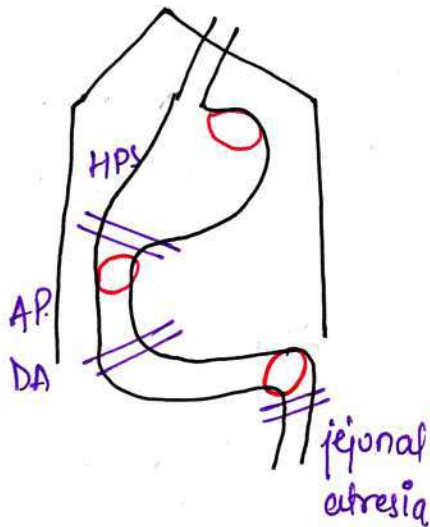


Obstrucⁿ

distal to ampulla of

Loc:- X-ray abd:- Double bubble appearance.

Roc:- D.D > D-J.



X-ray

Single bubble :- HPS

double bubble :- Annular pancreas
Duodenal atresia

Triple bubbles :- jejunal atresia

ACUTE PANCREATITIS

Etiology :- Mec: ① GB stone

② Alcohol - form stricture

③ Blunt trauma

④ ERCP

⑤ Hypertriglyceridemia

⑥ Hyperparathyroidism

⑦ Hypercalcemia

⑧ Ca. pancreas

⑨ Cystic fibrosis.

⑩ VALPROATE TV

⑪ FUROSEMIDE

⑫ METRONIDAZOLE FM

⑬ Viral Infect:-

C - CMV, COXSACKIE

M - Mumps

E - Echo Virus.

⑭ DRUGS & establish associa:-

① 6-MERCAPTO PURINE

MAD

② AZATHIOPURINE

③ DEOXY INOSINE

④ CITRABINE

CAT

⑤ AMINO-SALICYLIC ACID

⑥ TETRACYCLINE

⑦ PENTAMIDINE

⑧ ESTROGEN

PET

⑨ IMP SMO

⑩ THIAZIDE

L- ASPARAGINASE

ACETA-AMINOPHEN

Ac. Pancreatitis :-

- 1) It is characterized by abn intra pancreatic activaⁿ of pancreatic enzyme leading to injury of duct & Acini. In majority of case severity is Mild to Moderate
- 2) Severe Ac. Pancreatitis seen in 10-20% cases.
- 3) GB stone induced pancreatitis is having Best Prognosis.
- 4) MCC of death in 2nd wk of Hospitalizaⁿ in Ac. Pancreatitis :-

MODS (Multiple organ dysfunction synd)

1) MCC of death after 2nd wk of Hospitalizaⁿ → sepsis.

1) Initial sign of MODS :- Impaired lung funcⁿ caused by ARDS.

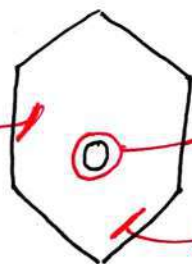
C/H of AP :- 1) Pain in Epigastrium Radiating to left side of Back partially Relieved by sitting or bending forward.

- 2) Paralytic ileus develop → Nausea, Vomiting & Abd. distension.
- 3) Lt. Sided Reactive Pleural Effusion.
- 4) Rarely also Retro peritoneal Hage or Bleeding.

⊗ Ecchymosis :-

on flank

① Grey Turner sign

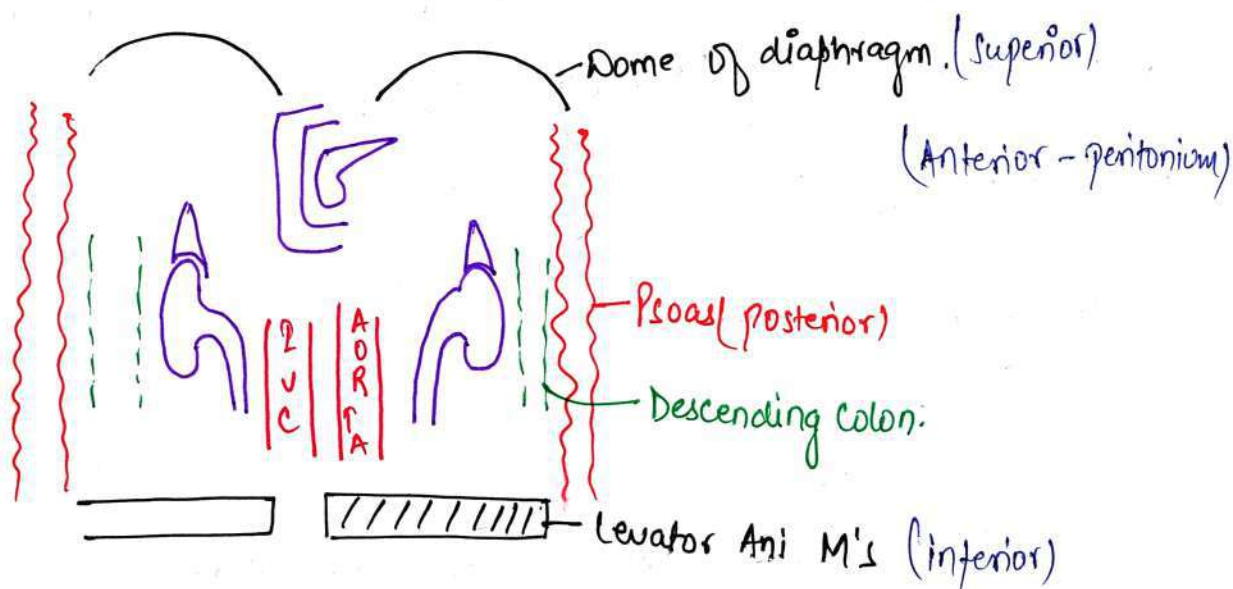


Cullen's Sign = UC (1)

Fox Sign = Inguinal Region (14)

- Though CECT is Doc for Ac. Pancreatitis, it is reserved for Asis of Ac. Pancreatitis in Equivocal Cases (or) to diagnose Complicaⁿ Related to Ac. Pancreatitis.

Boundaries of Retroperitoneum:-



* CECT is Doc for Asis of :- Retroperitoneal pathologies - eg:-

① Pancreas Related. - Ac. Pancreatitis

Pancreatic Pseudocyst

Pancreatic Abscess.

Pancreatic Necrosis

Ca. Pancreas.

Ch. Pancreatitis
↓
Doc → MRCP not
CECT

② Kidney Related:- CECT is Doc for:-

• ADPKD

• Renal TB

• RCC

• Angiomyolipoma

• Renal Oncocytoma.

* MRI is Doc for Soft tissue Related pathology:- eg.

(i) Brain Tumor

(ii) Spinal cord Tumor

(iii) Pancoast Tumor

(iv) Soft Tissue Sarcoma

(v) Staging of Head & Neck Malignancy and pelvic Malignancy

* Doc for Head injury (EDH & SDH) :- NCCT

* Doc for Diffuse Axonal Injury :- MRI.

* Usually Dx of Ac. Pancreatitis is made by :-

1) Clinical feature

(+)

(ii) Lab In. :- 1) Amylase :- ^{Problem} (i) NO correlaⁿ B/w level of Amylase & Severity of Ac. Pancreatitis

(ii) In 10-20% of Pancreatic Necrosis Amylase is (N)

2) ~~by~~ Lipase > Amylase

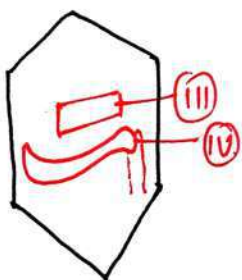
Xray Abd :- (i) Gasless abd dH ileus.

(ii) Ground glass app.

(iii) Sentinel loop (localized ileus of jejunum)

(iv) Colon cut off sign.

(v) Renal Halo Sign.



① NSAID of choice:- METAMIZOL

OPIATE of choice:- BUPRENORPHINE

② for Pleus :- RT insertion

③ Nutrition if pt. doesn't take Orally (Enteral Nutrition > TPN)

↓
By Subclavian vein

④ If infecⁿ suspected :- Antibiotic given.

* Routinely Antibiotic not given

PROGNOSTIC SCORING SYSTEM :-

① RANSON'S SCORE

② GLASGOW " } Score
≥ 3

③ BISAP "

④ CRP ≥ 130 mg/ml

⑤ APACHE ≥ 8

⑥ CT Severity Index :- Balthazar CT Grading + Necrosis Score.

* RANSON'S SCORE :- for Alcoholic Pancreatitis.

Assessed @ the time of admission

① Age > 55 Yr

② WBC Count > 16000/cu

③ RBS > 200 mg/dl

④ LDH > 350 IU/L

⑤ AST > 250 U/L

After 48 hr

① fall in Hematocrit > 10 points.

② Bun Elevaⁿ > 5 mg/dl

③ S. Ca²⁺ < 8 mg/dl

④ Base deficit > 4 meq/L

⑤ PO₂ < 60 mmHg

⑥ fluid sequestraⁿ > 6L

* BISAP (Bedside Index for Severity of Ac. Pancreatitis)

B :- BUN > 25 mg/dL

I :- Impaired Mental Status

S :- SIRS (≥ 2 of 4) (Systemic inflammatory response synd)

A :- Age > 60 yr

P :- Pleural Effusion

Score	Mortality
0-2 :-	$< 2\%$
3-5 :-	$> 15\%$

* APACHE-II (Ac. physiology and ch. Health Evalua?-II)

Mn:- BT ↑HR at CWQ SHOP-2

① BP

⑤ Creatinine

⑨ Hematocrit

② Temp

⑥ WBC count

⑩ Oxygena?

③ HR

⑦ Glasgow Coma Scale

⑪ pH

④ R.R

⑧ Sodium

⑫ Potassium

⑤

Score $\geq 8 \rightarrow$ Severe Ac. pancreatitis.

* Complicaⁿ of Ac. Pancreatitis :-

① Ac. fluid collecⁿ

② pseudocyst

③ Pancreatic abscess

④ Pancreatic Necrosis

IOC - CECT

Rx:- observe. ∵ Most ac. fluid resolve spontaneously.

* Pseudocyst

After 4wk fluid collecⁿ lined by Granula^r tissue KIA pseudocyst.

* Pancreatic abscess :- pus collecⁿ in Peri-Pancreatic Region.

Rx:- ultrasound @ CT guided percutaneous aspiraⁿ + Antibiotic

* Pancreatic Necrosis :- Non viable Pancreatic tissue @ Peri-pancreatic fat

∵ It's sterile

∵ MC Complicaⁿ :- Infeeⁿ

∵ MC Organism :- E. coli.

Rx:- Repeated Sx debridement - Necrosectomy + Ongoing lavage.
(Every 3-4 day)

PSEUDO-CYST

- Not lined by Epithelium

- Lined by Granula^r tissue.

- MCC :- Gallstone

∵ Alcohol (✓)

Induce pancreatitis.

- MC a/w ch. pancreatis
20-40%.

Multiple, small,
Intra pancreatic

Acute pancreatitis
10-20%.

Single, large, Extra pancreatic

→ d'essaz sac MC site

Large cyst $\rightarrow$ Abd. pain Multiple Episode of Non-billious Vomiting containing undigested food particle

Me complication:- Infectⁿ (14%) > H^g (10%)

Loc:- CECT

R:- 1) Observeⁿ $\because$ Most cyst resolve spontaneously.

2) Indicaⁿ of sx:-

1) Size ≥ 6 cm

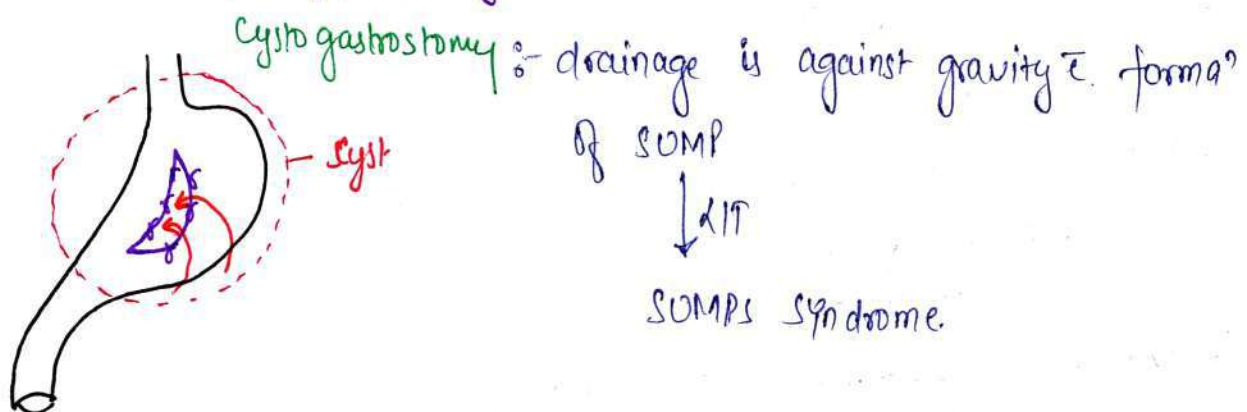
2) Duraⁿ ≥ 6 weeks.

* Surgery are:-

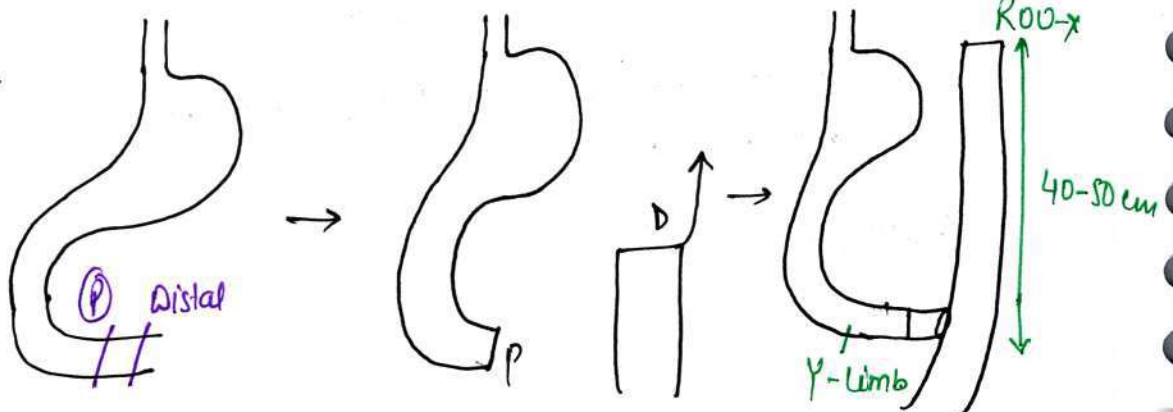
① Cystogastrostomy $\rightarrow$ Easy to Perform, Short duraⁿ?

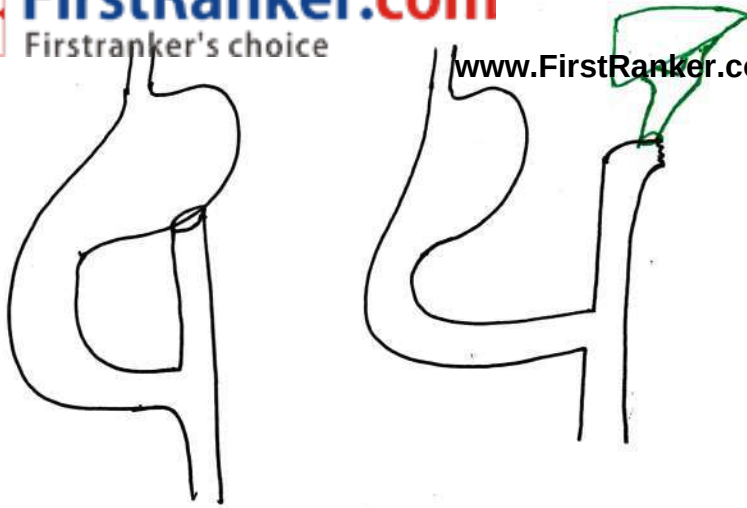
② Cystoduodenostomy

③ Cysto-jejunostomy $\checkmark$ (TOC)



* ROUX-EN-Y.





Roux-Y gastro-jejunostomy



- Drainage along gravity
- No formaⁿ of SUMP.

Disadvantage :- Blood loss

·) Anastomosis leak out.

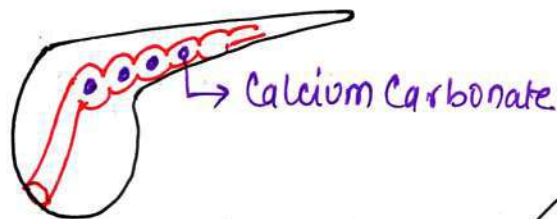
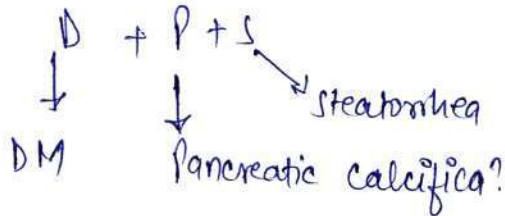
CHRONIC PANCREATITIS

- Irreversible fibrosis of pancreatic parenchyma & IT Exocrine and Endocrine insufficiency.
 - Exocrine insufficiency precedes Endocrine insufficiency.
 - >90% of Acini and Islet cell are destroyed pt. develop Exocrine and Endocrine insufficiency.
- | | |
|--|--|
| <ul style="list-style-type: none"> 1) Exocrine insufficiency Manifest as:- <ul style="list-style-type: none"> i) Indigestion ii) Malabsorption iii) Steatorrhea | <ul style="list-style-type: none"> Endocrine insufficiency Manifest :- DM |
|--|--|

*) Smoking is Synergistic Effect for causing pancreatitis.

~~Alcohol~~

*) Δ of ch. pancreatitis Mn: DPS



MC symptom: Abdominal pain.

*) Pancreatic calcifica? is seen on Xray - 35-45%

IOC: MRCP

Gold Std: ERCP - [Chain of lake
String of Pearl
Beaded app.]

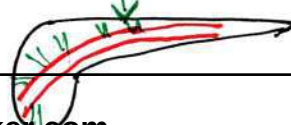
Q Most accurate Ix to Δsis the Early change of ch. pancreatic (Changes limited to Minor duct)

① CECT

② MRCP

③ ERCP

u) Endoscopy

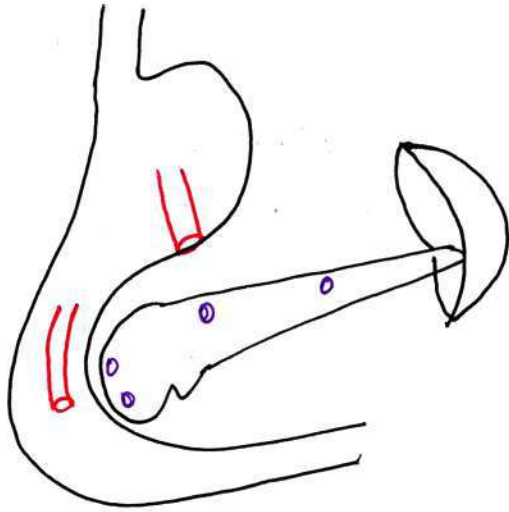


and this diagnosis of Chronic pancreatitis based on

www.FirstRanker.com

45

Based on Endoscopy USG



Rx: Exocrine insufficiency :- Pancreatic Enzyme Supplement.
Endocrine :- Insulin.

NSAID OF choice :- METAMIZOLE

OPIATE OF choice :- BUPRENORPINE

↓ Pain not Relieved after analgesic.

ERCP & Stenting

↓ Not available / fail

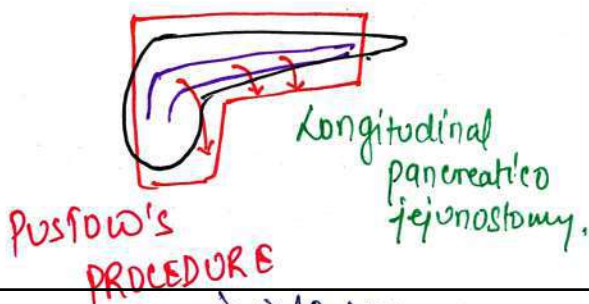
Celiac Ganglia Block

↓ failed

SURGERY

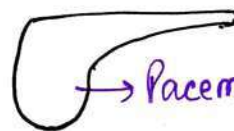
Sx:-

DRAINAGE PROCEDURE



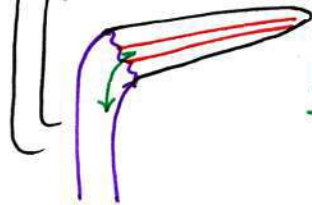
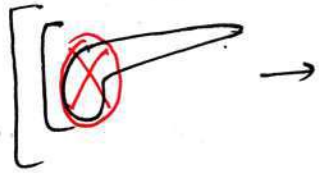
→ 40-60% Pain Relieved

RESECT PROCEDURE

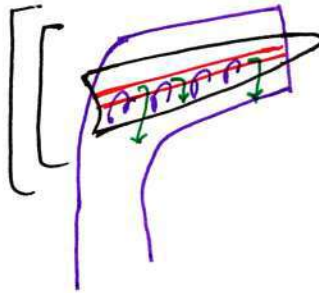


i) BEGER'S Procedure (DPPHR) - Duodenal preserving pancreatic Head Resec?

ii) FREY'S Procedure (LRLPJ) - Local Resec of pancreatic Head & Longitudinal pancreaticojejunostomy.



BEGGER'S → Maximum pain Relieved.



→ freely

⊗ pain will not Relieved completely
∴ it is irreversible

CA. PANCREAS.

- MC Mutaⁿ in Ca. Pancreas:- K-RAS > P-16

Endangio ca. Ca. Pancreas } - K-RAS > P-16

- Ca. GB → P53 > K-RAS

- Ca. Stomach → p53 > COX-II

⊗ Rf: 1) Two Established Rf :- ① Smoking

② Hereditary factor AUMS

1) Associaⁿ :- D - DM

2) Ca. Pancreas O - Obesity

C - Ch. pancreatitis

Hereditary factor:- H₃AFP → AUMS AD except

H:- Hereditary Pancreatitis

K:- HNPCC

H:- Hereditary Breast & Ovariaⁿ Ca.

A - Ataxia Telangelectasia - AR

F:- familial atypical Multiple mole Melanoma synd (FAMMM)

P:- Peutz jegher's synd
↳ Maxi. Risk

Age group :- 6th/7th decade

Male Smoker

Mc site :- Head > Body > Tail

Mc Histological type :- Adenoc.

Non-specific :- **CEA**
markers

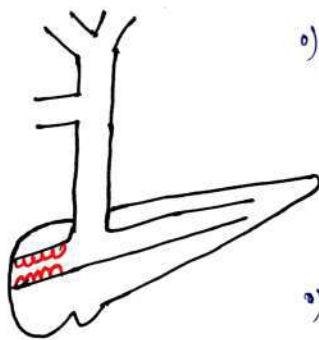
Specific marker **CA 19-9**

Chemotherapy :- **Gemcitabine**

C/f :- Mc symptoms :- jaundice > wt. loss

Other :- Anorexia, fatigue, pruritis.

Clay coloured stool.



In pt. of Ampullary Ca :- Waxing & Waning of jaundice in every 2-3 months & Melena. It is seen in 1/3rd of Ampullary Ca.

In pt. of pta-pancreas :- GB are palpable

MIGRATORY SUPERFICIAL THROMBOPHLEBITIS :-

Trousseau Sign :- Carpal spasm in pt. of hypocalcemia

Trousseau synd :- Migratory superficial thrombophlebitis
↳ Mc Ca :- Ca. Pancreas

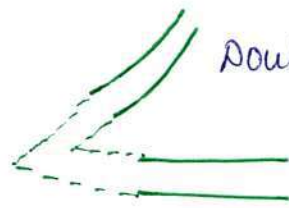
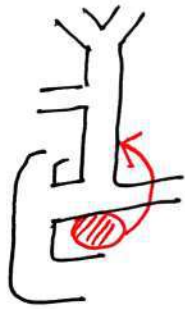
Wrisberg's Sign Lt. Supraclavicular Lymph node in Malignancy.

Loc of Ca. Pancreas :- **CECT**

radiological sign in Ca. pancreas:

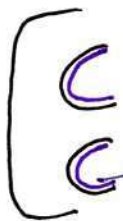
① Widening of 'c' loop of duodenum

②



Double duct Sign :- Ca. Head of pancreas.

③



Reverse '3' Sign of FROSTBERG :- Ca. Head of pancreas

inflammatory changes in Middle wall of duodenum.

④



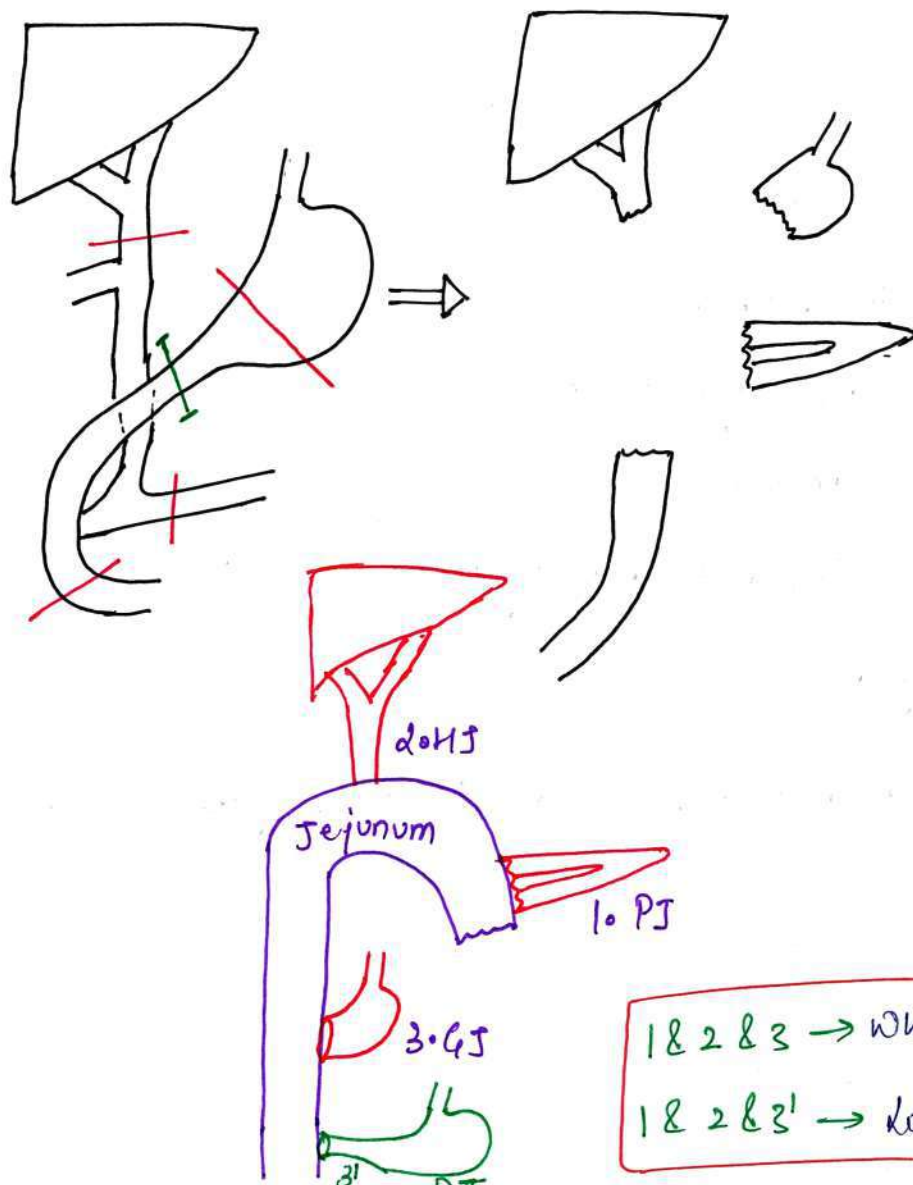
ROSE-THORN APPEARANCE :- Ampullary Ca.

⑤ Mucosal Irregularity

⑥ Scrambled Egg appearance

Rx:- ① WHIPPLE'S PROCEDURE → aka Pancreaticoduodenectomy (PD)

② LONGMIRE - TRAVERS Procedure → aka Pylorus preserving Pancreaticoduodenectomy (PPPD)



- * Sequence of anastomosis - $PJ > HJ > GJ$ performed in anti-clockwise fashion.
- * MC complicaⁿ of pancreaticoduodenectomy = delayed gastric emptying.
- * Most imp. margin in pancreaticoduodenectomy is Uncinate margin aka superior mesenteric vessel margin (or) Retroperitoneal margin.
- * Maximum risk of anastomatic leak occurs @ - $PJ > GJ > HJ$.
- * MCC of death in ~~pancreaticoduodenectomy~~ after PD :- Cardiopulmonary complicaⁿ?
(Pancreatico-duodenectomy)

I & II :- 16-20m

III :- 6-10m

IV :- 3-6m

MC cystic lesion of pancreas :-

- ① SCN Serous cystic Neoplasm
- ② MCN Mucinous "
- ③ IPMN Intraductal papillary Mucinous Neoplasm,
- ④ pseudocyst ✓ (Responsible for 75% of case)

MC cystic Neoplasm of pancreas → Mucinous cystic adenoma,

SEROUS CYSTADENOMA

- aka Serous cystic Neoplasm
- MC in female
- 5th / 6th decade
- MC site :- Head of pancreas
- Benign.
- Individual cyst all very small that's why → MICRO CYSTIC
-  spong like appearance
Honeycombing
- It is also (N) CEA and (N) amylase & serous content.
- Clf :- Mostly asymptomatic

IOC :- CECT - CENTRAL SUN BURST Calcifica?

Central stellate Scar

fr - observa?

MUCINOUS CYSTADENOMA (MCN)

- Premalignant
- 5th/6th decade, ♀
- MC site:- Body and tail of pancreas.
- MC Cystic Neoplasm of Pancreas → MCN

pathology: Macrocytic



Content - Mucinous.

CEA ↑

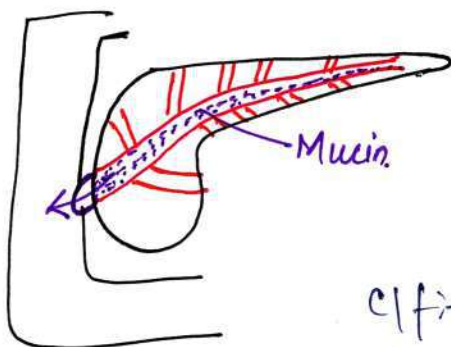
Ⓝ amylase (∴ not also ac. pancreatitis)

Loc:- CECT - ~~ECCT~~ Peripheral Egg-shell calcificaⁿ.

R:- Distal pancreatectomy

IPMN (Intraductal papillary Mucinous Neoplasm)

- Premalignant
- 6th & 7th decade
- M = F



- It is characterized by:-
- i) Mucinous content
- ii) ↑ CEA
- iii) ↑ Amylase

C/f:- Recurrent attack of Ac. pancreatitis.

Loc:- Endoscopy:- Mucin protruding from FISH-MOUTH OPENING

R:- Partial pancreatectomy.

NEURO-ENDOCRINE TUMOR. OF

PANCREAS.

1) MC NET of Pancreas:- Non-functional (POMA)
pancreatic polypeptidoma.

2) MC functional NET of Pancreas:- Insulinoma. (Benign)

3) MC functional Malignant NET of Pancreas:- Gastrinoma.

* Characteristic of NET:-

1) NET are symptomatic $\because$ of production of active substance.

2) They are symptomatic @ Early stage

3) Diagnosis is made @ laboratory after measuring active substance $\textcircled{08}$ its metabolites.

* All Neuro Endocrine Tu. except insulinoma express Somatostatin Receptor
that's why the Doc for localizaⁿ of Most of Neuroendocrine-Tu.
except Insulinoma is SRS (Somatostatin Receptor ^{Scintigraphy} ~~Scintigraphy~~)

INSULINOMA

1) MC functional NET of Pancreas.

2) Benign

3) Equally distributed in Head = Body > tail

Whipple's Δ :- ① Symptoms of Hypoglycemia

② Blood glucose level 45-50 mg/dl

③ Relief in symptom after taking oral glucose.

① Neuroglycopenic symptom.

- Headache
- dizziness
- confusion
- In severe case - Hypoglycemic coma

② Sympathetic stimulaⁿ symptom :-

- tachycardia
- palpitaⁿ
- Excessive sweating
- Tremor

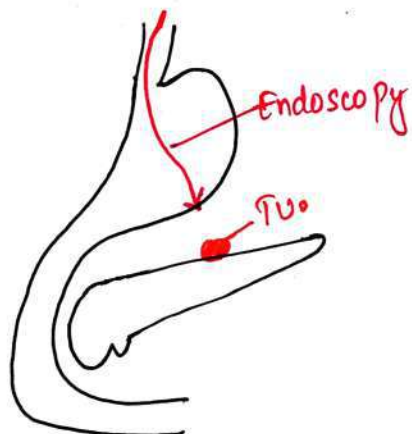
③ Painless tumor

④ at w wto gain.

Lx
* Gold std :- 72hr fasting :- In this the Ratio of Insulin : Glucose ≥ 0.4 is diagnostic

* Best pre-operative Test for localizaⁿ of Insulinoma :- Intra Arterial Calcium injectⁿ & portal Venous Blood Sampling.

* Overall Best Lx for localizaⁿ of Insulinoma :- Intra operative Endoscopic USG & Manual palpaⁿ.



~~Best Lx~~

Best Lx for localizaⁿ of Insulinoma

1. CECT
2. MRCP
3. ERCP
4. EUS ✓

Diagnosis:- directly toxic to islet cell.

*) If Iv. located in Body & Tail:- TOC:- Distal pancreatectomy.

*) Benign Iv. located in Head of Pancreas:- Enuclea?

*) Malignant " " " " :- Pylorus preserving Whipple procedure.

*) Insulinoma Head of Pancreas:- Enuclea?

*) " Body & Tail :- Distal pancreatectomy

GLUCAGONOMA aka. Hyperglycemic Cutaneous synd.

*) MC Symptom :- NEM (Neurolytic Erythema Migrans)

*) "4D" Syndrome.

(i) DM.

(ii) Dermatitis

(iii) DVT

(iv) Depression.

} Rest of the Symptom.

*) MC Site:- Body & Tail.

*) TOC:- Glucagon level.

*) TOC for localization:- SRS

*) ROC:- Distal pancreatectomy

GASTRINOMA Zollinger-ELLISON SYND.

*) $\uparrow$ Gastrin $\rightarrow$ $\uparrow$ Acid produce $\rightarrow$ PUD.

*) Ulcers seems like:- (i) atypical ulcers

(ii) Multiple "

(iii) Refractory "

(iv) Large "

(v) Jejunal

- 1) Duodenum > Pancreas. :- Mc site of ulcer
- ↓
- 1st > 2nd > 3rd > 4th

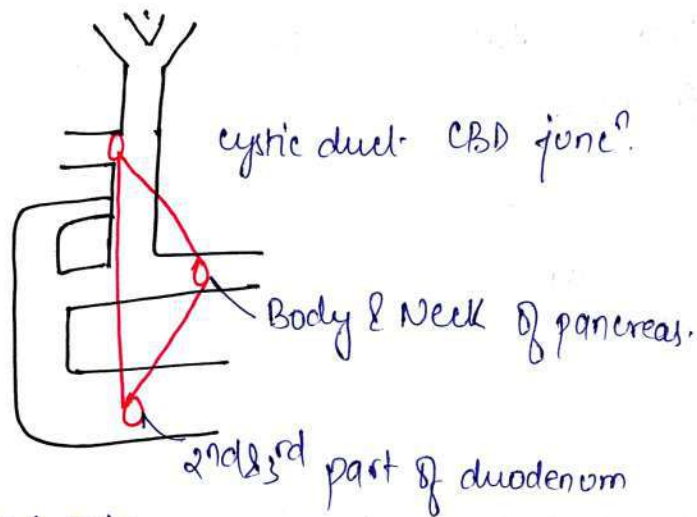
Duodenal gastrinoma

- 1) Metastasis to LN
- 2) Good

Pancreatic gastrinoma

- 1) Metastasis to liver
- 2) Poor prognosis

*1) >90% Gastrinoma located in Δ of Passaro



Mc Symptom:- 1) Abd. pain

- 1) Retrosternal Heart burn
- 2) dyspepsia
- 3) Reflux
- 4) Diarrhea

Characteristic symptoms:- Nasogastric aspiraⁿ characteristically relief diarrhea in gastrinoma

2oc:- Basal Acid Output > 15 meq/hr

Best provocative test for diagnosis of gastrinoma: - Secretin Stimulaⁿ test.



Release of gastrin > 200 pg/ml after secretin injectⁿ is diagnostic.

* ROC for localizaⁿ: SRS.

* Doc: PPI

* ROC: pylorus preserving Whipple procedure

VIPOMA → Secretory diarrhea → loss of all electrolyte except Ca & RBS.

- VERNER-MORRISON SYND.

- WAHA SYND

- Pancreatic cholera

→ Watery diarrhea
Hypokalemia
Achlorhydria

→ Hypercalcemia & ↑RBS (↑Glucose)

Mc site: - Tail of pancreas.

ROC: It's a type of Medical Emergency that's why R_s is correct of hypovolemia, and dyselektrolytemia f/b distal pancreat~~omy~~ectomy.

→ Narrowest tube of GI

→ Length :- 25cm

- Extent :- C6 - T11

- 3 Narrowing seen on Endoscopy from Upper Incisor

- 15

25

40 cm

- B

AL

D

Cricopharynx

Arch of aorta
Left Bronchus

Diaphragm

- No Serosa, No villi, No Secreⁿ, No Meissner's plexus.

- L → L (Lymphatic in lamina propria)

- Diameter of Cricopharynx :- 1.5cm (Narrowest in entire GI)

- If the foreign body crosses ~~cricopharynx~~ cricopharynx it can be observed except

- ① Sharp foreign body
- ② Button battery

Necrosis
Acid cause :- Coagulative
Alkali n 7 Liquifactive

Congenital diaphragmatic Hernia

- BOCHODALEK HERNIA

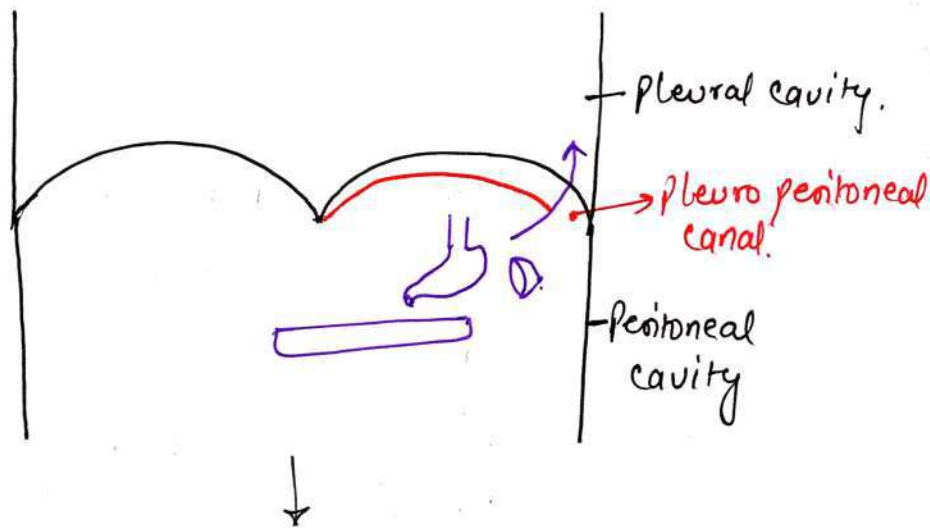
- ① sided posterolateral Hernia

- Mc type of CDH

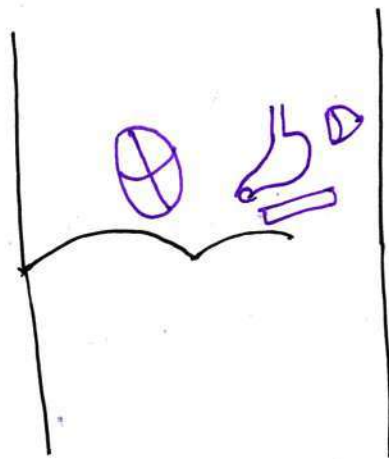
- ① side

- Incidence :- 1:2000 - 5000 live birth

- Bag & Mask Ventilaⁿ is C/P.



1st Organ to herniate :-
Stomach > spleen > Transverse colon.



pathophysiology :- absence of closure of pleuro. peritoneal canal L17

Hernia of Stomach, spleen, Transverse colon in thorax

Triad :- R + D + S

- 1) Respiratory distress
- 2) Dextro. Cardia
- 3) Scaphoid abdomen.

Most important prognostic factor for MR of testis → pulmonary Hypertension
pulmonary HTN.

- *) Congenital Malformaⁿ involving Swallowing Mechanism @ GIT are also Polyhydramnios.
- *) Congenital Malformaⁿ involving Genitourinary tract are also Oligohydramnios.
- *) Asis confirmed by CXR → There is presence of gastric bubble in thorax.
 - *) On RT insertion coiling occurs in stomach located in thorax.
- *) Rx :- Reduce the Herniated content back to the abdominal cavity closed the defect.
 - *) for large defect → prosthetic patch is used.

MORGAGNI HERNIA

- Larrey's Hernia
- (RT) Sided Retrosternal Hernia
- Less common
- on (RT) Side.

**) Via space of Larrey :- Superior Epigastric Vessel pass. d/t defective development of central tendon of diaphragm the space is Enlarged and the MC Organ herniate Transverse colon.

Rx :- Reduce the content and close the defect.

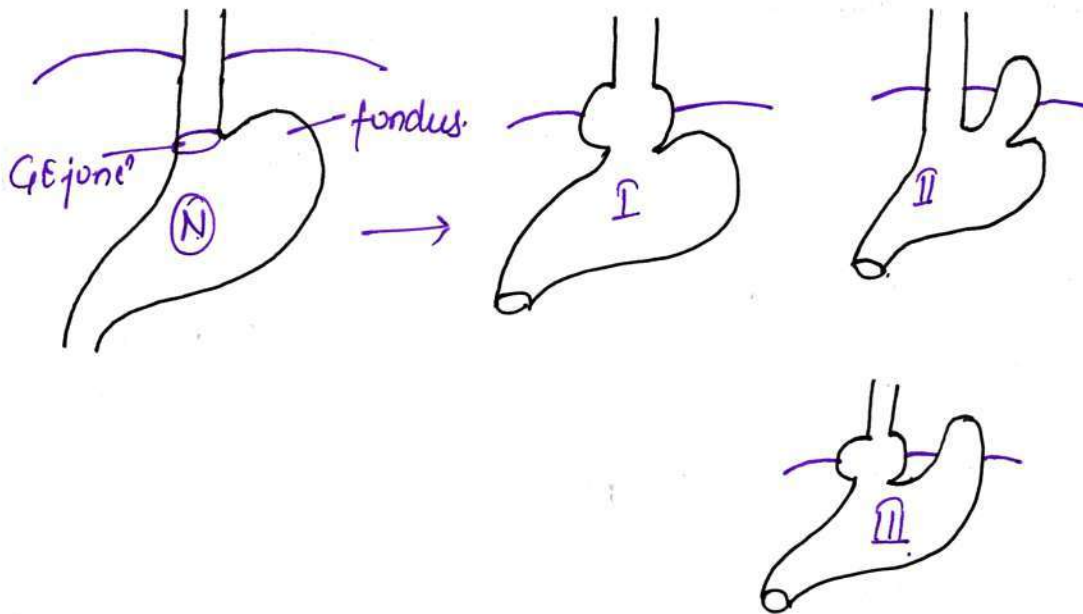
HIATUS HERNIA

Type I :- Sliding Hernia (Mc type)

II :- Rolling Hernia

III :- Mixed (I+II) Mc type of Paraesophageal Hernia.

IV :- Organ other than stomach is herniated.



C/f :- Type I :- Reflux

II :- Abdominal pain

III :- Both Reflux and Abdominal pain

IV :- Abdominal pain $\pm$ $\uparrow$ risk of complications

DOC :- ① Barium swallow $\checkmark$:- Hiatus Hernia & Zenker's diverticula

② Endoscopy + Bx :- Barret Esophagus + Ca. Eso.

③ Manometry :- Motility disorder of Eso. :- Achalasia Cardia, Diffuse Eso spasm, Nutcracker Eso.

④ 24-hr pH monitoring :- GERD.

eg: ① Barium Swallow Doc for Dis :- Zenker's & Hiatus.

② Barium Meal (Stomach) :- Doc for Dis :- Gastric diverticula.

③ Barium Meal follow through :- Doc for Dis :- Small Bowel diverticula.

④ Barium Enema :- Doc for Dis of Colonic diverticula.

* Enterocolitis aka Small Bowel Enema.

→ It is preferred over Barium meal follow through.

→ It is Doc for Dis of Small Bowel diverticula and Crohn's D's.

* Rx of Hiatus Hernia :- Laproscopic Hiatus Hernia repair by Abdominal Route.

* CAMERON'S Ulcer aka Riding ulcer. Seen in sliding Hernia.

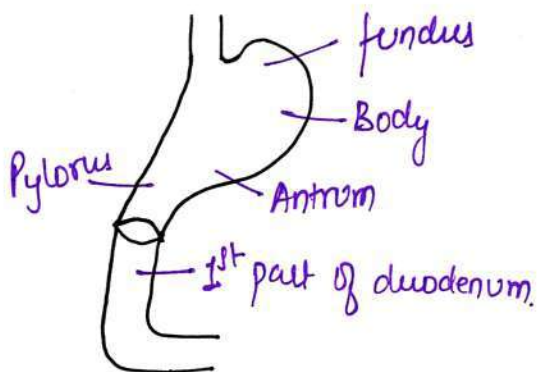


* Cushing ulcer :- Seen in Head injury pt.

* Curling ulcer :- BURNS.

When $> 1/3^{\text{rd}}$ Body surface are involved in Burn then develop Curling ulcer.

* MC Site of stress ulcer (Gastritis) :- fundus > Body > Antrum > Pylorus > 1st part of duodenum.



- 1) Total length :- 5 cm
- 2) Intra abdominal length :- 2 cm
- 3) (N) LES pressure :- 6-26 mm Hg
- 4) Incompetent LES :- Total length < 2 cm
(permanent defect) Intra-abdominal < 1 cm length
LES pressure < 6 mm Hg

- DRUGS + LES Pressure :-

Mn :- PMT BD CAN + LES PRESSURE

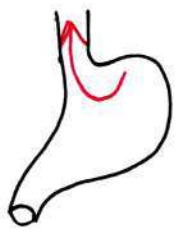
- ① Prostaglandin E_1 & E_2 , Progesterone
- ② Morphine, Meperidine
- ③ Theophylline
- ④ Barbiturates.
- ⑤ Diazepam, Dopamine
- ⑥ CCB
- ⑦ Atropine
- ⑧ Nitrate

- food + LES Pressure :-

Mn CAPS FAT + LES PRESSURE

-) chocolate, coffee
-) Alcohol
-) piperment.
-) Smoking
-) fatty food.

- Caused by Incompetent LES.



→ GERD



Esophagitis



Ulcers



Fibrosis



Stricture



Columnar Metaplasia ⇒ Barrett's Esophagus



Adeno Ca.

* In pt. of Barrett's ulcer Stricture is located in the Middle part of Esophagus.

Clf of GERD:-

① Retrosternal Heart Burn.

② Reflux

③ Regurgitaⁿ

④ Dyspepsia

⇒ ↑ risk of Bronchial Asthma in children.
cough is common symptom in children.

DOC:- 24 hr pH monitoring

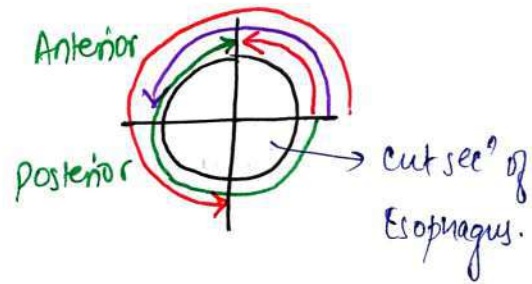
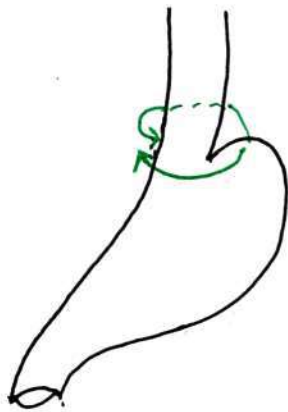
De-Meester's . Score < 14.7 (N)

∴ > 14.7 → GERD

Rx:- DOC:- PPI

RxOC:- laproscopic Modified Nissen's Fundoplicaⁿ.

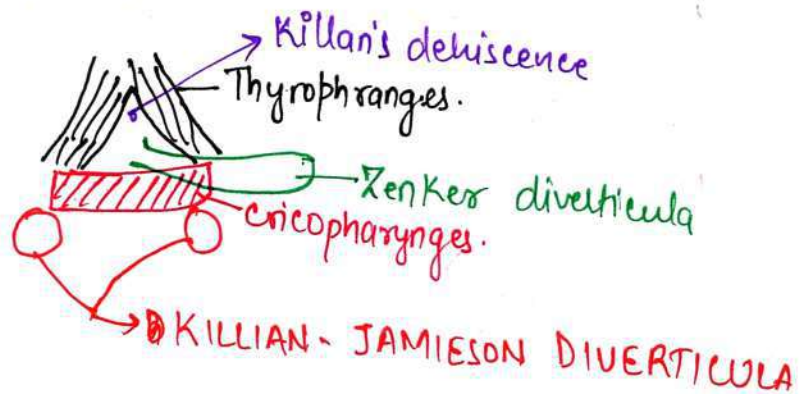
- ① 24 hr pH monitoring for ASIS.
- ② Barium swallow to rule out sliding hernia
- ③ Endoscopy + bx to rule out Barrett Eso

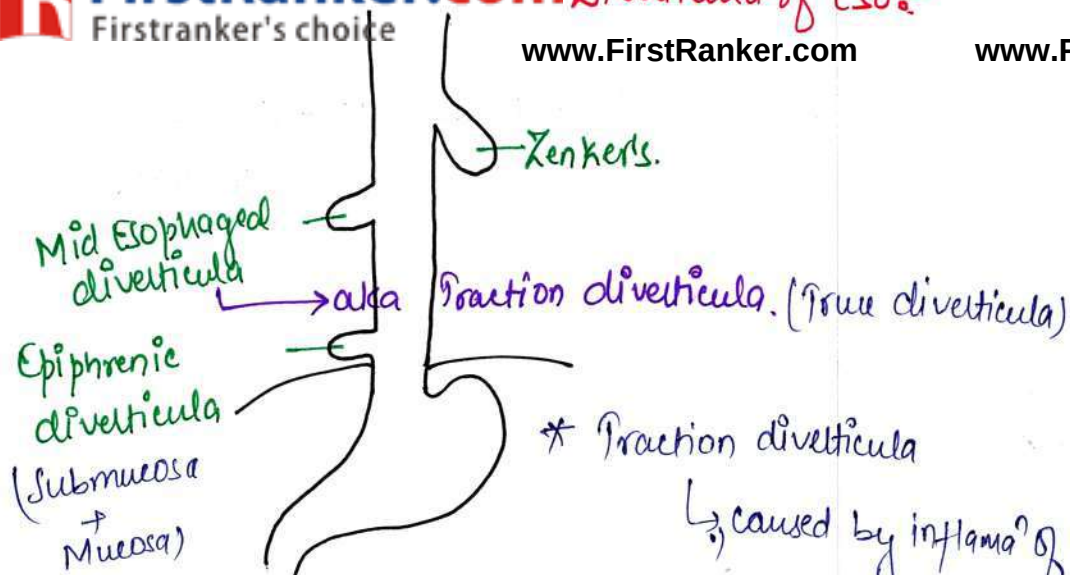


- * 90° Anterior fundoplication :- **WATSON** (not performed)
- * 180° " " :- **DOR** (performed)
- * 270° posterior " :- **SOUPET** (performed)
- * 270° Anterior " :- **BELSEY MARK IV** (not performed)

* Dor & Soupet are partial fundoplication.

⇒ **UPPER ESOPHAGUS :-**





* Traction diverticula

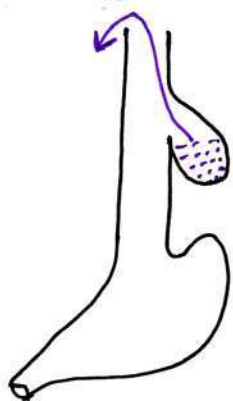
↳ caused by inflamaⁿ of LM in TB & Histoplasmosis

↳ It contains all the 3 layers (Mucosa, Submucosa, Muscularis)

↳ True diverticula.

ZENKER'S DIVERTICULA

- MC diverticula of Esophagus.
- false diverticula (only Mucosa)
- Elderly DM Male.



cf: initially pt. are asymptomatic

- Halitosis.
- Reflux
- Regurgitaⁿ
- Aspiraⁿ

↓ LIT

pneumonitis

↓

Lung Abscess: MC complicaⁿ

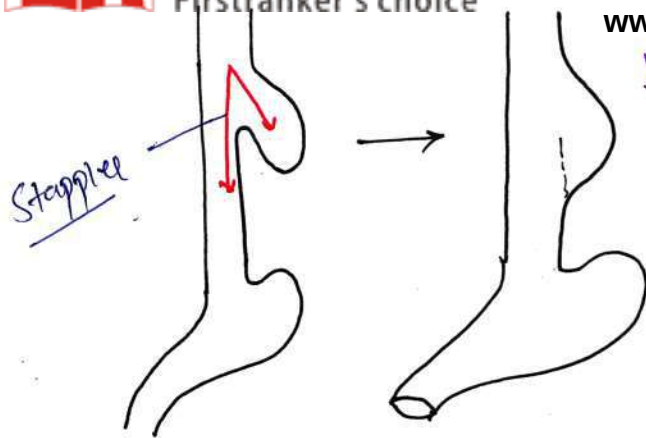
↳ ↑ Risk of Sq. cell ca

DOC: Ba. Swallow

Rx: DOC: Esophagomyotomy + Diverticulopexy

Alternative Rx: Diverticulectomy

↳ (diverticula is sutured in prevertebral fascia)

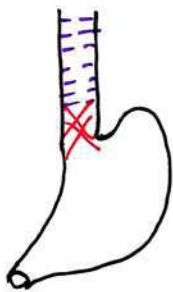


DIVERTICULO ESOPHAGOTOMY - DOHLMAN'S PROCEDURE.

ACHALASIA (fail to Relax) → LES

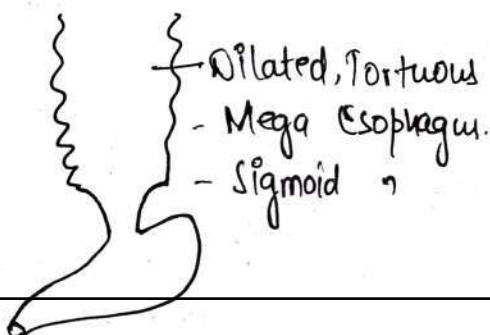
- Q - MC motility disorder of Eso. - Achalasia
- Q - MC Hypomotility " " " - "
- Q - MC Hypermotility " " " → Nut cracker

- * Absence of LES Relaxation
- * Etiopathogenesis: Selective loss of inhibitory Neuron of Auerbach plexuses caused by
- * 2° pathology: Absence of peristalsis in Esophagus or ineffective contraction.



- MC Symptom: Dysphagia > wt. loss (liquid > solid)
- It's also ↑ risk of Aspiration & pneumonia

↓
lung abscess & ↑ risk of Sq. cell ca.



- Dilated, Tortuous
- Mega Esophagus
- Sigmoid "

LES

- ① Absence of LES Relaxaⁿ
- ② ↑ LES pressure

~~Esophageal~~ Esophageal body

- ① Absence of peristalsis
- ② In-Effective contracⁿ
- ③ ↑ Intra- Esophageal pressure

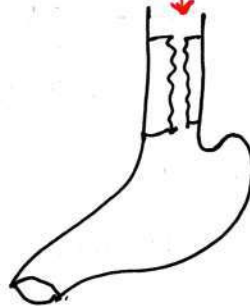
* On. Barium Swallow:-

- Bird-beak 
- Pencil-tip 
- Rat-tail 

Achalasia

Carcinoma Esophagus

(Rat-tail filling defect)



Mx: ① Drugs:-

1) CCB

2) Nitrates.

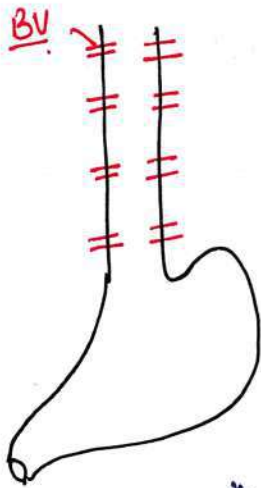
② Isoniazid 1) Botox injecⁿ

③ BOUGIE Dilataⁿ
Metalic

④ Balloon Dilataⁿ

Rx:- LAP. MODIFIED HELLER'S CARDIOMYOTOMY :- Myotomy is extended till Cardia

1) After Heller's myotomy → Partial fundoplicaⁿ is done to prevent Reflux.
↳ DOR or Tupper



Blood supply of ESO:-

Neck:- Inferior thyroid artery

Thorax:- Bronchial artery

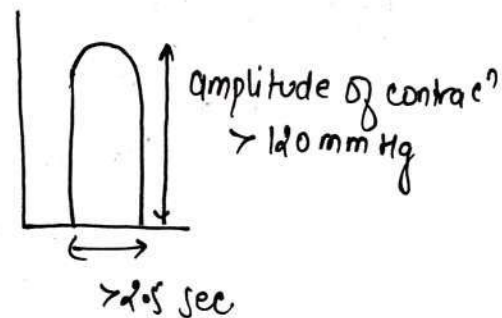
↳ Direct Branch from aorta.

↳ Inferior phrenic artery

↳ Aortic Gastric artery

* Symptoms:- Chest pain & dysphagia

Doc:- Manometry.



Ba-Swallow:- Cork-screw app.

Rosary app Beaded app.

Pseudo diverticulo. app.

Rx:- ① CCB/Nitrate $\rightarrow$ for non-Responding pt-

$\downarrow$ do

ESOPHAGOMYOTOMY

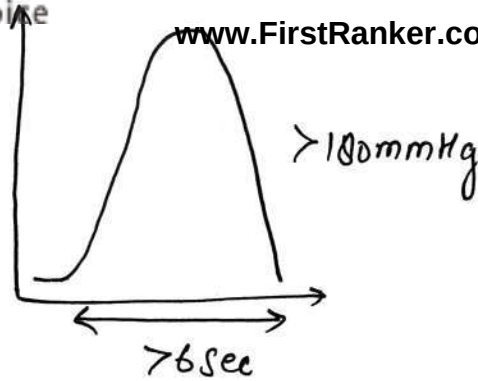
NUT-CRACKER'S ESOPHAGUS.

↳ MC type of Hypermotility disorder of ESO.

↳ Most painful Motility disorder of ESO.

clf:- chest pain & dysphagia

Doc:- Manometry.



Rx :- CCB / Nitrates
 ↓ not Responding
 Esophagomyotomy

Ca. ESOPHAGUS.

- MC Ca. Eso. Worldwide :- Sq. cell Ca.
- In Western country :- Adeno. Ca.
- MC site of Adeno. Ca. :- Lower 1/3rd
- MC site of Sq. cell Ca :- Mid. 1/3rd
- MC site of Ea. Esophagus :- Mid 1/3rd

Sq. cell Ca

- Alcohol
- Smoking
- Intake of Nitrite, Nitrate, Nitrosamine
- fungal toxin
- Xerker's diverticula
- Achalasia Cardia
- Castic injury (Intake of Acid/Alkali)
- Plummer Vinson synd.
- HPV 16, 18, 31, 33

• Pylosis palmaris-
 et-plantaris.
 ↳ Keratoconthoma
 in Palm & sole

- Bulimia Nervosa
- Deficiency of
 MO :- Molybdenum

X - Zinc

A - Vit. A

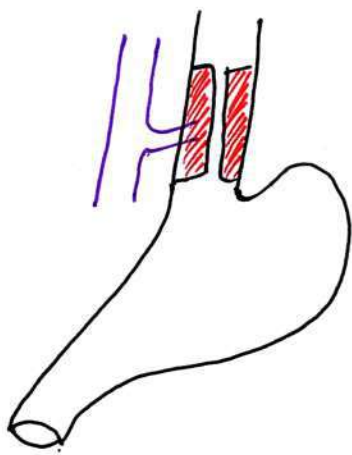
Adeno. Ca

- ① GERD
- ② Barrett's
- ③ Obesity
- ④ Scleroderma.

- 1) Age :- 5th / 6th decade
- 2) MC site to Mets :- LIVER
- 3) Chemotherapy Regimen :-

E - EPIRUBICIN
C :- CISPLATIN
F :- 5-FU

} same for Ca. Stomach also.



Symptoms :- MC :- dysphagia > wt-loss

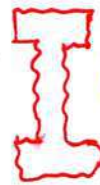
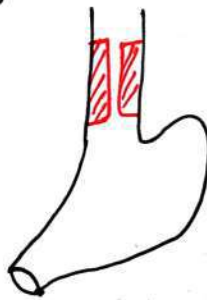
↳ progressive dysphagia,
initially to solid > Semi-Solid > liquid.

- Malignant T-E fistula :-
C/O, choking

- 1) Coughing cyanosis
- 2) Dyspnea.

Ix :- 1st Ix in Suspected Case of Ca. Eso :-

- ① Bq. Swallow ✓
- ② Endo + Bx - Doc
- ③ Endoscopic USG
- ④ CECT
- ⑤ PET SCAN



Apple Core app.
↳ also seen in Ca. Colon.

* Doc :- for staging of Ca. Eso :- Endoscopic USG. ↓ finding

* If lumen is obstructed & Ca. completely
then Doc for staging of Ca. Eso :- CECT



* for GI Malignancy 1cm margin is taken during Resecⁿ except:-

- (i) Eso. Ca :- 10cm margin taken
- (ii) Distal Rectum :- 2cm margin taken ca.

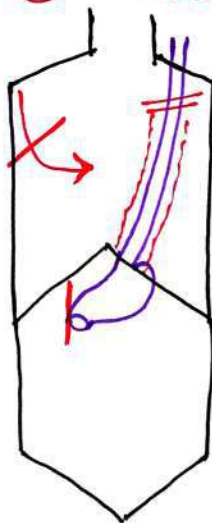
* During wide local Excision for Sq. cell Ca., Basal cell Ca., Malignant Melanoma and Soft tissue Sarcoma :- 2cm margin taken.

* During wide local Excision in Breast Conservⁿ 1cm margin taken.

* Types of Esophagectomy :-

- (i) IVOR-LEWIS OPERAⁿ
- (ii) ORRINGER TRANS-HIATAL ESOPHAGECTOMY
- (iii) MCKEON EN-BLOC ESOPHAGECTOMY.

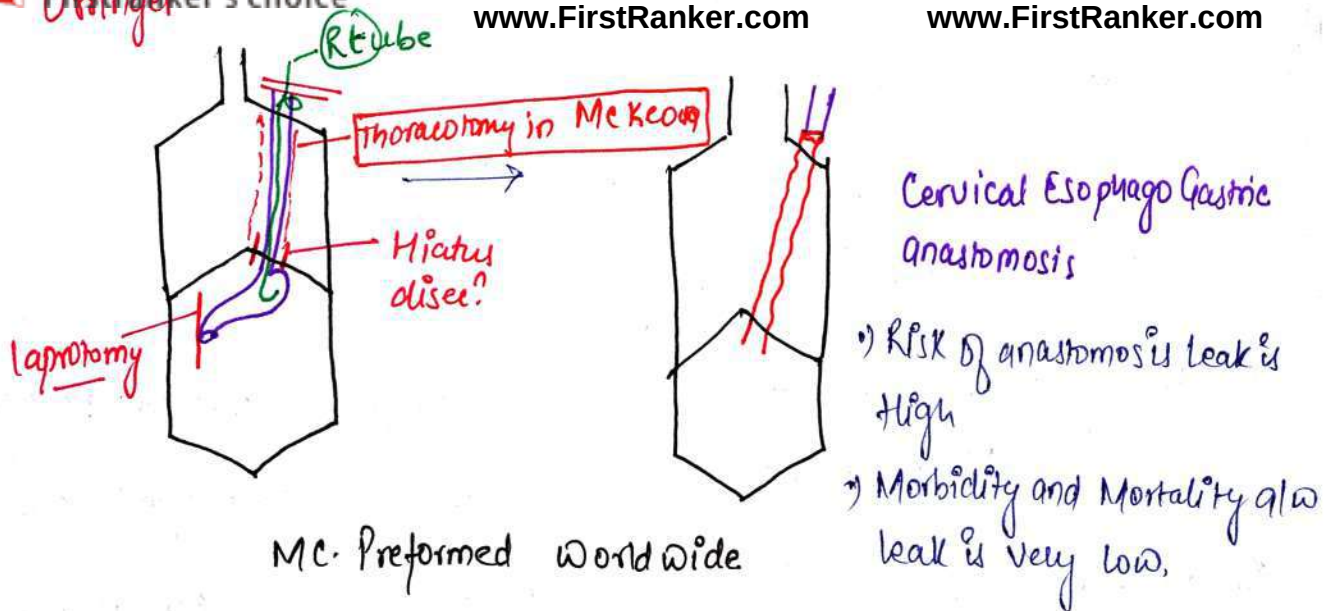
(i)



INTRATHORACIC ESOPHAGO-GASTRIC ANASTOMOSIS.

* Chances of Anastomatic leak is low but morbidity and mortality are High

* Mcc of death in Ivor Lewis operaⁿ :- Anastomatic leak.



- (11) **McKEON** :-
- *) MCC death :- Pneumonia (Pulmonary complication)
 - *) Lowest Risk of Recurrence

*) MC used. conduit after Esophagectomy :- Stomach > (L) Colon > Jejunum

*) IDC for Malignant I-E fistula :- SEMS stent
(Self Expanding metallic stent)



*) MCC of Eso. perfora :- Patrogenic (Endoscopic)
Mc site :- posterior wall of Cricopharynx

- Repeated Vomiting
- forceful vomiting
- Vomiting against closed glottis

→ Me site of Perforaⁿ:- ① posterolateral in lower 1/3rd of Eso.

→ Mackler's Δ:- Thoracic pain

- Vomiting
- Cervical subcutaneous Emphysema

Rx:- Loc:-

① Ba. Swallow

② Water Soluble Contrast Esophagogram. ✓

↳ Dye used:-, Gastrografin

• HYPAQUE

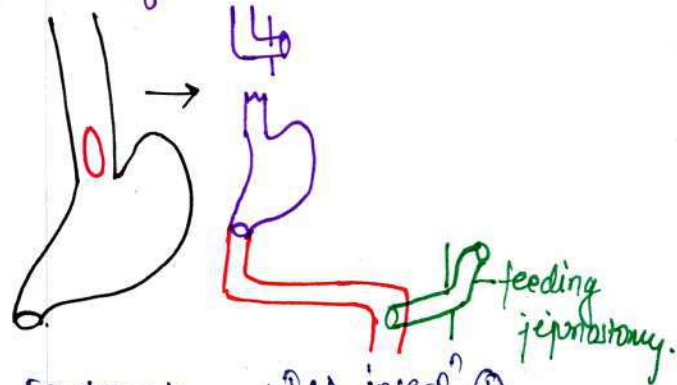
R:- pt. come in 24hr



- Repair of perforaⁿ + ICD inserⁿ
+ feeding jejunostomy.

Mortality:- 20%

pt. come after 24hr



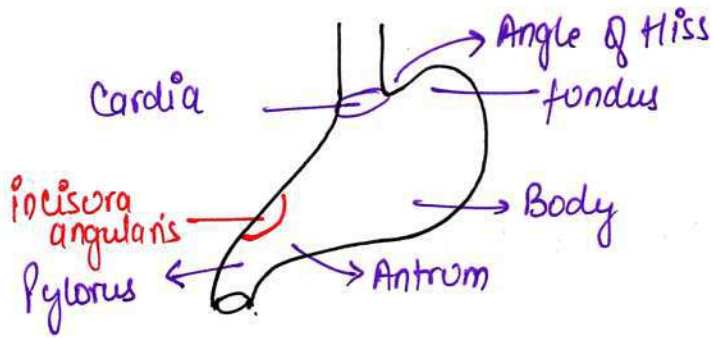
* Esophagostomy + ICD inserⁿ ⊕

feeding jejunostomy

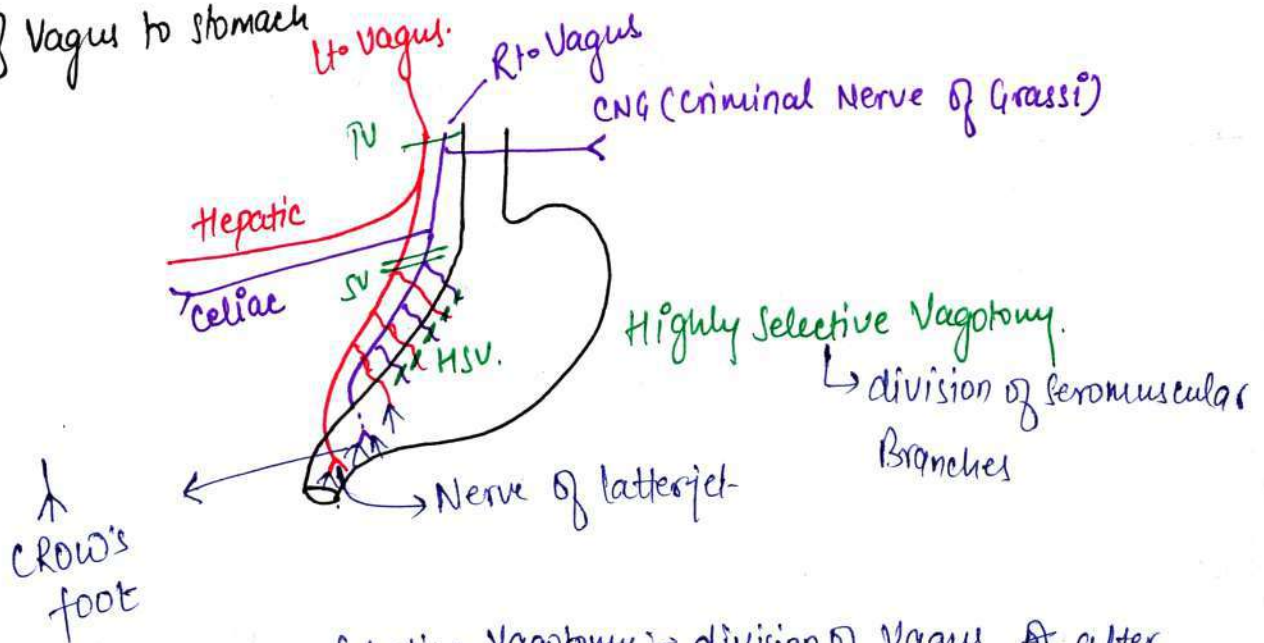


closer of Esophagus performed
after 3-4hr

Mortality >50%



* Relaⁿ of Vagus to stomach



Selective Vagotomy :- division of Vagus ~~of~~ after Hepatic and celiac Branch

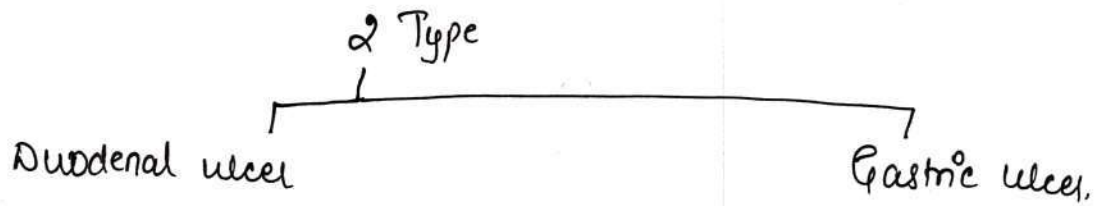
Truncate Vagotomy :- division of Main trunk of Vagus.

* HSV :- is also maximum Recurrence and Minimum morbidity

* TV :- is also Minimum Recurrence and Maximum morbidity.

Q :- Rec for intractable (not able to heal by Medicine) duodenal ulcer :- HSV
Rec n Recurrent duodenal n TV

GASTRIC ULCER

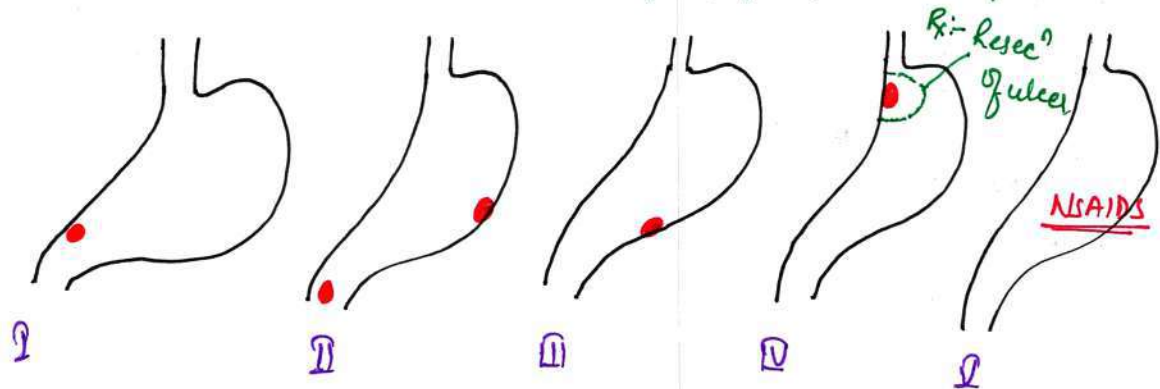


1) H. pylori responsible :- 90%
for

75%

2) MC site :- 1st part of duodenum.

* MODIFIED JOHNSON'S CLASSIFICATION FOR GASTRIC ULCER



I :- Located near Incisura Angularis - also Blood group 'A', MC type

II :- Two ulcers:- One in Body and One in 1st part of duodenum.

III :- Prepyloric ulcers

IV :- High on lesser curvature.

V :- NSAID induced ulcers.

also Blood group 'O'

* I & IV :- also low acid produce?

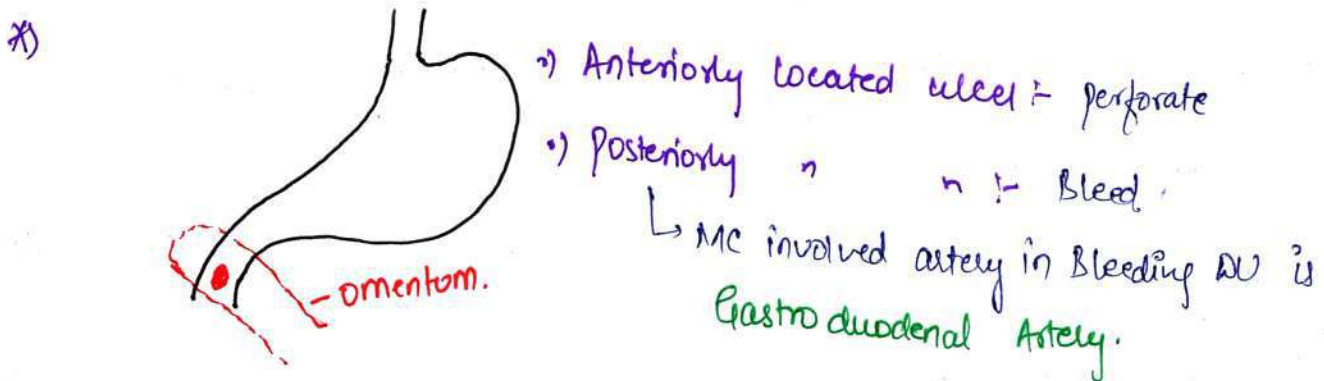
* II & III :- also High acid produce?

- ① Type 1:- Distal Gastrectomy
- ② I & II:- Truncal vagotomy + Antrectomy
- ③ ^{PGI} III:-
 - CSEDES
 - POUCHET
 - KELLING - MADLENER
 - SHOE - MAKER
- ④ IV:-
 - STOP N SAID

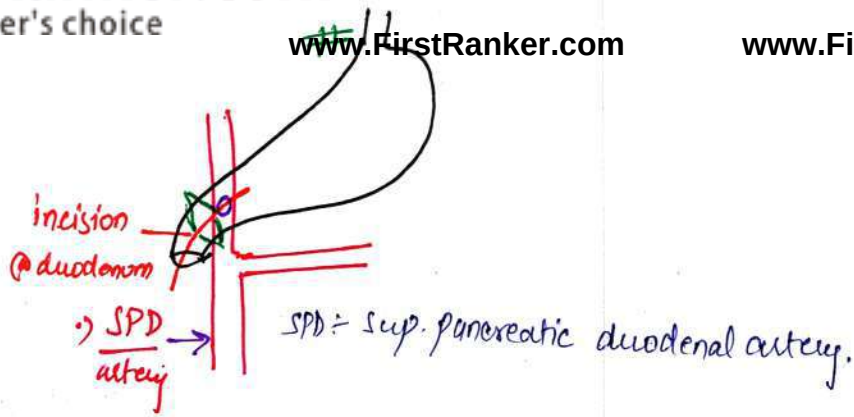
* Complicaⁿ of DU:-

- ① Intractability
- ② Perforaⁿ
- ③ Bleeding
- ④ Gastric Outlet Obstrucⁿ

* Intractable DU:- To c H.S.U.



* Rx of perforated DU:- Omentum patch Repair KLA Modified Graham's Repair



* Bleeding DU :- Duodenotomy + Liga' of Bleeding Vessel +
Truncal Vagotomy + Pyloroplasty

* Truncal Vagotomy s/b performed to prevent Risk of Re-Bleeding and Recurrence ∵ it ↓ acid output

Q. Q * Mcc of Gastric Outlet Obstruction :- Ca. Gastric (World wide)

* Mcc of GDO in India :- Ca. Stomach.
(TB is rare)

* Mc site of GDO caused by PU :- 1st part of duodenum.

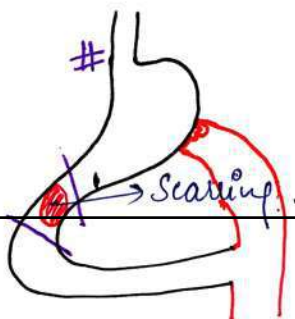


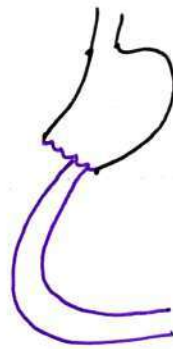
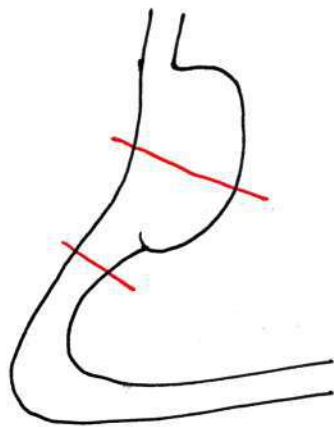
* Mx of GDO caused by PU :-

- ① put 2 large bore IV cannula.
 - ② start IVF :- fluid of choice :- NS.
 - ③ put RT and perform lavage.
 - ④ pt. s/b NPO for 48 hr
 - ⑤ Most pt. improved.
- ↓ for non responding pt.

Roe :- TV + Antrectomy

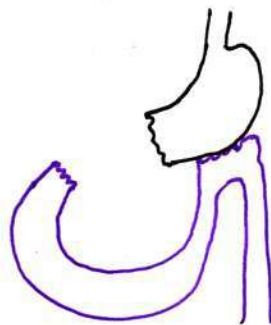
Alternative R :- TV + Gastrojejunostomy in case of Massive fibrosis @ Scarring.





Billroth-I

Gastro-duodenostomy



Billroth-II

Loop-Gastro-jejunostomy



Roux-Y.

* Dumping synd:- It is constelaⁿ of post-prandial symptoms caused by ACCELERATED EMPTYING OF HYPEROSMOLAR CONTENT into proximal part of small bowel.

- 15-30 minute of meal.

- Third space loss



Hypovolemia,

Mx:- Lie the pt. supine
⊕
IV fluid.

- 2-3 Hour after meal

→ ↑ Insulin Release
↓ cause

REACTIVE HYPOGLYCEMIA 4

Rx:- Oral Glucose.

* Prevention of dumping synd:-

① Dietary modification:- 1) Low carbohydrate, high fat, high protein diet.

2) Small frequent meal.

3) Avoid liquid during meal.

4) Avoid high calorie meal.



>75% pt. improves by this modification.

② Octreotide :- ↑ secre^d from jejunum and Insulin Release



>99% pt. improves.

③ Sx :- Convert Billroth II into Billroth I.

Q:- MC Metabolic Complicaⁿ of Gastrectomy:- Iron deficiency Anemia.



Rx:- Oral supplementⁿ of Iron. ∵ it has Fe²⁺ in these tabs

Q:- >50% of stomach is removed → Megaloblastic Anemia.

Rx:- parenteral supplementⁿ of B₁₂ for life long.

Rif:- (i) Nutritional :-
 1) low fat diet (dietary fibre)
 2) High complex carbohydrate intake
 3) Intake of Nitrate
 4) Smoked food

(ii) Social factor :- Low Socio-Economic Status.

(iii) Environmental factor :-
 1) Lack of Refrigeration :- H. pylori killed in low temp.
 2) Use of well water
 3) Smoking

(iv) Medical :-
 1) H. pylori
 2) EBV. infec.
 3) H/o Gastrectomy
 4) Adenomatous polyp.
 5) Menetrier's D's.

(v) Occupational :- 1) Rubber and Coal worker

(vi) Genetic :-
 1) Male Gender.
 2) Blood Group A
 3) HNPCC
 4) Pernicious Anemia
 5) Li-fraumeni synd.

* ALCOHOL IS NOT A RISK FACTOR

Protective for stomach.
 S :- Selenium
 I :- Iron
 Z :- Zinc

MC mutaⁿ in ca. stomach :-
 p53 > Cox-2

A :- vit. A / Aspirin (NSAIDs)

C :- vit. C / Ca⁺⁺

Type I :- Diffuse polypoidal Growth.

II :- ulcerated lesion $\bar{c}$ Raised Border

III :- ulcerated lesion $\bar{c}$ infiltrating the Gastric Wall

IV Linitis plastica

v Non classifiable

Q Q Q

* **LAUREN'S** CLASSIFICATION

Intestinal

- Environmental Rlf
- MC in Male
- Age :- 5th - 6th decade
- spread :- Hematogenous
- well defined Gland forma?

Diffuse

- familial Rlf
- MC in ♀
- Age :- Young
- Lymphatic $\odot$ or Transmural spread
- poor Gland forma?



Nucleus.

SIGNET-RING (Most dangerous Variety)

P16, P53 muta?

- APC Gene muta?

- Epidemic (Most of place)

+ E-Cadherin.

- Endemic

* **SIEWERT'S** Classifica? :- is used for GE junction tumor.

*) MC in Male

*) Seen in 5th/6th decade

*) MC site :- Antrum.

*) MC site of Ca. Stomach in Pernicious Anemia :- fundus.

MC malignancy
in India :-
Oral Ca.

*) MC malignancy in South India :- Ca. Stomach

*) MC malignancy in India :- Oral Ca.

*) Chemotherapy Regimen for Ca. Stomach :-

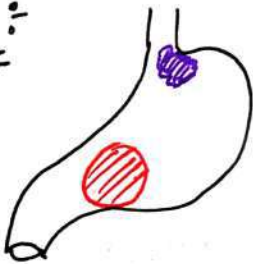
E :- Epirubicin

C :- Cisplatin

F :- 5FU

*) MC site of Mets :- Liver

*) Cf :-



1) MC :- Abd. pain > Wt. loss.

*) for GE juncⁿ Du. MC symp :- Dysphagia

*) Linitis plastica (Leather bottle stomach) :- Diffuse submucosal fibrosis.

↓
Stomach loses the capacity of distensibility
↓
Early satiety.

*) Involvement of Lt. Axilla LN :- IRISH Node

*) Cutaneous Metastatic deposit around umbilicus :- Sister Mary Joseph Node

*) Lt. Supraclavicular LNopathy :- Virchow's Node (TROISER'S SIGN)

*) BLUMMER'S SHELF :- palpable Intra peritoneal metastasis on DRE.

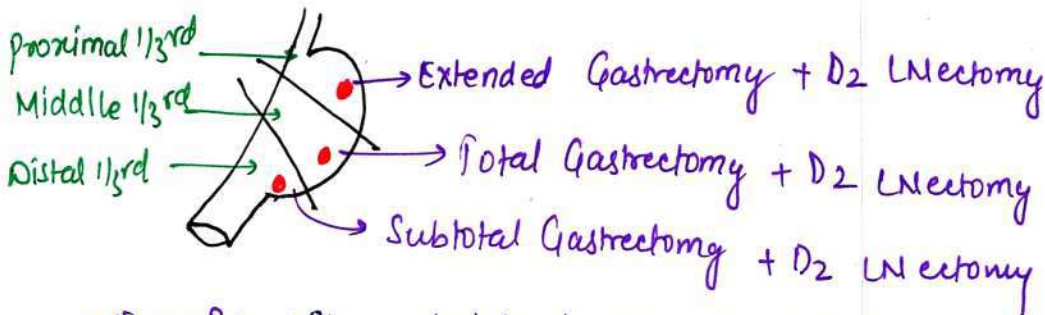
* Other Route of spread:- (Retrograde LN spread MC)

- 1) Hematogenous
- 2) Transcoelomic / Trans-peritoneal

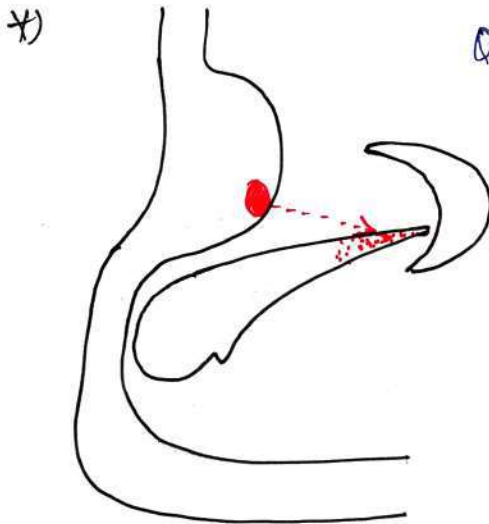
* Doc for Dx of Ca. Stomach:- Endoscopy + Bx

* Doc for staging:- Endoscopic USG

* Rx:-



* Excepⁿ:- Diffuse Variety involving Distal 1/3rd of Stomach :- Rx is Total gastrectomy + D2 lymphoectomy.



Q:- indicaⁿ of Distal pancreatectomy is direct involvement of Body (or) Tail of pancreas.

Q:- Indicaⁿ of spleenectomy :- Ca. Stomach located in proximal part along greater curvature or posterior wall.

Q:- Direct-infiltraⁿ of spleen

- Gastrointestinal Stromal Tumor

- 1) MC site :- Stomach > SI > Colon - Rectum > Esophagus
- 2) Arises from :- Interstitial Cell of ~~Kajal~~ ^{Kajal} (Gastric pacemaker)
_{express}
- 3) Tyrosine-Kinase Receptor :- C-KIT (CD-117)

- Bcl

- CD-34

Q - PDGFRA :- platelet-derived growth factor Receptor Alpha :- 5% Tumor express
 ↳ if this express on Tumor
 ↓
 Having favorable prognosis.

1) DOG-1 :- detected on GIST-1

2) Protein Kinase C Theta

3) Type of GIST :-

① Spindle cell (70%)

② Epithelioid cell (30%)



CA - Stomach



GIST

Extra Mural

(CA - arise from epithelium)
 (Sarcoma - arise from Mesenchymal)

Clf:- In initial stages pt. asymptomatic

- 1) MC presentation :- Emergency Bleeding
- 2) MC Route of spread :- Hematogenous.

lymphatic spread not seen. not also (N mets).

* I/O :- $\rightarrow$ CECT

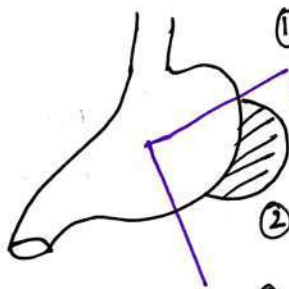
for Asis $\rightarrow$ Endoscopic Bx is CID $\because$ it can diff. Rupture

* CECT :- for Extra luminal condiⁿ of GIT in abdomen.
loc

eg:- $\rightarrow$ GIST

- $\rightarrow$ Mesenteric Cyst
- $\rightarrow$ Diverticulitis
- $\rightarrow$ Intra abdominal collecⁿ
- $\rightarrow$ Abscess.

R:-



① $\rightarrow$ Resectable Tumor

$\rightarrow$ Wedge Shape Excision Segmental Resecⁿ $\geq$ 2 cm Margin

② $\rightarrow$ On Resectable Tumor:- Imatinib Mesylate

③ $\rightarrow$ Imatinib Resistant GIST :- Sunitinib.

④ $\rightarrow$ PET SCAN:- used to monitor Response of therapy

* GOLD Std Tx for Asis of Recurrence GIST:- PET-CT.

* CARNEY'S A:- ① Multifocal GIST

② Pulmonary chondroma

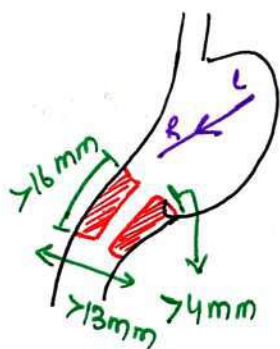
③ Extraadrenal paraganglioma.

~~X~~ HPS

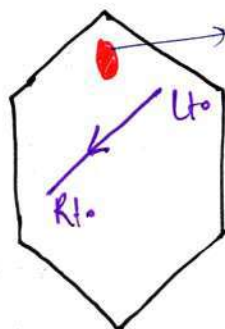
I HPS

- Acquired
- Incidence:- 1:3000-4000 live Birth.
- caused by:- Hypertrophy of circular m's fibre
- child (N) @ time of birth.
- Age of presenta:- 4th-6th week after birth
- 1st born Male are Mc affected.

R.H:- familial History.



- characterized by:- Multiple Episode of Non-bilious projectile / Non-projectile Vomiting

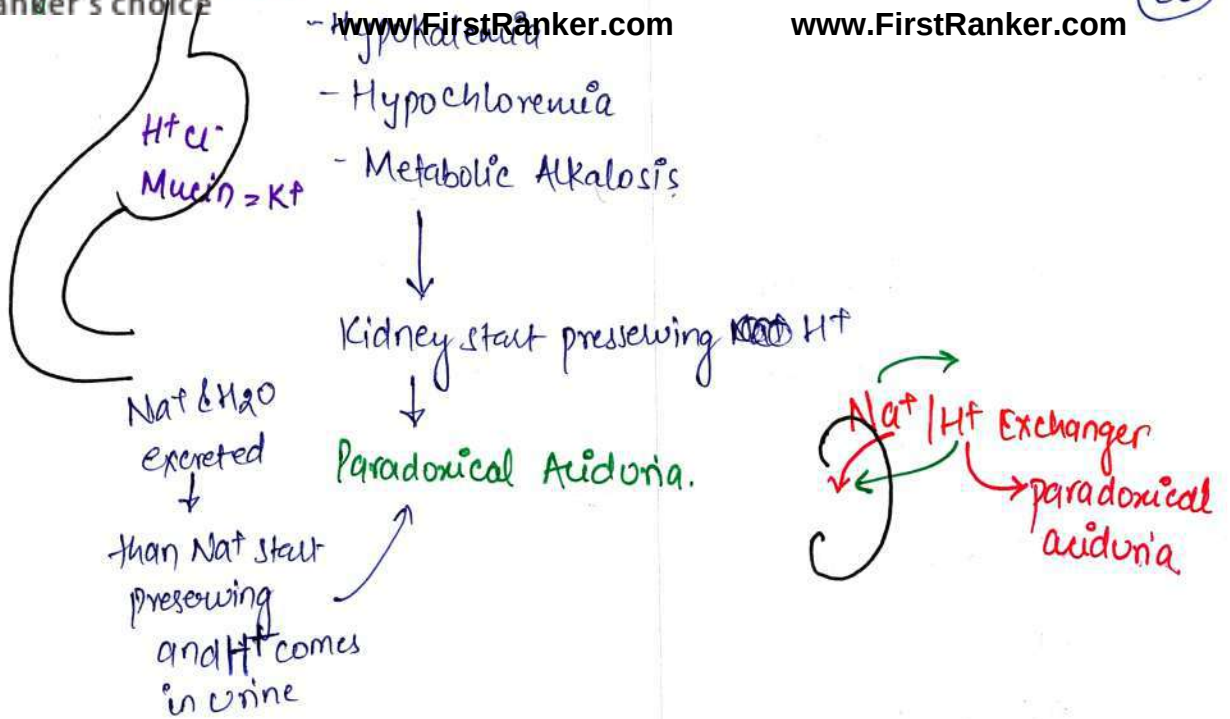
Direcⁿ of peristalsis :- Lt to Rt.

I OC:- USG:- Diagnostic Criteria:-

- (i) pyloric m's thickness:- $>4\text{mm}$
- (ii) channel length :- $>16\text{mm}$
- (iii) Transverse diameter:- $>13\text{mm}$

On Ba. Meal:-

- (i) string sign
- (ii) shoulder sign
- (iii) Double Tract sign



Rx:- Type of Medical Emergency:-

1st :- Correcⁿ of Hypovolaemia and dyselectrolytemia.

fluid of choice :- NS

Roc:- RAMSTEDT-FREDET PYLOROMYOTOMY

* **FOREST CLASSIFICATION** Based on Endoscopic finding :- to predict Re-Bleeding

Risk :-

for upper GI Bleeding

Type Ia :- Active Pulsatile Bleeding

Ib :- Oozing

IIa :- Non-Bleeding Visible Vessel

IIb :- Adherent clot. — Intermediate Risk

IIc :- Black clot. — Low Risk

III :- Clean Base

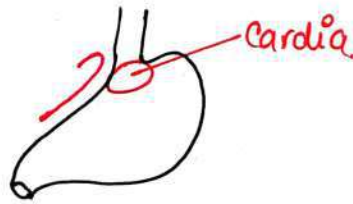
High Risk of Re-Bleeding

Low Risk

- 1) Partial tear involving Mucosa and Submucosa located just below GE juncⁿ.

Mc site :- ① Esophagus

② Stomach ✓



- 2) Cause :- 1) Multiple Episode of Vomiting

1) Repeated Vomiting

2) forceful Vomiting.

3) Retching (Alcoholic)

→ Alcoholic & Male.

- CLF :- 1) Bleeding is Minor in Majority

2) Painless condiⁿ

3) Massive Bleeding occur in 20%.

4) Mc artery Responsible for Bleeding :- **GA - Gastric artery.**
(Largest artery supplying Stomach)

Rx :- 1) Conservative Mx

2) Bleeding stops in majority

① Endoscopic Electrocoagulaⁿ

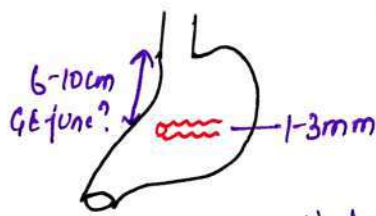
↓ NA / fail

Angio + Embolizaⁿ

↓ NA / fail.

Open sx Ligaⁿ

* Use of Sengstaken Bleed u c/I



1) Large arteriole

- diameter:- 1-3mm

- located near lesser curvature in 6-10cm GE junction?

2) Location of arteriole:- just below Mucosa.

3) Wall is damaged by acidic environment.

↓ if

active pulsatile Bleeding.

C/f:- Hematemesis

(ii) Recurrent Hypotension.

Rx:- Endoscopy + Electrocoagulation

↓ NA/fail

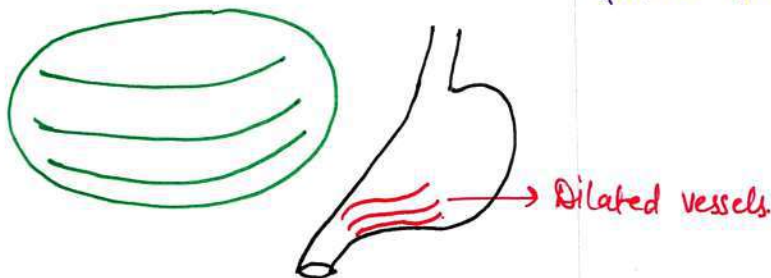
Angiography + Embolization

↓ NA/fail

Open sx ligation.

→ WATER-MELON STOMACH (GAVE)

Gastric Antral Vascular Ectasia.



1) MC site:- Antrum

2) pathology:- Vascular Ectasia

3) On Endo:- parallel strips near antrum → looks like covering of water Melon.

4) C/f:- Elderly ♀

5) 25% pt :- Ch. Liver d's.

Anemia
↓
fatigue

Doc: Endoscopy + Bx

Roc: Endoscopic Electrocoagula?

Ectasia @ arterio venous junction?

PERITONEUM

PERITONITIS.

- ① Spontaneous Bacterial Peritonitis (SBP)
- ② 2° " "
- ③ Peritonitis in CAPD (Ch. ambulatory Peritoneal Dialysis)

* SBP :-

- Prerequisite :- Ascitis.

- MCC of Ascitis in Adult :- Cirrhosis

- " " " " children :- Nephrotic Synd.

pathogenesis

of SBP.

Bacteria in GUT

↓ Translocation

Mesenteric LN

↓

Ascitic fluid

* MC organism responsible for SBP :-

E. coli > Klebsiella

* In children :- Group A streptococci.

* SBP is Monomicrobial infect (single organism)

* Diagnostic Criteria of SBP on Paracentesis :-

① Monomicrobial growth $\bar{c}$ $N^{\circ} > 250/mm^3$.

↑ B $\bar{c}$:- Lymphocyte ↑

* C/f :- 1) diffuse abdominal pain $\bar{c}$ tenderness

1) tachycardia

1) fever $\bar{c}$ Rigor

* Rx :- IV Antibiotic (CEFOXIME) + ALBUMIN (in CLD & Nephrotic ↓ Albumin)

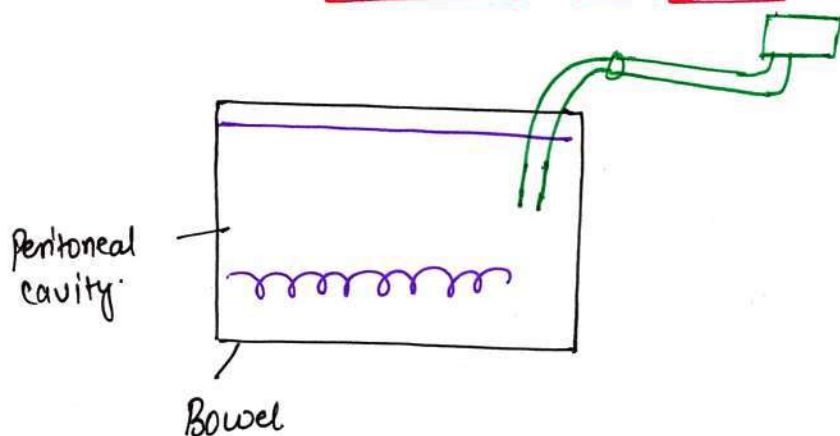
Secondary Bacterial Peritonitis:-

- Visceral perforaⁿ :-
- polymicrobial :- E. coli

Bacteroid fragilis.

R:- Exploratory laprotomy ⊕ Peritoneal lavage ⊕ Repair of perforaⁿ.

PERITONITIS IN CAPD



*) MC organism responsible for peritonitis in CAPD:- Staph. Epidermidis

R:- Intra-Peritoneal Instillaⁿ of 1st Generaⁿ Cephalosporine via catheter.

*) for Recurrent attack :- Change the catheter.

*) Most dependent cavity in lined down posiⁿ (or) supine posiⁿ:- Hepato Morison pouch aka Rto Sub Hepatic space.

*) Most dependent cavity in upright posture :- pelvis.

Q:- Most Common site of intra peritoneal abscess in supine :- Hepato Morison pouch

Q:- MC site of Intra Peritoneal abscess in upright posture :- Pelvis

Q:- Overall MC site of intra peritoneal abscess :- Pelvis.



Clt: pain in lower abd. & tenderness also Multiple Episode of loose stool & passage of Mucus

Also fever

- 1st Lx: USG

- Doc for Abs: CECT

- Rx: USG/CT guided per cutaneous Aspiration

Alternative Rx: ♀: posterior colpotomy

♂: Anterior Rectal drainage via anterior wall

MESENTERIC CYST

1) MC in ♀

2) Age: 1st-2nd decade

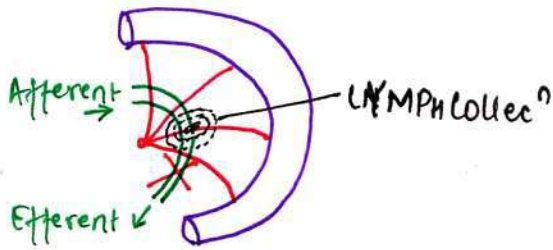
3) Type: MC: ① Chylolymphatic

② Enterogenous (2nd MC)

③ Simple or Mesothelial

④ Dermoid

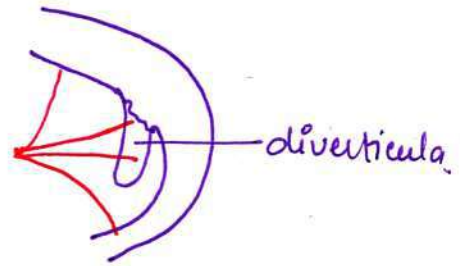
⑤ Arising from Urogenital Remnant.



1) IHS - caused by congenitally misplaced lymphatics seen in Ileum only seen Afferent and (no) Efferent.

2) Content - chylous.

3) Rx: Enucleaⁿ



1) Content - Mucinous having shared wall and shared vascular supply

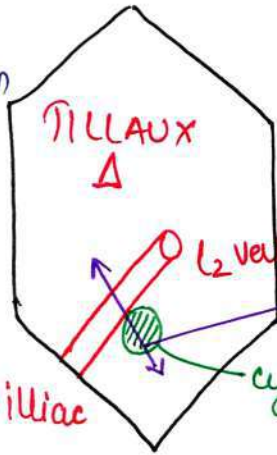
2) Rx: Resecⁿ & Anastomosis.

* PILLAUX Δ:-

* Soft fluctuating swelling in perumbilical ~~perpendicular~~ Region ⊕

Moving perpendicular to the attachment of Mesentry ⊕

Zone of Hyper-Resonance around the swelling



[Mesentry from L2 - Rt. Sacroiliac joint)

C/H:- Mostly asymptomatic present c abd. distention

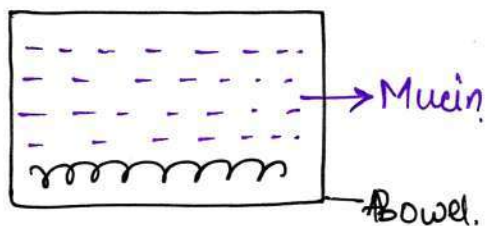
Doc:- CECT

Rx:- chylolymphatic :- Enucleaⁿ

Entero genous :- Resecⁿ & Anastomosis

PSEUDO-MYXOMA PERITONEI

- Caused by:- Mucinous Adenocarcinoma
- Mc 1°:- Appendix & Ovary

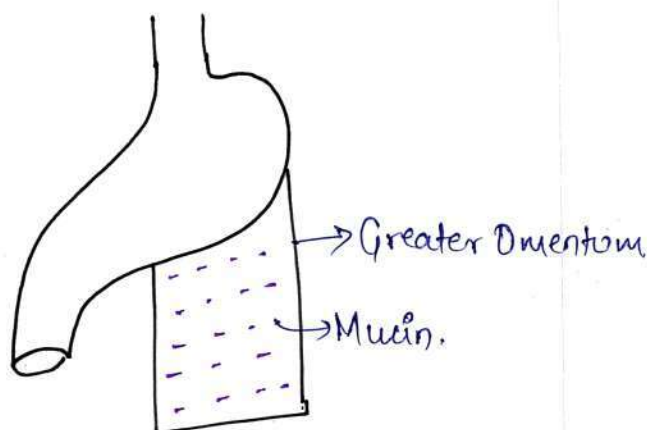


Clt:- Global detora' of Health & Abd. distention

- 1) a/w colicky pain after Meal.
- 2) Sudden app. of Multiple Hemia.

Doc:- CECT

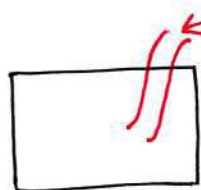
R:-



- Omentectomy + Peritoneectomy + Rt. Hemicolectomy

1) In ♀:- B/L Salpingoophrectomy slb added.

To prevent Recurrence:-



* HIPEC (Hyperthermic intraperitoneal chemotherapy) is given

- * indica:- ① Pseudomyxoma peritonei
- ② Peritoneal Carcinomatosis.

- It is proliferation of fibrous tissue in Retroperitoneum.

• Idiopathic Retroperitoneal fibrosis K/A:- ORMOND'S D'S

1) 2° Retroperitoneal fibrosis:- causes:-

① Ch. inflammation:-

C :- Ch. pancreatitis

A :- Actinomycosis

T :- TB

H :- Histoplasmosis.

② Drug:- Methylsergide. ✓

Bleomycin. → Pulmonary fibrosis.

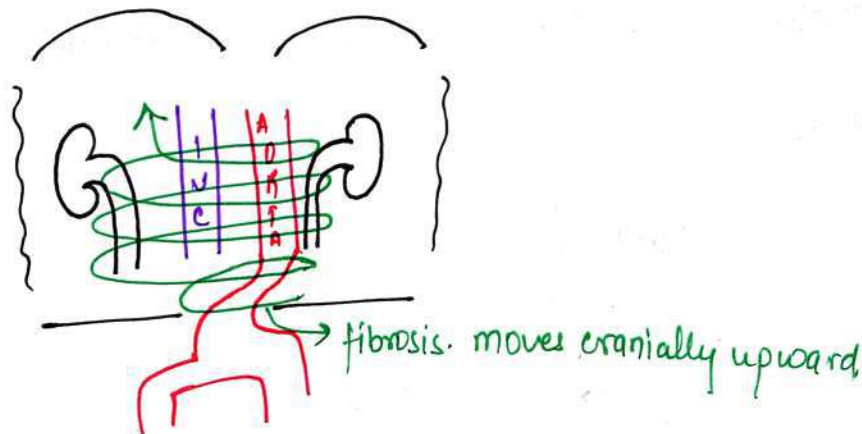
③ Auto immune disorder.

④ Malignancy :- NHL

Ca. Prostate

Carcinoid Tu.

⑤ Radiaⁿ Exposure.



1) Ureter > LVC > ADRTA

2) In Ureter Mc involved part :- LOWER 1/3rd

Clt:- Earliest & Mc symptom:- Non-specific dull aching back ache

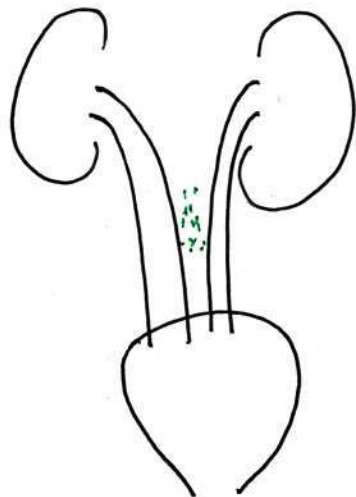
specific symptom:- Symptom of obstructive Uropathy:-

- (i) Dysuria
- (ii) fever
- (iii) Abd. pain.

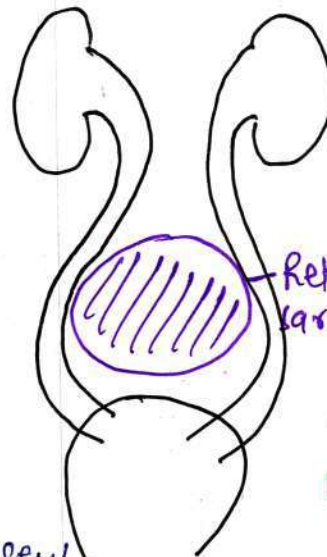
3) Ioc for Acis :- CECT
of RPF

4) On IVP :-

(i) Medial deviaⁿ of ureter aka (Pipe stem Ureter)

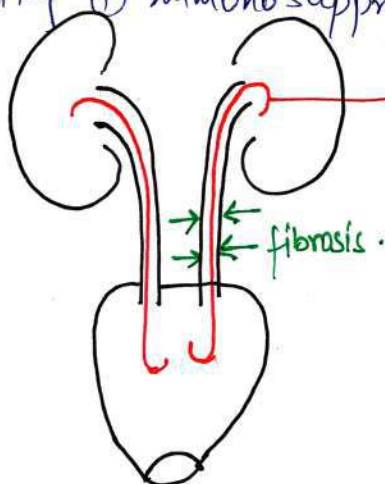


(ii)



Lateral Deviaⁿ of Ureter

Rp:- Idiopathic Retroperitoneal fibrosis
Ureteric stenting + Immunosuppressive agent.



D-J Stent.

T - Tamoxifen

A :- Azathioprine

P :- Penicillamine

S - Steroid.

INTESTINAL OBSTRUCTION

Q Mcc of large Bowel obstruct?

- ① Adhesion - Mcc of small Bowel obstruct?
- ② Malignancy ✓
- ③ Hernia
- ④ Crohn's

Small Bowel Obstruct?

- Mcc :- adhesion > Malignancy > Hernia > Crohn's (Mn-MHC)

- Maximum risk of adhesive intestinal obstruct? is seen in :- Pelvic sx > lower abd. sx > upper abd. sx.

Adhesion lt
sx



C/f :- colicky pain & Multiple episode of Bilious Vomiting
& non-passage of feces and flatus K/A
Absolute constipa? @ Obstipa?



* Major component of air in air fluid level

- ① O₂
- ② N₂ ✓
- ③ H₂
- ④ CO₂
- ⑤ H₂S

* Vomiting and electrolyte is MC in proximal obstruct? and abd. distension is MC in distal obstruct?

Bowel is sensitive to stretch and distension.

* Hyperactive On Auscultation:- Hyperactive Bowel sound during initial 4-6hrs

Rx:- ① put 2 large bore IV cannula ∵ pt. is having hypovolemia.

Start IV fluid of choice:- RL

② RT insertion for proximal loop decompression.

③ Foley's Catheterization for monitoring of urine output.

Best clinical indicator of tissue perfusion :- Urine Output

Minimum Urine output slb in healthy tissue perfusion:-

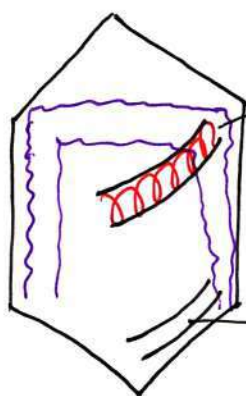
Adult:- 1ml/min

Children:- 0.5ml/kg - 1ml/min

Doc:- X-ray abd:- 2 views:- Supine > Erect-

- Erect:- Better for Air fluid level

- Supine :- Better for site of obstruction



Jejunum:- placed centrally upper / central abdomen having circumferential RING LIKE Pattern:- Valvulae conniventes

Ileum:- placed lower abdomen centrally featureless / characterless

Large Bowel:- placed peripherally wide in caliber Haustrations

* Gas in Rectum suggestive:- Partial obstruction

* Absence of gas in Rectum + Complete obstruction

- ① Adhesion :- Adhesiolysis.
- ② Malignancy :- Resecⁿ + Anastomosis
- ③ Hernia :- Reduceⁿ
- ④ Crohn's :- Resecⁿ + Anastomosis.

Post-operative Ileus.

- ① Stomach :- in 4hr
- ② SI :- ~~peristaltic activity~~ in 24hr
- ③ Colon :- in 3-5 days.

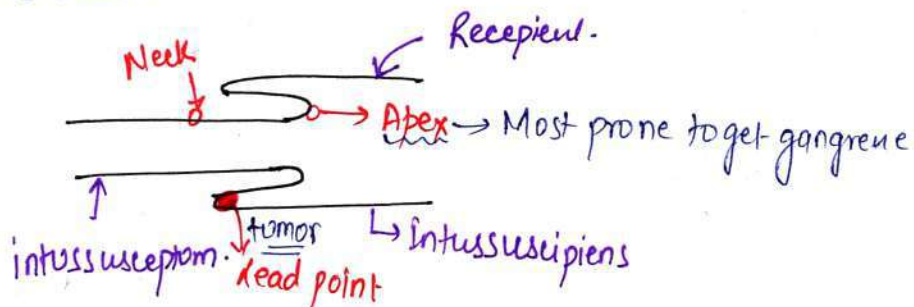
Q: Earliest activity is seen in Jejunum in 8hr.

#

INTUSSUSCEPTION

defⁿ :- Telescoping of one segment of Bowel into another.

- 1) MC in children
- 2) Age 1-4-10m
- 3) MC type :- Ileocolic
- 4) Adult :- Colocolic.



* Hypothesis :- during 4-10m of age child is prone to infecⁿ specially Rota virus diarrhea & Peyer's patch hypertrophy & intussuscepⁿ (Ileo-colic).

www.FirstRanker.com

Clt:- Abdominal discomfort

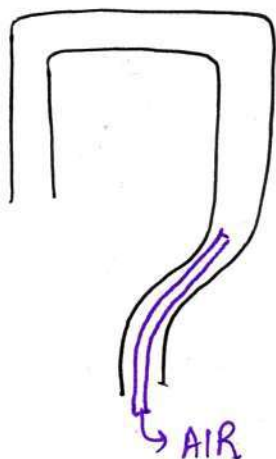
- Abd. distension
- No colicky pain
- On Auscultation:- Bowel Sound +ve

Rx:- DOC:- NEOSTIGMINE.

Precaution:- ① R/O out ② Ac. Obstruction

③ Cardiovascular complication

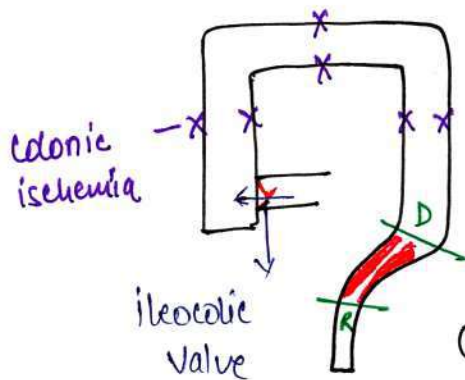
Alternative Rx:- flatus tube insertion.



- MCC:- Malignancy.

- Mc site of Large Bowel Obstruction:- Rectum > Sigmoid.

Adhesion:- Rarely Responsible for Large Bowel Obstruction.



* LBO:- is a type of close loop obstruction

It's a real emergency.

Sx shld perform as early as possible

CH:- Colicky pain in lower abd.

Non-passage of ^{feces} and flatus

Abdominal distension.

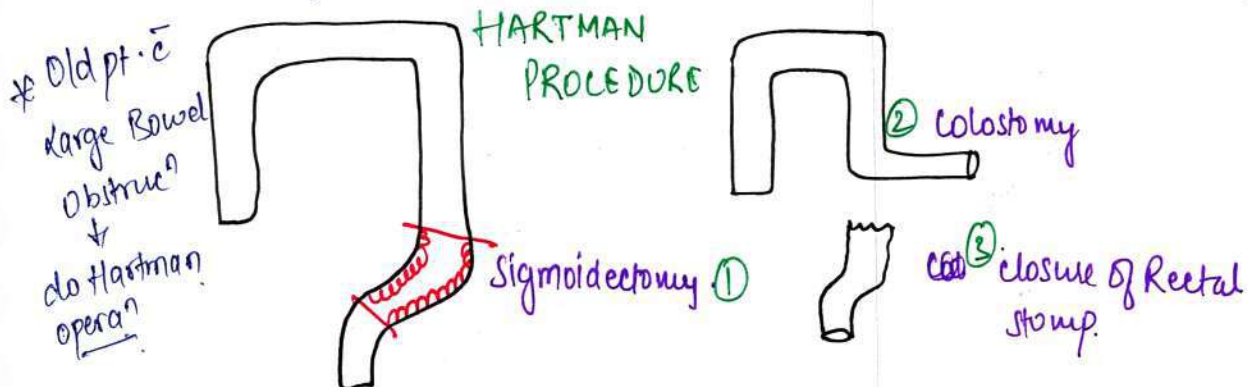
* Rx:-

① Rt. Colonic Malignancy :- Rt Colectomy (or) Rt. Hemicolectomy.

② Lt. " " :- Lt. Colectomy (or) Lt. Hemicolectomy.

③ SIGMOID COLON Malignancy :- ① Sigmoidectomy + Colorectal anastomosis.

If pt. come in 2-3 day ~~do~~ (X) ② Total colectomy + Ileorectal Anastomosis.



* * Rectal Ca. in upper 1/3rd :- Hartman can be done.

1) Located in Middle / Lower 3rd.

2) Rx:- Sigmoid colectomy flb chemo Radia? flb Iv. Resec? & Colostomy closure

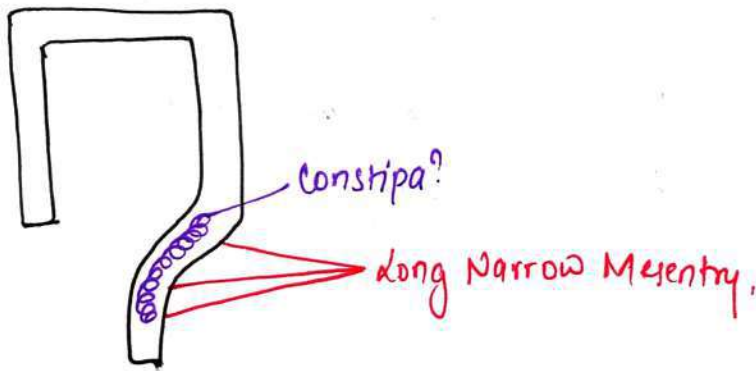
VOLVULUS.

SIGMOID:-

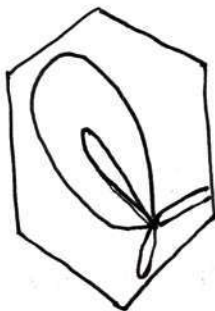
* Mc site:- Sigmoid colon.

* Both anti-clockwise / clockwise
 ↳ Mc

Cause:-



- Rlt:-
- (i) Old age
 - (ii) Hospitalized pt.
 - (iii) Mentally impaired pt.
 - (iv) Drugs:- Opiate, Anti-psychotic
- of constipa?



clt:- (i) Sign and symptom of large bowel obstruct?

Doc:- X-ray abd. :-

- Coffee bean
- Bent innertube
- Omega sign

Ba. Enema :- Bird-Beak

- Bird of Prey sign

- Ace of Spades sign.

Cardiac achalasia

Ba. swallow

↳ Bird-Beak

Cecal Volvulus.

Misnomer

→ Correct term: Ceco-colic Volvulus.

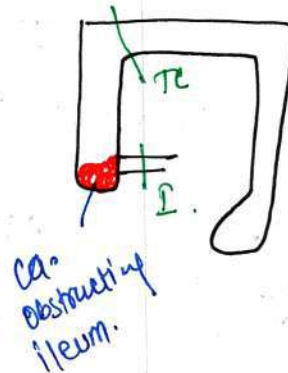
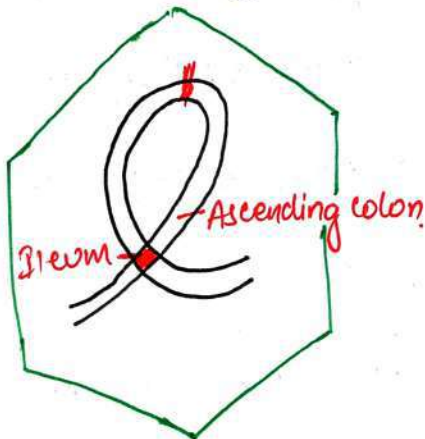
- MC: clockwise.

- predisposing factor: (i) Multipara pt → Release Relaxin ⊥ Relax the ligament.

(ii) H/o previously

(iii) Malrotation?

(iv) Distal obstructing lesion.



Clf: pt. + ↑↑ ⊥ sign and symptom of Small Bowel Obstrucⁿ

Doc: X-ray Abd: Kidney Bean Sign

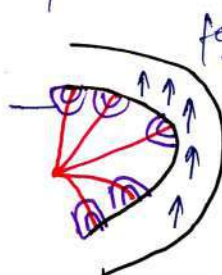


R:- Procolectomy ⊕ Ileotransverse Anastomosis

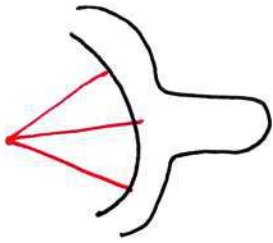
BOWEL DIVERTICULA

- applicable for Both Small Bowel and Large Bowel diverticula.

Mesentery
↓
Lympho-vascular supply.



feature → Most Bowel diverticula are qq., false, multiple, located along Mesenteric aspect.

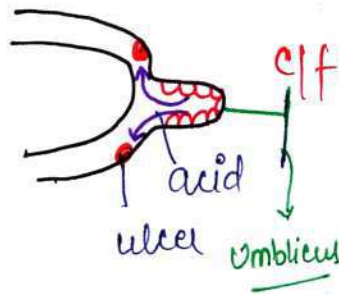


- Congenital
- True. (All 3 layers all +ve)
- Single
- Located along anti-Mesenteric aspect.

- It's MC congenital abnormality of Mid gut - caused by persistent Vitello-Intestinal Duct. (OMPHALO-Mesenteric duct)

- Rule of '2':-
 - 2% populaⁿ
 - 2 inch in length
 - 2 feet located proximal to Ileocolic juncⁿ
 - Symptomatic pt. are <2 Yr of age.

- Ectopic Mucosa +ve :- Gastric > pancreatic > colonic mucosa



cf :- Bleeding (Mc symptom)

Mc symptoms in Adult :- Abdominal pain

dit :-

- Diverticulitis

- Volvulus.

- Intussusception.

* Loc :- Tc⁹⁹ Scan

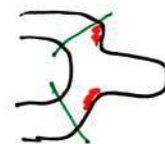
* Meckle's out Ectopic Gastric Mucosa :- Loc - Enterocolitis.

Rx :- Meckle's diverticulum w/ Healthy Base :- Diverticulectomy.

*) n n w/ Unhealthy Base :- Resecⁿ & Anastomosis.



*) Incidentally detected Meckle's diverticulum during Elective Sx s/b Removed in all the pt. upto 50 Yr of age.



*) A risk

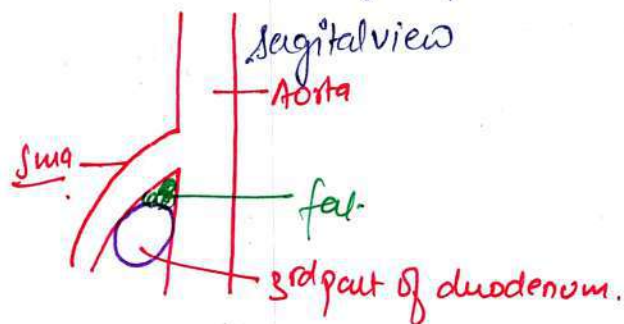
- ① Narrow Mouth
- ② Ectopic gastric Mucosa
- ③ Unhealthy Base.

Superior Mesenteric Artery synd.

aka. Wilk's Synd

↳ CAST Synd.

- Compression of 3rd part of duodenum by superior Mesenteric artery



Predisposing factor:-

- ① Rapid wt. loss.
- ② Rapid gain of Ht.
- ③ Tall thin adult
- ④ Cast applicaⁿ.

clt :- ① Colicky pain after meal & good passing of feces and flatus.

Doc:- EET ② Hypotonic duodenography.

Rxoc :- DJ-ostomy.

Rxoc :- Duodenal atresia } DD
Annular pancreas }

1) MC organism:- M. TB

M. Bovis :- Eliminated by Public Health Measure.

1) 1st Organ involved :- Lung.

1) GIT is involved after swallowing of infected sputum

1) MC site :- Ileocecal Region.

1) Earliest lesion (or) Earliest A's activity :- seen in Sub Mucosa of Bowel.

1) pathological types :-

① ulcerative

(60%)

1) Virulence of :- $\uparrow\uparrow$
organism

1) Immunity :- $\downarrow\downarrow$

1) Transverse ulcer.

Hyperplastic

(10%)

1) $\downarrow\downarrow$ Virulence

1) $\uparrow\uparrow$ immunity

↓
Strong inflammatory response

↓
Mesenteric LNopathy

↓
Caseous Necrosis

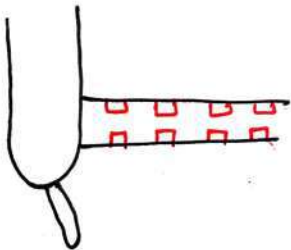
↓
Matted Bowel Loop.

Sclerotic / fibrotic

30%

1) Seen in ch. case

1) Multiple Stricture



Clt :- ① Initially non-specific symptom :-

1) Evening rise of temp

1) Low grade temp

1) Night Sweat.

1) Anorexia

1) wt loss

(iii) Mc presentⁿ of GI TB:- Sub acute Intestinal Obstrucⁿ (SAIO)



* On paracentesis:-

(i) Lymphocyte:- $> 800/\text{mm}^3$

(ii) protein $> 2.5 \text{ g/dl}$

(iii) SAAG < 1.0

(iv) $\Delta \text{Albumin} - \text{Acidic Albumin}$
 $3.0 - 2.5 = 0.5$

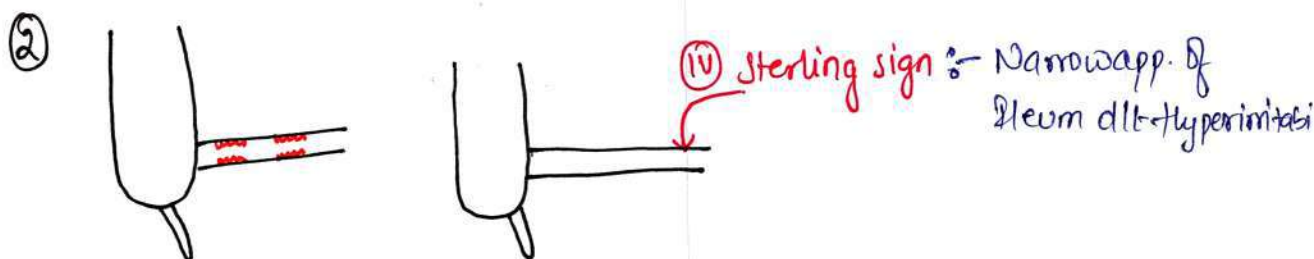
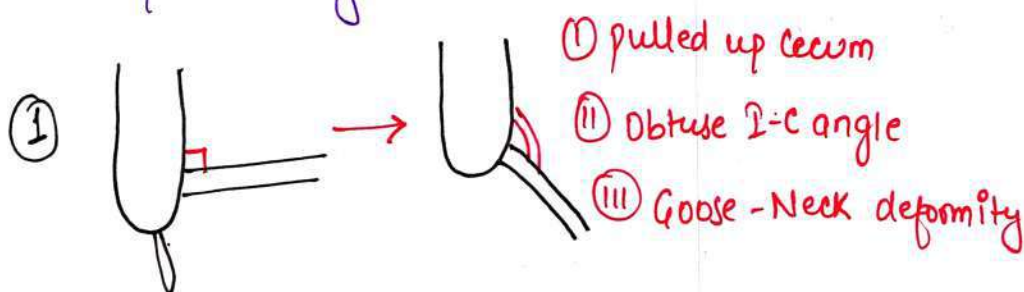
(v) ADA

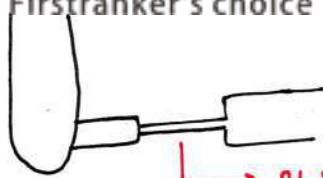
(adenosine deaminase)

* Doc for Asis GI TB:- CECT

* Lab fx raised in $> 90\%$ pt:- ESR.

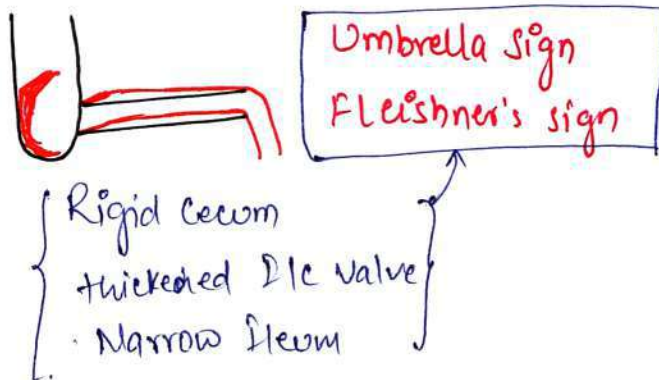
* On Ba. Meal followthrough:-





String sign of Kantor (Persistent stricture of ileum)

* Sterling sign & String sign of Kantor also seen in Crohn's Dis



Rx: ATT.

- Indicaⁿ of Sx:-
- (i) Acute Obstrucⁿ
 - (ii) Perforaⁿ
 - (iii) Bleeding
 - (iv) fistula formaⁿ
 - (v) Abscess.

SMALL BOWEL TUMOR

- *) MC Small Bowel Tu^m:- Stromal Tu^m > Adenoma
- *) MC Small Bowel Tu^m in children:- Lymphoma
- *) MC Malignant SBTu^m:- Adenocarcinoma > Carcinoid Tu^m.

- 1) NeuroEndocrine Tu.
- 2) Arise from EC cell
 - ↳ Enterochromaffin like cell
 - ↳ Crypt of Lieberkuhn
 - ↳ Secrete:- 5HT (Serotonin)

3) MC site of Carcinoid Tu.

B > I > R > A > C > S

i) Bronchus.

ii) Ileum

iii) Rectum

iv) Appendix

v) Colon

vi) Stomach.

* Small Intestine > Bronchus.

* Combined incidence of duodenum + Jejunum + ileum Carcinoid is more than Bronchus.

* MC Carcinoid in GIT:- Ileum.

* Hindgut :- Rectum
foregut :- Stomach

* Localized Carcinoid:- L > O > R

Larynx > Ovary appendix > Rectum
↳ Best Prognosis

* Overall Best prognosis is seen in laryngeal Carcinoid.

* In GIT Best prognosis " " " Appendiceal Carcinoid.

pancreatic > colonic > SI

* Pancreatic Carcinoid is having worst prognosis.

* In Carcinoid Heart D's :- Rt. sided (Mc involved)

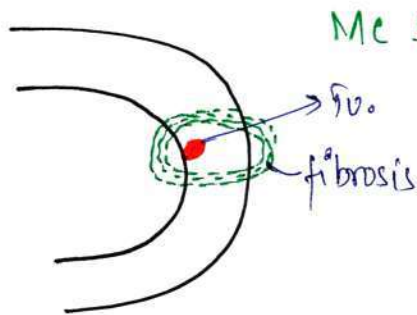
Valvular abnormality :- TR > PR > TS > PS

C/f :- Mc Manifestaⁿ :- flushing

Other :- wheezing

Bronchospasm

Diarrhea.



Mc symptom :- Abdominal pain

↳ cause :- obstructⁿ all + intense desmoplastic Reacⁿ & IT excessive fibrosis around the T.V.

* Ex :- ↑ level of 5 Hydroxy Indole Acetic acid in Urine. (5HIAA)

* Loc for localizaⁿ :- Somatostatin Receptor Scintigraphy (SRS)

* Chromogranin A ↑ in all NETs.

↳ if ↑ level → indicate poor prognosis.

Rx :- Resectⁿ & Anastomosis + 5cm Margin

D - Dacarbazine

E :- Epirubicin

F - 5-FU

* Carcinoid T.V. are having ^{relatively} Better prognosis as compare to AdenoCa.

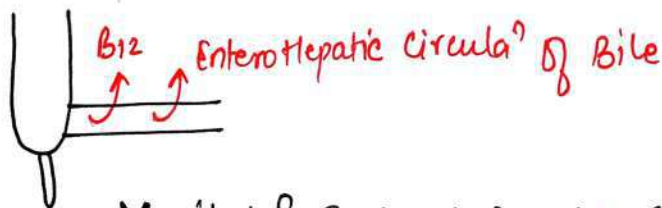
Q → Small Bowel Length < 200 cm K/A Short Bowel synd.

↓
cause massive Resecⁿ of Small Bowel. eg,

- (i) Crohn's
- (ii) Mesenteric ischaemia
- (iii) Mid gut Volvulus
- (iv) Mesenteric Trauma,

Q → Ileum is having better adaptability than jejunum

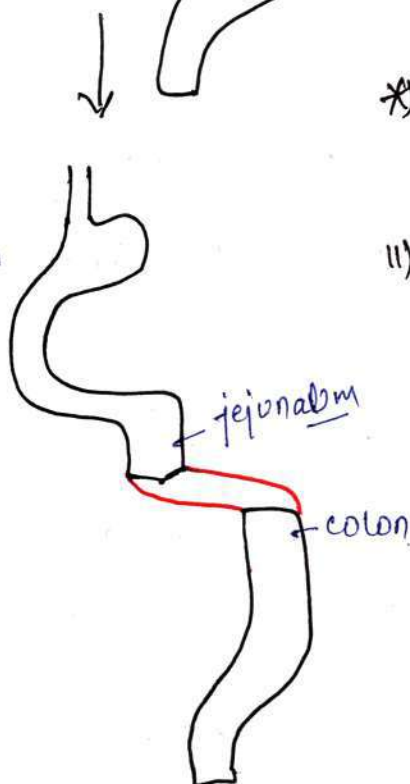
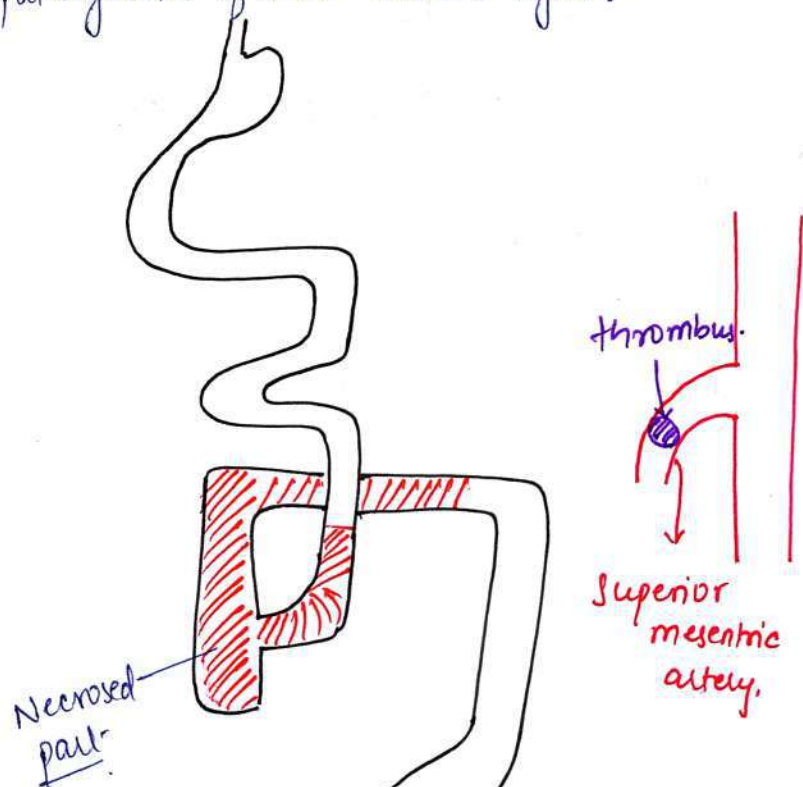
Q:- Jejunal Resecⁿ are better tolerated



Manifestaⁿ of Small Bowel synd.:-

- (i) Megaloblastic Anaemia d/t impaired absorpⁿ of Vit. B₁₂
- (ii) cholesterol gall stone d/t impaired Enterohepatic Circulaⁿ of Bile Salt.
- (iii) Malabsorpⁿ ↓
- (iv) free fatty acid combine w/ Calcium leading to absorpⁿ of free Oxalate from colon leading to formaⁿ of Oxalate stone.
- (v) Coli keti^c diarrhea :- d/t Bile salt induced watery diarrhea from colon.
- (vi) When I/C valve is removed
↓
Bacterial Over growth
↓
diarrhea occur.

* pathogenesis of short Bowel Synd:-



* Mx in post-operative period:-

DTPN.

ii) R/O:- Small Bowel Transplant?

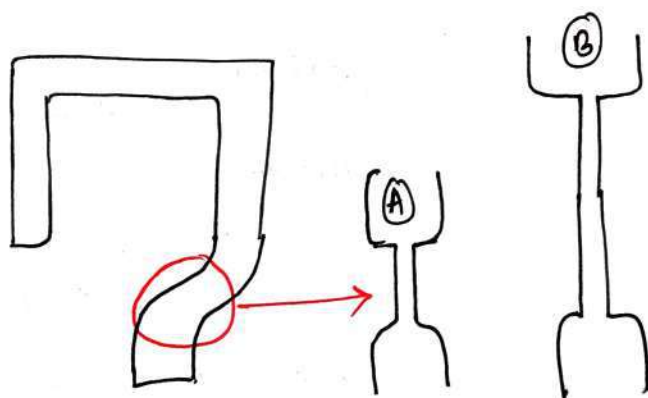
* Intestinal Lengthening procedure:-

① BIANCHI:- LILT (Longitudinal intestinal lengthening & tailoring)

② STEP:- Serial Transverse Enteroplasty procedure.

HIRSCHSPRUNG'S D'S :-

- 1:5000 live Birth
- It's Neurocristopathy :- failure of Migration of Neural Crest cell to Colonic Mucosa
- Mc Site :- Rectum > Sigmoid
- pathogenesis :- Absence of Ganglion cell in the Auerbach and Meissner plexuses.



* Affected segment is contracted

* Presentaⁿ depend on length involved and severity of contracteⁿ

3 Presentaⁿ :-

New Born

- Mc symptom :- Abdominal distention
- No passage of Meconium in 24hr

1st few week of life

- Abdominal distention (off & on)
- Constipaⁿ
- failure to thrive (fail to gain wt)

children and Young adult-

- Constipaⁿ (off & on)

Rectal Bx

* IOC :- Suction Bx > full thickness Bx
↓
∴ low Morbidity.

Definitive opera:-

- ① Swenson
- ② Duhamel
- ③ Soave

COLORRECTAL POLYPS :-

Neoplastic
(Adenomatous)

- ① Tubular (MC)
- ② Villous (Most Malignant)
- ③ Tubulo-villous.

Non-Neoplastic

- i) Hyperplastic (overall MC) (adenomatous polyp)
- ii) Hamartomatous.
 - juvenile polyp
 - Peutz-Jegher polyp.
- iii) Inflammatory Polyp.
 - Inflammatory Bowel Dis.:-
 - Pseudopolyp
 - UC & CD.

*) Out of juvenile polyp & juvenile polyposis least risk of malignancy is seen in juvenile polyp.

Juvenile Polyp:- Seen in children < 15yr of age

- *) MC site:- Rectum.
- *) Usually solitary polyp is +ve
- c/f *) Bleeding PR
- Rx. *) Polypectomy.

*) MC site :- P-J-J

→ Small intestine → jejunum

*) characterized by :- Hypermelanotic macule over Lip & Buccal Mucosa

*) LKB-1 / STK-11

*) Ch-19.

Pathology



→ ARBORIZATION

*) Pseudo-Invasion

*) Doesn't ↑ risk of Colorectal Ca.

*) ↑ risk of :-

i) Small Bowel Malignancy

ii) Breast Ca.

iii) Thyroid Ca.

iv) Pancreas Ca. :- Highest Risk

v) Sertoli Cell Tu. of Testis.

vi) Endometrial Ca.

FAP :-

*) AD

*) familial adenomatous polyposis

*) APC gene mutaⁿ (Adenomatous polyposis coli gene)

*) 5q,21

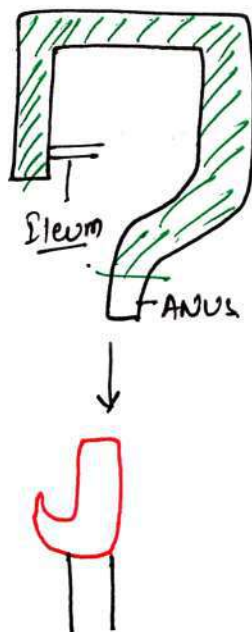
*) Adenomatous polyp

*) >100 polyps

*) >100% malignancy.

*) 15Yr of age polyp formaⁿ begin

*) 100% pt. develop malignancy by 40Yr of age



Same Rx is done in

- 1) FAP
- 2) UC



* MC complication :- Small Bowel Obstruction (25%)
 of FAP after
 Total proctocolectomy
 (+)
 IPAA
 → no pouchitis in FAP b.c FAP is not inflammatory.
 D's.

* in UC :- Pouchitis. (33%) + Small Bowel Obstruction (25%)

* LOC for Screening in FAP for family memb:- APC gene testing.

* MCC of FAP after Total proctocolectomy (+) IPAA :- Perianal Ca.

→ GARDNER'S SYND:-

- 1) AD
- 2) Osteoma (MC in Mandible)
- 3) CHRPE (Cong. Hypertrophied Retinal Pig. Epithelium)
- 4) Desmoid Tuo.
- 5) Benign lymphoid polypoid of ileum
- 6) Supernumerary teeth

(Multiple teeth) ←

* TURCOT'S SYND

- AR.

- Brain T_U. :-

in FAP :- Medulloblastoma (Best)
(FM) Glioblastoma. :- HNPCC
Mn (FH)

* HNPCC :-

- AD

- Mismatch Repair Gene abnormality

- Ch- 2, 3, 7

- Gene - 7

- 90% :- 2 Gene responsible :-

1) hMLH-1

2) hMSH-2

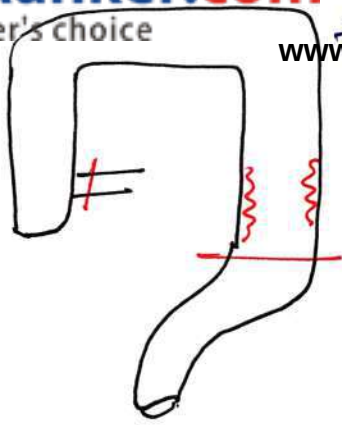
* FAP is responsible for 1% of ColoRectal Ca. having 100% Risk of Malignancy
* HNPCC is responsible for 5% of ColoRectal Ca. having upto 80% Risk of Malignancy that's why prophylactic Rx not Recommended.

* LYNCH Synd. $\left\{ \begin{array}{l} \text{LYNCH-1} \div \text{One type of T} \div \text{Colo Rectal Ca. (CRC)} \\ \text{LYNCH-2} \div \text{2 type of T} \div \text{CRC + Extra Intestinal Malignancy} \end{array} \right.$
Endometrial > Gastric > Ovarian

* Modified Amsterdam Criteria for Axis of HNPCC (EGO)

* Modified BETHESDA " used to detect Microsatellite instability.

* MUIR-POREE Synd :- Variant of HNPCC having multiple Sebaceous cysts, Adenoma & Adeno Carcinoma.



* After development of colon CA.

Total Colectomy + Ileorectal Anastomosis.

* To Rule out Malignancy in Rectum
↓ do

Annual Proctoscopy

* female + complete family :- TAH + BSO.

(TAH) :- Total abd. hysterectomy

COLORECTAL CA :-

Rif :-

- ① Alcohol
- ② Smoking
- ③ High fat diet.
- ④ FAP
- ⑤ HNPCC
- ⑥ Inflammatory Bowel D's (UC & CD)

⑦ Adenomatous Polyp

⑧ Uretero sigmoidostomy

IX Streptococcus Bovis Bacteremia

X) Acromegaly

XI) Pelvic Irradiaⁿ

↑ risk
MN
USA

Ca. Colon

*) MC site :-

a) Rectum

b) Sigmoid. ✓

(Rectum is not a part of colon)

*) Least common site of Ca. Colon :- Hepatic flexor of colon.

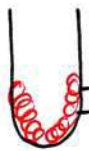
1) Chemo. Regimen:-

FOC-FOX-FV
↓
Folinic Acid (LEUCOVORIN)
↓
5-FU
↓
Oxaliplatin

also for Rectal Ca.

Clf: MC Symptom :- Abdominal pain.

Rt. Colon Malignancy



- fungating
- cauliflower
- Ulcers proliferative like growth.

- Bleeding is (MC)

↓
Anemia
↓
fatigue

- Hematochezia (Massive bleeding)
- Melena
- Rt. Iliac fossa Mass.

Lt. Colonic Malignancy



- Annular (or) Circumferential (or) Stenosing
- Narrow Caliber of Lt. Colon.
- Solid fecal Matter
- Obstrucⁿ is (MC)

* Ca. Transverse Colon :- Both Bleeding & Obstrucⁿ is Seen.

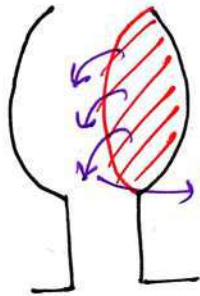
1) DOC for Dx :- Colonoscopy + Bx

2) Doc for Staging of Ca. Colon :- CECT

3) Rx:- Resecⁿ & Anastomosis w/ 5cm margin.

4) In which case Chemo given :- It given Routinely in pt. of stage 3 & 4.

- Seen in 5th-6th decade
- Mc site of Mets :- liver
- chemo. Regimen :- FOL-FOX-IV



* MC symptom :- Bleeding PR.

* Early morning diarrhea + In Early intense desire of defecation + ↑ Mucus discharge.

* ~~Intermittent~~ diarrhea Spontaneous

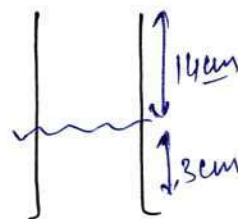
* Passage of Bloody Slime (Blood + Mucus in every 2-3hrs)

TENESMUS :- painful defecation + sensation of incomplete evacuation.

Seen in Ca. Rectal Ampulla.

Loc :- Sigmoidoscopy + Bx

- Proctoscopy + Bx
- Sigmoidoscopy + Bx ✓
- Colonoscopy + Bx



Length of Anus - 3cm
" " Rectum - 14cm

(N) Length :-

Proctoscope :- 10cm

Rigid Sigmoidoscope :- 25cm

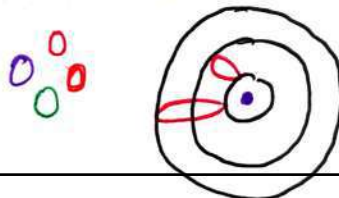
flexible " :- 60cm

Colonoscopy :- 160cm

* for Adequate Evaluation of Colon & to Rule out Synchronous Polyps (or) Malignancy Colonoscopy is mandatory

(Metachronous :- बाद में)

* Loc for Tumor 'T' Staging :- TRUS (Transrectal USG) of Ca. Rectum

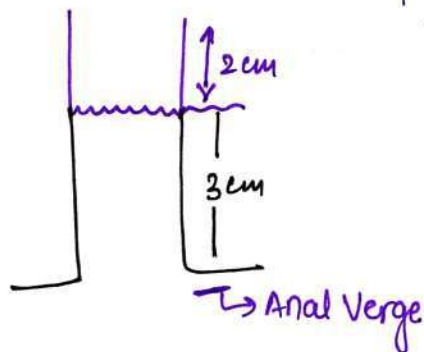


Do for lymph node staging - F-6a MBS (Endo Rectal 2011 MBS)
 and overall and Over all
 Staging

* R₂ :-

1) Stage I :- Surgical Resecⁿ

II, III, IV :- Neoadjuvant chemo Radiaⁿ + b surgery @ Palliation.



Q Q 1) Malignancy located > 5cm above Anal Verge - R₂OC LAR (Low Anterior Resecⁿ)

Q Q 2) Malignancy @ or below 5cm ~~below~~ from Anal Verge :- Abdomino Perineal Resecⁿ (APR)

Ca. Anal Canal.

1) Histological :- Sq. cell Ca > Basal cell Ca > Malignant Melanoma type

2) R₁ f :- 1) Smoking

2) HPV infecⁿ (16, 18, 31, 33)

3) Multiple partner.

4) HIV/ Immuno compromised.

5) Anal Receptive Intercourse.

3) Presentaⁿ :-



- Bleeding PR (MC symptom)

- foul smelling discharge.

- MC site of Mets :- LUNG.

- MC group of LN involved :- Inguinal LN

Doc :- Procto scopy + Bx

R₂OC: APR + Bx MEN (chemo Radiaⁿ)

Chemo + Radio
Capitane + Mito Myline flb Radio?

(SFU)

↳ It is v. good Radio Sensitizing agent.

Radio - Chemo
not done

* Ca. Esophagus (especially oropharynx) :- Roc ChemoRadio?

* for non-Responding case to chemo-Radio? → APR done.

Rectal Prolapse in children.

- Mucosal prolapse.

Cause:- ① Malnutriⁿ (Protein Energy malnutriⁿ)

② Worm intestaⁿ

③ Diarrhea

④ Meningomyelocele

⑤ Sacral Agenesis.

→ do THIERSH ANAL WIRING.

- Most of the pt. Respond to conservative Mx in :-

i) Malnutriⁿ

ii) Worm intestaⁿ

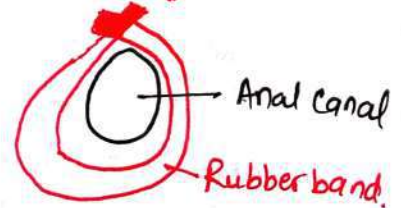
iii) Diarrhea



for non-Responding pt.



LOKHART-MUMMARY RECTOPEXY



Rectal Prolapse in Adult:-

- full thickness prolapse

- 2 type of Repair:-

i) Abdominal

ii) Perineal

- 1) a/w + Recurrence rate
- 2) High Morbidity
- 3) It is preferred in Young pt

Sx: WAR

W: Well's Abdominal Ripstein

1) High Recurrence

2) Low Morbidity

3) It is preferred in Elder

Sx: PAD

Perineal Altmier's Delorme

"Thiersch"

ANO-RECTAL ABSCESS



Theory: cryptoglandular theory is responsible for formaⁿ of Ano-Rectal Abscess

→ In this Pus follow the Least Resistance path.

Type:-

- (I) Perianal (Mc)
- (II) Ischio Rectal (2nd Mc)
- (III) Submucous
- (IV) Pelvi Rectal

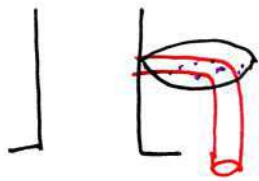
Clt: pain in Perineal Region also fever

Rxc: 1 & D + Antibiotic

→ cruciate shaped incision

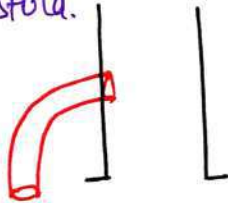


- cryptoglandular theory is responsible.

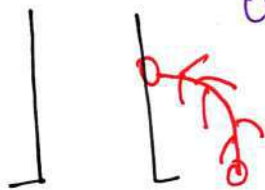


* Simple fistula.

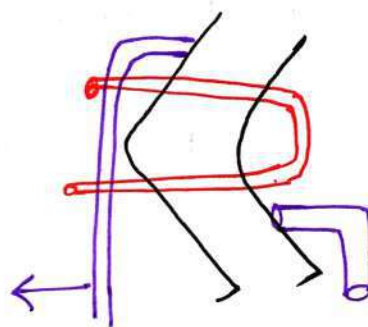
↓
single
fistula



* Complex fistula :- Multiple Branch Tract.



→ Component of Ano Rectal Ring :-



① Puborectalis

② Internal anal sphincter

③ External anal sphincter

low line fistula.

* High line fistula :- internal opening located above Ano-Rectal Ring

* Low line fistula :- Internal opening is located below Ano-Rectal Ring

* Park's classificaⁿ :-

Type ① Inter Sphincteric (MC)

② Trans "

③ Supra "

④ Extra "

Mn :-

"ITS Extra"
1 2 3 4 Type

It is 1) External opening in peri-anal Region & two-three month.

Periodic Serous discharge every

(ii) Infection can lead to Abscess.

Ix :- 1st Ix :- fistulo Gram.

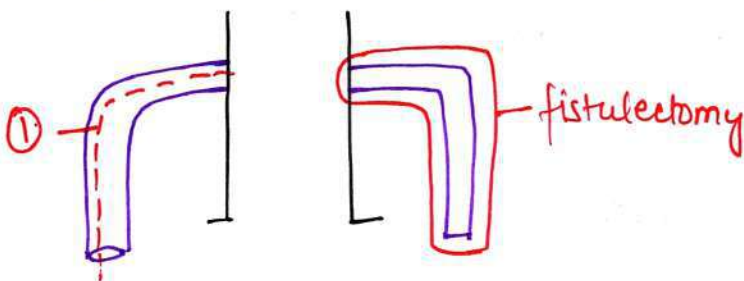
Ixc :- MRI

Rx :- (i) FISTULOTOMY

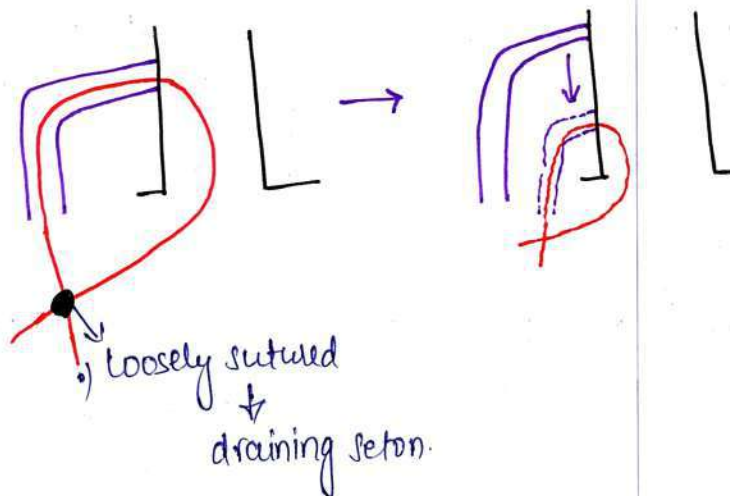
(ii) FISTULECTOMY

(iii) SETON $\left\{ \begin{array}{l} \text{Cutting} \\ \text{Draining / Non-cutting} \rightarrow \text{for infected fistula.} \end{array} \right.$

(iv) VAAFT :- ~~Vide~~ Video Assisted Anal fistula Treatment.



* Usually for fistula Setons (KSHARSUTRA) $\rightarrow$ Thread

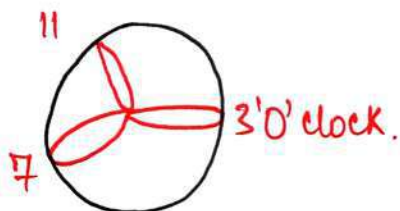


Q :- Draining Seton is mainly used for HIV +ve pt & Crohn's d's pt. having multiple infected fistula.

HEMORRHOIDS

- 1) (N) anatomical cushion composed of Venules, Arterioles, Smooth m's fibers and Elastic tissue (Mn: VASE)

Type :-



- 2) In pt. of constipaⁿ Excessive straining

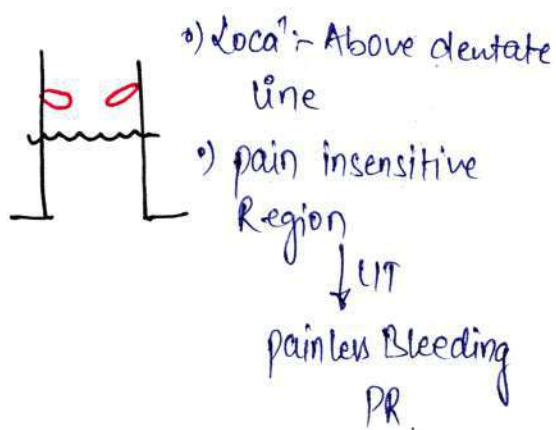
↓ CIT

abnormal descend in the lower part of Rectum. & is injured by Hard fecal Matter

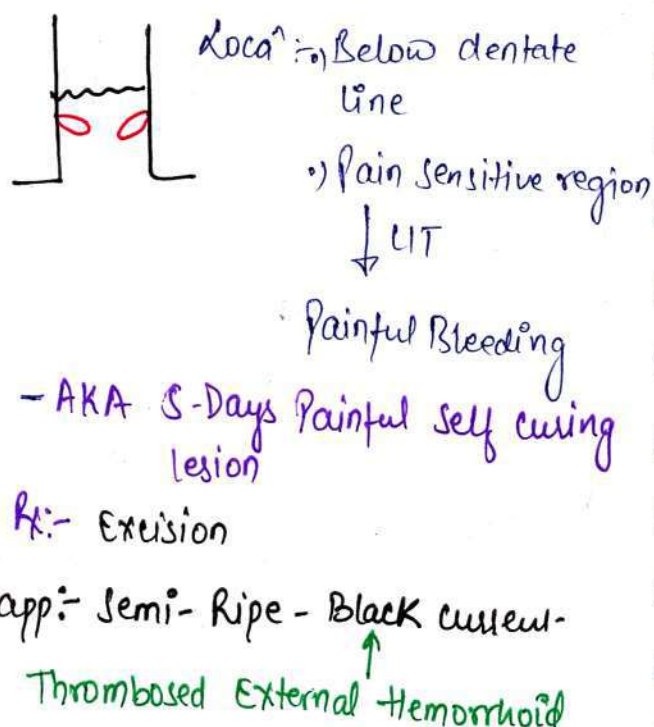
↓ CIT

painless Bleeding PR.

Internal Hemorrhoid



External Hemorrhoid



Mcc of Significant lower GI Bleed :- Colonic diverticula

Mcc of Occult (Hidden) lower " " :- Angiodysplasia aka Vascular Ectasia

A) Hemorrhoid can not be palpated.

* Hemorrhoid Aged on Proctoscopy

* Classification:-

1° :- Bleeding Only

2° :- Bleeding + Prolapse during defecation & Spontaneous Reduction

3° :- Bleeding + Prolapse & Manual Reposition

4° :- Bleeding + Permanent Prolapse.

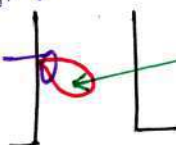
Rx:- 1° :- Dietary modification + Stool Softeners.

*) 1°, 2°, Selected pt. of 3° :- ① Banding :- Safe, cheap and Effective Technique

↳ non Responding to previous Rx.

② Sclerotherapy

Banding



5% phenol in Almond oil

*) for selected pt. 3° & 4° pt. :- Hemorrhoidectomy.

① Milligan Morgan open Hemorrhoidectomy

Not done

[X (ii) Ferguson closed Hemorrhoidectomy.

X (iii) Whitefield Submucosal

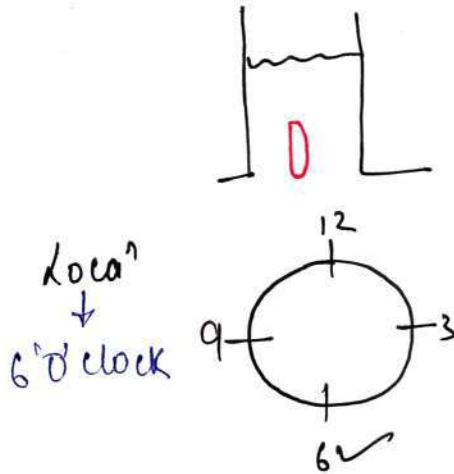
(iv) Longo's Stapler

:- preferred :- also lesser post-operative pain.

* MC complication after Hemorrhoidectomy
pain > Urinary Retention

FISSURE - IN - ANO

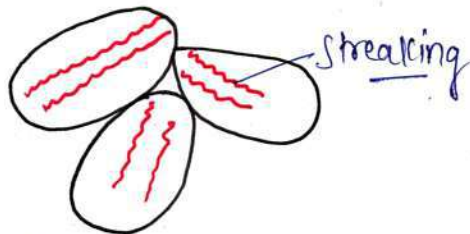
cl^{fe}:- Longitudinal split in the posterior wall of Anoderm (Mucosa lining Anal canal) in Midline



* 2 types:-
① Acute

② Chronic fissure:-
TRIAD:-
① canoe shaped ulcer (small boat)
② Hypertrophied papillae
③ Sentile Pile

C/O * 1) Spasm in Internal Anal sphincter
2) Constipaⁿ



pathophysiology same as
C. Achalasia

Clt:- Painful defecⁿ. + streaking of Blood over fecal Matter
*) DRE is CIL.

① 2% Dilazem Gel (CCB) } Local applicⁿ
0.2% Nitroglycerine

② BOTOX injectⁿ

③ KORD'S PROCEDURE :- Manual Dilatⁿ

↓
Absolute contr^a :- ↑ Risk of incontinence

④ NOTARA'S LATERAL SPHINCTEROTOMY (TOL)

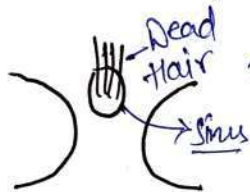
PILOPIDAL SINUS

① Acquired

① Hairy Male

① 20-29 Yr Age

① MCH Jeep drivers of army KIA "JEEPS Ws"



① It's characterized by collecⁿ of Dead Hair in post-Natal cleft Region.

other locaⁿ :-
① Barbers :- finger cleft
① Umbilicus
① Anilla

clt :- ① Dyscomfort & Serous Discharge & formaⁿ of Hair Ball

① Infeⁿ can dIT abscess formaⁿ → Rx I & D + Antibiotic

① Only Pilonidal Sinus :- Rx ① Excision of Sinus + closure of defect the flap

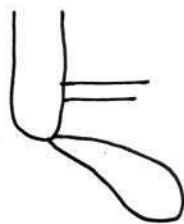


① LIMBERG'S flap

① Karydaki's flap

② BASCOM Procedure is done in Pilonidal Sinus.

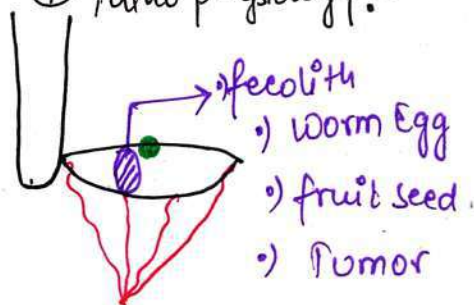
- *) Length :- 2-20 cm
- *) Content :- 0.1 ml
- *) MC locaⁿ :- Retrocecal.
- *) Least locaⁿ :- Post-Ileal.
- *) Most dangerous locaⁿ :- Pelvic
- *) Blood supply :- Appendicular branch of Ileocolic artery



ACUTE APPENDICITIS

- MC General Surgical Emergency worldwide
- Young pt. - 2nd decade

*) Patho physiology :-



Luminal obstructⁿ



Impaired Lymphatic drainage



Impaired Venous supply



Impaired arterial supply



Ischemia & perforaⁿ

*) Mesite of perforaⁿ :- just distal to obstructⁿ @ anti mesenteric border

*) MC Organism :- Bacteroid fragilis > E. coli

C/f: (i) Pain in Peri umbilical Region $\rightarrow$ Shift to Rt. Iliac fossa in 4-6 hr.
(Most specific symptom - Migratory pain)

(ii) Anorexia (iv) Vomiting

(iii) Nausea (v) fever (low grade)

Tenderness

Rebound Tenderness

* Sign:- Murphy Sign:- pain on coughing.

Ten-Horn Sign:- Pain on Gentle ^{Traction} of R testis.

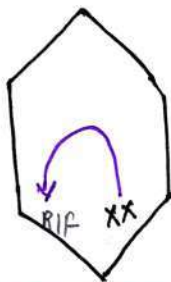
PSOA Sign:- Hyperextension of Rt. Hip joint. $\swarrow$ IT Pain in Retrocecal appendicitis.

Obturator Sign:- Medial Rotⁿ of Rt. thigh over hip joint. $\swarrow$ IT pain in Pelvic appendicitis.

Microhematuria >3 RBC /HPF

Pelvic Appendicitis :- Abd. sign & symptom are not mark

- Tenderness is elicited by digital examⁿ
- also Diarrhea and Microscopic Hematuria
- $\uparrow$ Risk of perforaⁿ



ROUSING'S SIGN:-

- Pain in RIF on pressing LIF.
- Most characteristic Sign.

ROUSING'S synd. :- Abd. pain, N&V on Hyper Extension of spine in Horse shoe Kidney.

ROUSING'S operaⁿ :- Deroofing of cyst in ADPKD

Diis of Ac. Appendicitis:- is purely clinical supplemented by :-

(I) PLG

(II) USG.

* Loc in ac. appendicitis in children :- USG

* R^{oe} :- Emergency Appendectomy.

- M - Migratory pain
 A - Anorexia
 N - Nausea and Vomiting
 T :- Tenderness
 R :- Rebound tenderness
 E :- Elevated Temp
 L :- Leucocytosis
 S :- Shift to left

Mn LT-2

& T is score of 2

Score :- 9-10 :- Certain

7-8 :- High likelihood of Diagnosis

5-6 :- Equivocal (पता नही)

1-4 :- Negative

Indica for ECT

* ↑ risk of appendicular Perfora?

Fecolith DIE IN PELVIC Sx

- ① fecolith obstruct
- ② DM
- ③ Immunocompromised state
- ④ Extreme of Age (<5 or >65yr)
- ⑤ Pelvic appendicitis
- ⑥ H/o previous Sx

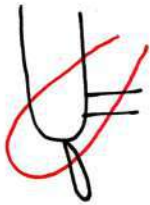
- Conservative Mx of Appendicular Lump.

Component :- ① Appendix

② Ileum

③ Cecum

④ Omentum



- Confirm the Dx :- CECT & start IV antibiotic

• Vital Monitoring hourly :-

① Pulse

② Temp

③ Symptoms.



Most pt. improve

↓ Then do.

① Interval appendectomy :- indication when pain occurs again KIA Recurrent appendicitis.

✓ ② No appendectomy

* During Conservative Mx not improve → Do Sp :-

• Indicaⁿ of Sp :-

P :- Pulse Rate ↑

S :- ~~Spreading~~ Spreading Abdominal pain

M :- Mass size ↑

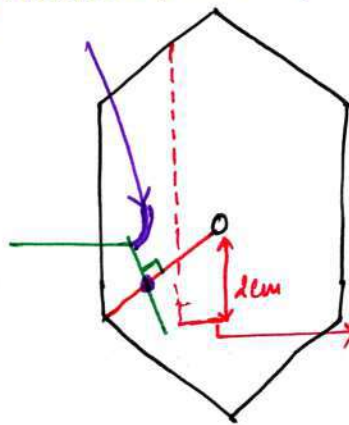
} indicate perfora?



Exploratory laparotomy

⊗ M's cutting incision → Rutherford Morrison

* Incision:-
McBurney's
McArthur
Grid-Iron
→ M's splitting



* Line joining mid point of clavicle & mid point of inguinal lig.
Transverse incision given 2cm below umbilicus ⇒ **LANZ INCISION**
(Cosmetically better)

* McBurney's point correspond to Base of appendix.

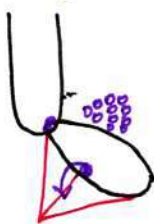
* MC Tumor of Appendix:- Carcinoid Tumor (Argentaffinoma)
∵ arise from Argentaffin Cell

CARCINOID TUMOR OF APPENDIX

- Small, localized, usually located @ tip.
- Not q/w Carcinoid Synd. @ Metastasis.

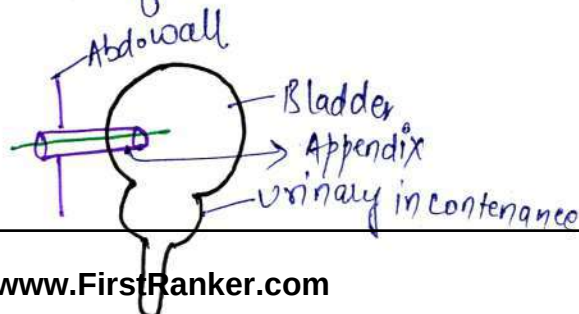
Rx:-
Up to 1cm :- Appendectomy.
> 2cm :- (R) Hemicolectomy.
> 1-2cm :- Appendectomy.

- Indicaⁿ of Rt. Hemicolectomy. when size > 1cm - 2cm :-



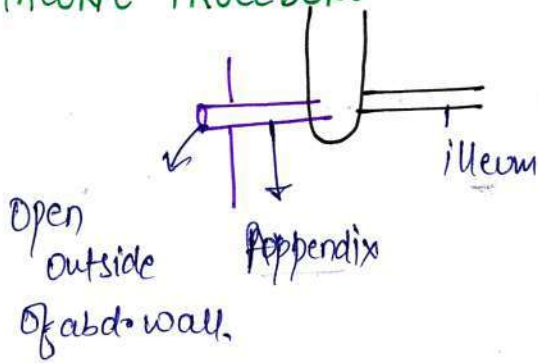
- (I) Invasion of Mesappendix
- (II) Invasion of Cecal Base
- (III) Involvement of LN.

Q - Appendico-Vesicostomy :-
↓
MITROFANOFF'S procedure



Appendicectomy

MAJONE PROCEDURE

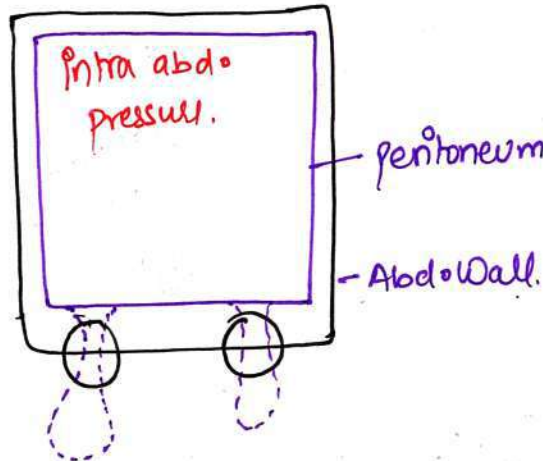


Rx:- PSARP (Posterior Sagittal Anorectoplasty)

D-4

HERNIA

defⁿ: protrusion of viscus or part of viscus through the wall of its containing cavity.



Rlf :- ① Weakness of abdominal wall.

② ① patient- processus vaginalis

② patient Canal of Nuck

③ Connective tissue disorder:-

Ehler's danlos synd

congenital :- prone Belly Synd.

④ Ectopia Vesical.

⑤ defective collagen synthesis

② factor ↑ intra abd. pressure :-

1) Ch. cough.

2) Constipa?

3) COPD (Bronchitis

4) Obstructive Uropathy

5) Ascitis

6) Pseudomyoma Peritonie

7) Preg.

8) Intra abd. Mass/Tu.

9) Heavy wto lifting.

⑦ Advancing age

⑧ Steroid intake

⑨ Smoking

⑩ Lower abd incision

Q:- femoral Hernia is MC in ♀

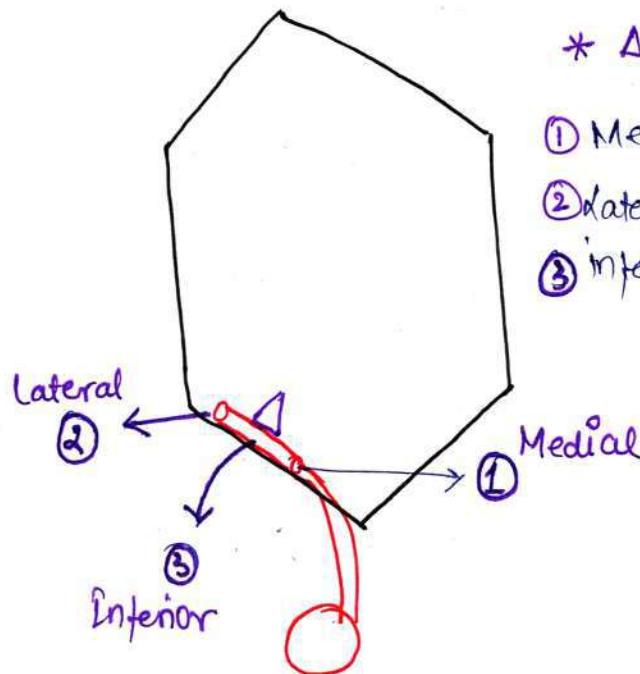
Q:- "Neck" of sac is located above and Medial to pubic tubercle in Inguinal Hernia and "Neck" of sac is located below and lateral to pubic tubercle in femoral Hernia.

Q:- Deep Ring is the defect in fascia transversalis

Q:- Superficial Ring is the defect in External Oblique Aponeurosis

Q:- Indirect Inguinal Hernia comes indirectly from deep Ring → traverses inguinal Canal → comes out via superficial Ring

Q:- Direct Inguinal Hernia → comes out directly from posterior Abdominal wall via Δ of HESSELBACH



* Δ OF HESSELBACH :-

- ① Medial:- Rectus Abdominis
- ② lateral:- Inferior Epigastric A.
- ③ inferior:- inguinal lig.

⊗ Relaⁿ of Sac in Inguinal Hernia:-

- ① Indirect Inguinal Hernia :- Anterolateral to the cord
- ② Direct " " :- posterior to cord

① Sac Reaching Inguinal Canal:- **Bubonocoele**

② " " upto Epididymis:- **funicular**

③ " " " Base of Testis:- **Complete or Scrotal Hernia**

* **Asis of Hernia is purely clinical.**

* **Content:-**

① **Enterocoele** :-> Content is Small Intestine.

↓

• 1st part difficult to Reduce

• Last part Easy to Reduce
and

• Reduces with grunting sound

② **Omentocoele** :- Content is Omentum

↓

• 1st part :- Easy to Reduce

• Last part :- difficult to Reduce

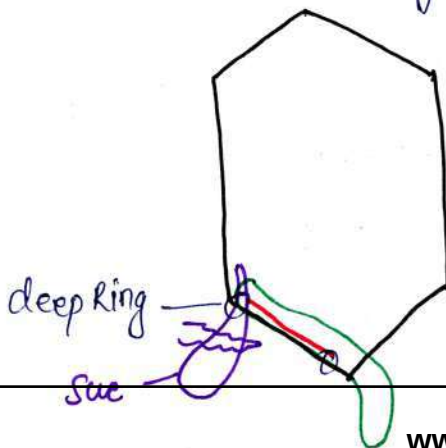
• Content :- Doughy

Q:- In case of spigelian Hernia Asis is confirmed by:- **USG / CT**

* **Rx of Hernia:-** Steps:- ① **Rx of Hemial Sac**

② **Inguinal floor Reconstruct?**

HERNIOTOMY



1) Inguinal skin-crease incision

2) Division of subcutaneous fat, Camper's fascia and Scarpa's fascia

3) Incision over External Oblique Aponeurosis along the direcⁿ of fibres.

4) Hook the Cord → Isolate the Sac →

www.FirstRanker.com

open the Sac @ fundus → Reduce the Content Back into peritoneal cavity

6) Excise the Reductent Sac.

Hernioraphy :- Herniotomy + Inguinal floor strengthening $\bar{c}$ the help of Suture

Hernioplasty :- Herniotomy + Inguinal floor strengthening $\bar{c}$ the Help of Mesh.

*** Types of Hernia Repair:-**

① 1^o tissue Repair

- aka Tension Repair

- Type:- ① Bassini's

② Shouldice

→ Bassini's :- aka (Triple layer Repair)

→ Internal Oblique + Transverse Abdominis + fascia Transversalis

→ Suture $\bar{c}$ shelving Edge of Inguinal lig

- a/w Tension over the tissue

- ↑ Risk of Occurrence

→ Shouldice Repair :- Double Breasting of fascia Transversalis aka FOUR layer Repaired

• Modified Shouldice :- Double Breasting of IO + TA + FT aka SIX LAYER REPAIRED.

• Shouldice is lesser tension (as compared to Bassini's)

• Low Recurrence Rate (as compared to Bassini's)

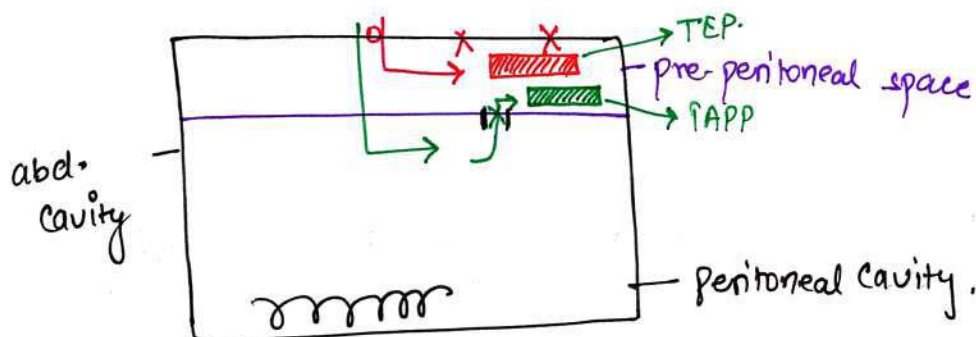
- ~~Lichten~~ Lichtensten Repair

- Steps:-
- ① Mesh is fixed / suture to anterior Rectus Sheath.
 - ② Inferior aspect of Mesh is sutured to Inguinal lig.
 - ③ Artificial deep Ring is created by overlapping the cut Edges of the Mesh.
 - ④ Superior Aspect of Mesh can be sutured to conjoint Tendon.

③ Laproscopic Hernia Repair:-

① TEP:- Totally Extraperitoneal

② TAPP:- Trans abdominal Pre-peritoneal.



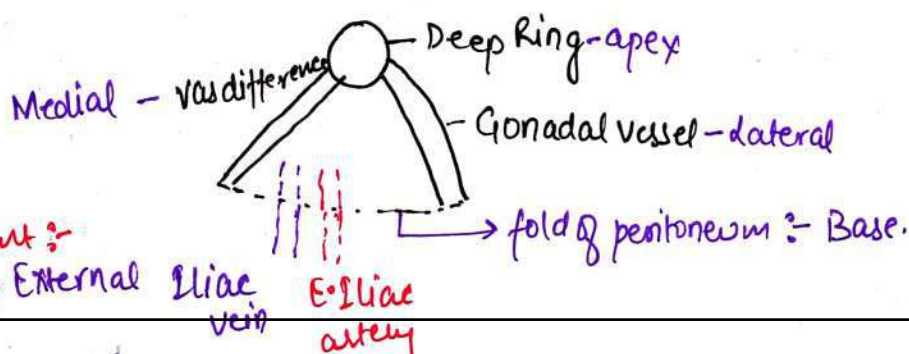
* TEP :- Small working space But low Risk of adhesion and Bowel injury.

* TAPP :- Huge working space High Risk of adhesion and Bowel injury.

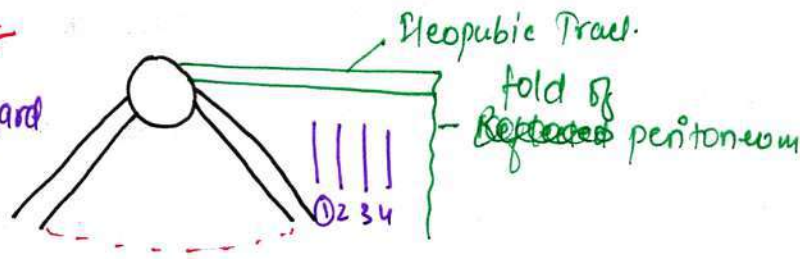
* TEP :- is preferred by Experienced sp

* TAPP :- n n n Beginners. (Non-Experienced sp)

TRIANGLE OF DOOM:-



* ^{Hernia} Triangle of pain:-
aka:- Electric Hazard zone



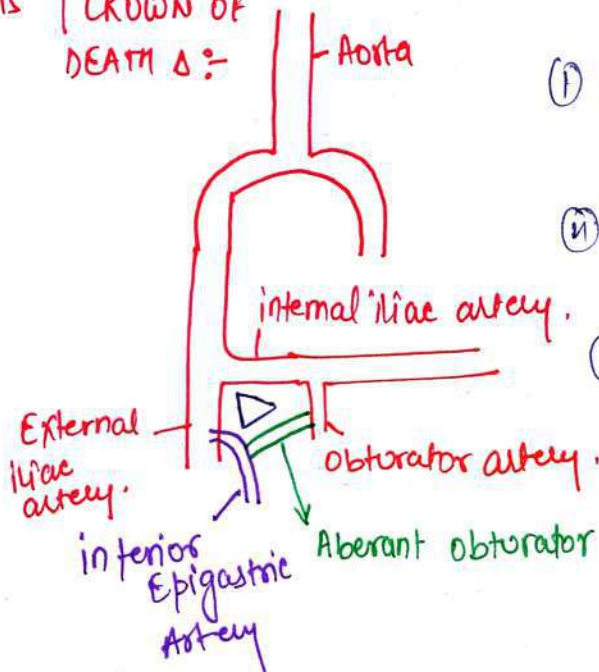
- Content:-
- ①:- femoral Nerve
 - ②:- femoral Branch of Genito femoral Nerve
 - ③:- Ant. Cutaneous Nerve of thigh
 - ④:- lat. Cutaneous Nerve of thigh

Boundary:-

- ① Medial:- Gonadal Vessel
- ② Superior:- Iliopubic tract.
- ③ Lat:- fold of peritoneum

- * Electro coag should not be used in this region to avoid injury of Nerve.
- * MC injured Nerve in laparoscopic Hernia Repair:- lat. Cutaneous Nerve of thigh.

* CORONA MORTIS | CROWN OF DEATH :-



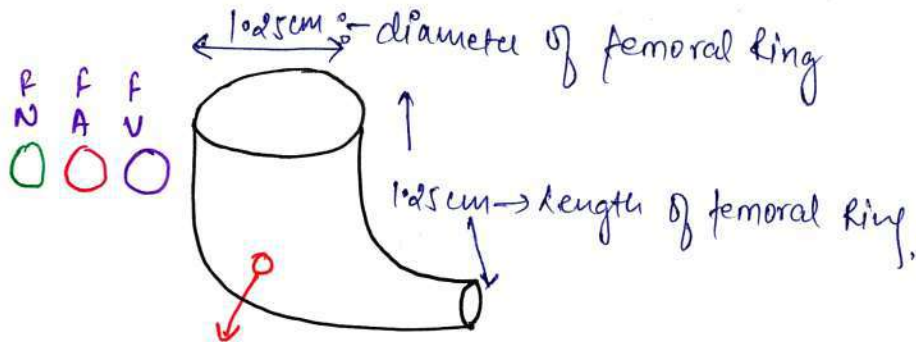
- ① Obturator artery is a branch of Internal iliac artery.
- ② Anterior Epigastric artery → External iliac artery.
- ③ Aberrant obturator artery arises from Anterior Epigastric artery attaches to obturator artery → forms a vascular loop arches over ligament of Cooper injured during Mesh repair

1) MC in ♀

2) MC in Multipara

3) MC on Rt. Side

4) B/L in 20% cases.

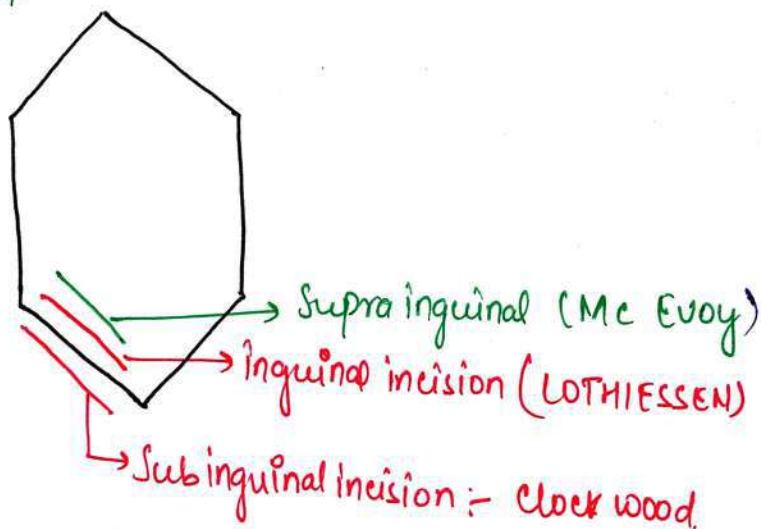


Cloquet LN. = Content of femoral ring

1) femoral canal is narrow & rigid also risk of strangulation

∴ Sx sh performed as early as possible after asis.

* Name of Sx



* R/O:- Henry's Procedure aka Trans Abdominal Midline Extra peritoneal Mesh Repair

Neer * Variant of femoral Hernia:-

① **DAUGIER'S** Hernia:- Hernia Through defect in **Acetabular** liga.

② Cloquet Hernia :- Sac in Relation to Pectineus fascia.

③ **Narath** Hernia :- seen in congenital distor of hip & sac is in Relⁿ to femoral vessels.

*) Longenital (20%)

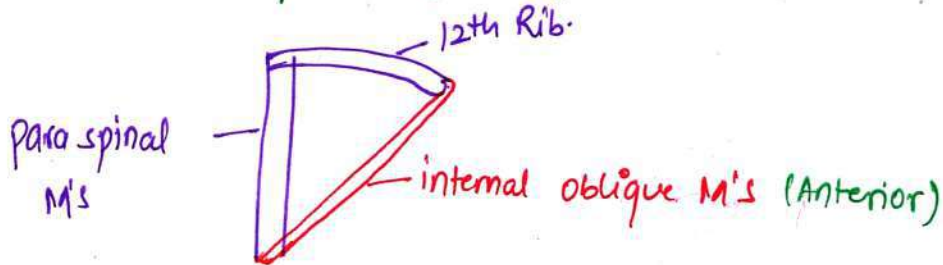
*) Acquired (80%)

- Mc Side :- (Rf)

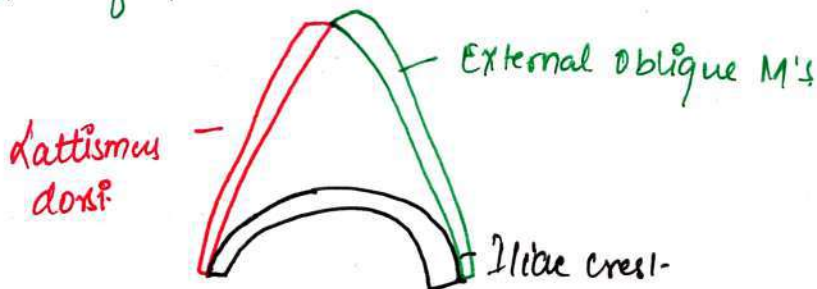
- Boondaries: - ① Superior Δ of Green field

*) Located in lumbar Region involving posterior abdominal wall.

* Most lumbar Hernia comes from Superior Δ of Green field.



② Inferior Δ of Defect



*J) presenter:- size of defect is very large

↓

∴ large Bulge in lat-abd. wall.

* Risk of strangula? is Vo Rare

*) Name of opera:- DOWD'S OPERA

*J) Obturator Hernia:-

- *) Skinny Old Lady Hernia
- *) French Hernia

*) Rf:- ① ch. Malnutriⁿ

② Multipara ∴ laxativity of lig

③ Elderly female

④ ch. Constipaⁿ ⑤ factor ↑ intra. abd. pressure.

*1) Hauschke Romberg Sign :-
(ROMBERG Sign)

Compression of obturator Nerve leading to pain
along Medial Aspect of thigh radiating to
Ipsilateral knee joint

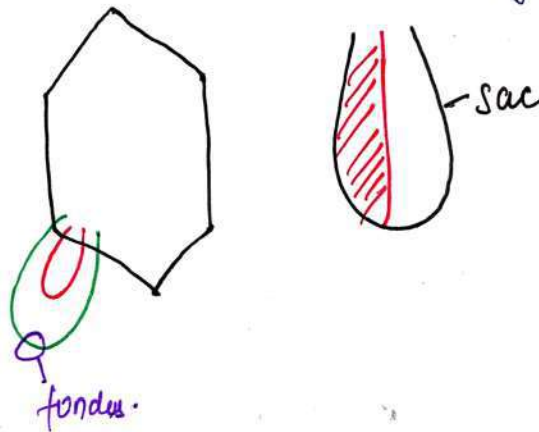
*2) Hannington Kiff sign :- Absence of Obturator Reflex (Withdrawal Reflex)
due to compression of Obturator Nerve

Rx :- Repair by
posterior approach.

* Sliding Hernia :-

Hernia-en-Glissade

Charac^o :-
featur^e :- posterior wall of sac is formed by viscera



Q :- MC in Males.

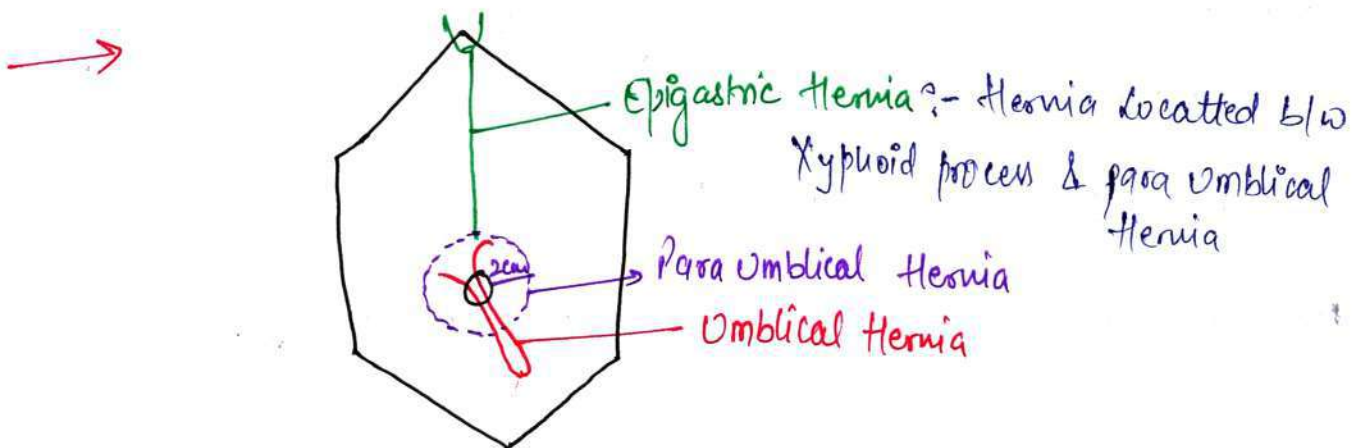
1) MC in (L) Side :- MC content :- Sigmoid

(R) Side :- MC content :- Cecum

2) ↑ Risk of Bowel injury during Repair

Rx :- Inversion of content along sac and Repair the defect.

- Seen in Infra Umbilical Region
- Most case located Below Arcuate Line
- Inter-parietal Hernia,
 - Content penetrate the Spigelian fascia & internal oblique M's
 - Located B/w Internal & External oblique
- Spigelian fascia is an aponeurosis located B/w Rectus abdominis Medially and Semilunar line laterally
- CH: ① Abd. pain.
 - ② Swelling is not palpable
- Dx: By USG/CT
- Rx: of Invasion of content & Repair of defect
 - Size of defect to indicate used of Mesh: $>4\text{cm}$:- Use Mesh.



aka Epigastric Lipoma

1) fatty Hernia of Linea alba

1) Characterized by: Hernia of ~~per~~^{pre} peritoneal fat via defect in Linea Alba.

Q 1) Epigastric Hernia is just off the Midline in 80% of case.

1) It is Multiple in 20% of cases.

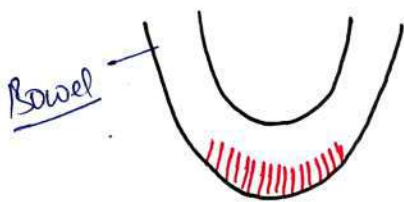
1) In Epigastric Hernia pain is referred to Epigastric Region & it mimics Peptic ulcer.

Ex: 1) Excise the pre-peritoneal fat & Repair the defect.

1) defect > 4cm: use Mesh.

* RICHTER'S HERNIA:-

- It is Hernia of part of circumference of Bowel.



1) It is mc also femoral Hernia

1) pt. + it = colicky pain and diarrhea → it mimics

acute gastroenteritis → AIT delay in dx

↓ AIT

Risk of strangulation

* Meckle's diverticulum content in Hernia:- Litter's Hernia

* Appendix

" " Hernia:- Amyand's "

* GIBBON'S Hernia:- Hernia + Hydrocele.

* BERGER'S " :- Hernia in Pouch of Douglas.

Ogilvie's Hernia :- Hernia through defect in Conjoint tendon.

Peterson Hernia :- Hernia Behind Roux-Limb after Roux-EN-Y Gastric Bypass

MC Bariatric Sx - Roux-EN-Y.

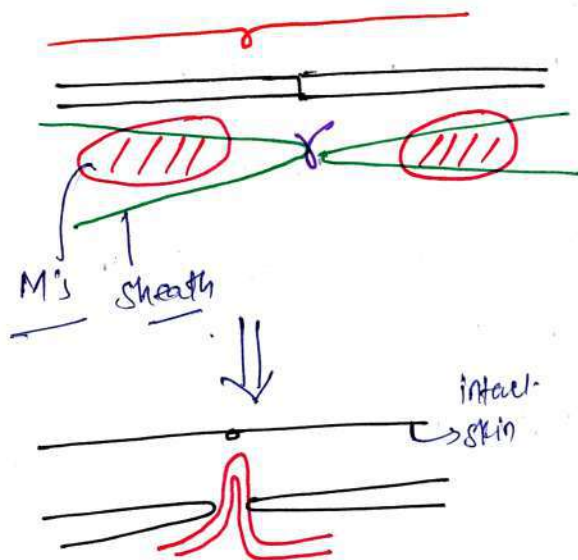
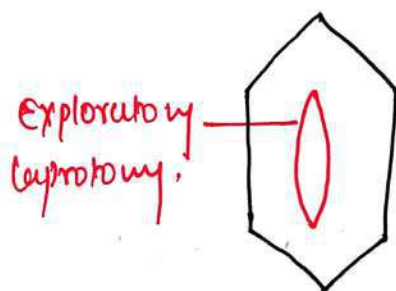
Stamper's Hernia :- Hernia through Transverse Mesocolon after Retrocolic Gastrojejunostomy

DOR ~~HA~~ **VELPAEU'S HERNIA** :- (pre-vascular) Sac located Anterior to femoral vessels.

DOR **Serafini's Hernia** :- (Retro vascular)
- Sac located post. to femoral vessels.

DOR **Holt-House Hernia** :- Inguinal Hernia - Extension of Bowel along Inguinal Lig.

- aka post-operative ventral wall Hernia
- Cause :- failure of fusion of fascial Tissue.



Q:- Long, Midline, Vertical, lower abd. Incision :- ↑ the Risk of Incisional Hernia.

Rf:-

Pt. Related

- poor Wound Healing
 - o DM
 - o HIV
 - o immunocompromised
 - o Cirrhosis
 - o Uremia
 - o jaundice

Surgeon Related

- poor technique
- closure under Tension.
- Use of absorbable Sutures.

Surgery Related

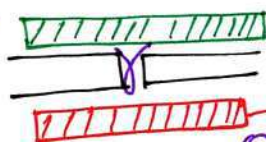
- Emergency Sx
- post-operative infec?

* Roe :- IPOM (Intra peritoneal Onlay Mesh Repair)

Advantage :- ↓ Risk > 50%

→ Onlay / Overlay :-

↓
placement of mesh above the fascial tissue / sheath



Sublay / Underlay

↓
placement of Mesh below the fascial tissue / sheath



③ Inlay / inter lay
↑ Suturing the Edges of Mesh to the fascial tissue / sheath for closure.

It arises from (or) the origin is Musculo-Aponeurotic

- It's a type of unencapsulated fibroma and it's Hard & crack on cutting
- Not a/w Sarcomatous changes Metastasis.
- It invade Surrounding structure
- Mc site:- Extraabdominal (60%) > abdo wall (25%) > intraabd. (15%)
- Estrogen stimulates the growth that's why Mc in ♀
- Sx trauma ↑ the risk that's why usually arise from Scar of previous incision
- Mc presentaⁿ:- Mass (palpable)
- Mc locaⁿ:- Infra umbilical.
- Ioc:- MRI
- Loc:- wide local incision ± 2cm Margin.
- High Risk of Rv. after Excision
- for Recurrent Desmoid:- Sx Excision + Radiotherapy

Q: Mc indicaⁿ of Splenectomy:- Trauma

Q: Mc indicaⁿ of Elective splenectomy:- I.T.P (Immune Thrombocytopenic Purpura)

- Characterized By:- formaⁿ of Auto-antibody against platelet.

↓
Ab-coated platelet are destroyed in spleen

↓
Thrombocytopenia.

C/f :- Petechia

• Purpura

• Epistaxis.

• Gum Bleeding.

* Size of spleen in I.T.P. typically $\propto$ (N).

* I.T.P Mc in child.

Rx:- ① Most of the pts are managed Medically:- By Steroid

② Cyclophosphamide

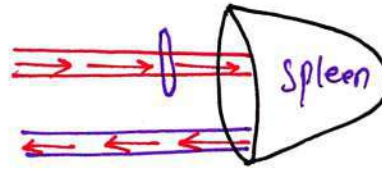
③ Azathioprine

↓ for non-responding / pt. having steroid Complicaⁿ induce

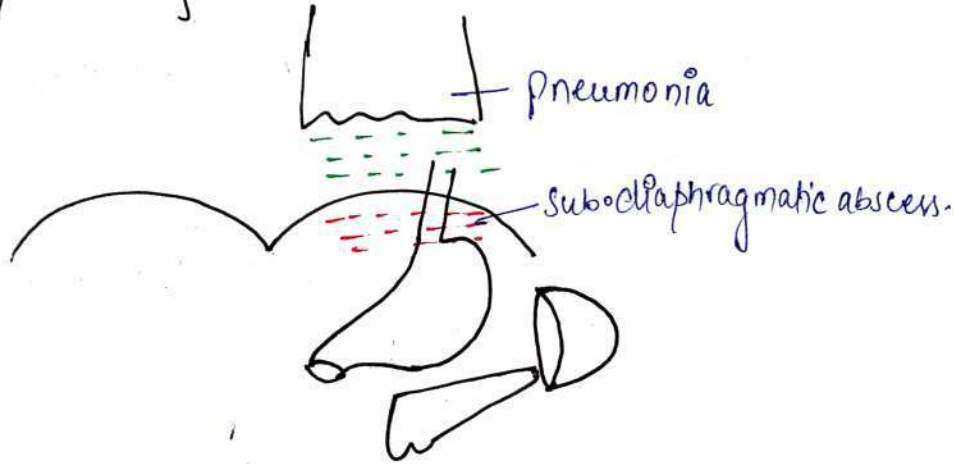
Gold std:- Laproscopic splenectomy (∵ size of spleen is (N))

Q:- ① Platelet count in Elective Sx for I.T.P :- 50 thousand

• Minimum pl. count for Elective Sx :- 11 lakhs



* Complications of splenectomy



① Lung Related :-

- i) Mc complication of splenectomy is **Atelectasis**.
- ii) Other:- pleural Effusion / Consolidation
- iii) On 3rd day of splenectomy → Consolidation
↓
develop fever & chill

Atelectasis is non-infectious cause of post-operative fever seen in 40 hrs

② Diaphragm Related:-

- ① Sub diaphragmatic Abscess.

③ Pancreas Related:-

- ① Ac. Pancreatitis
- ② Injury to tail of Pancreas.
- ③ Pancreatic fistula.

④ Thromboembolic complication:-

- ① DVT
- ② ↑ risk of Pulmonary Embolism

- 1) Seen after 2-5 Yr of Splenectomy
- 2) Mortality Rate in Established OPSI :- 40-50%
- 3) OPSI is caused by Capsulated Organism :- (I) Strep. Pneumoniae

(II) Neisseria Meningitidis - Meningococcus.

(III) Hemophilus influenza type B.

- 4) Best time to give vaccine during Elective Splenectomy :- 2 wks before Sx
- 5) Best time " " " after Emergency " :- As early as possible after Sx

SPLEEN NEOPLASM

- MC Splenic Neoplasm :- NHL
- MC 1° Benign Tu. of spleen :- Hemangioma
- MC 1° Malignant " " :- Angiosarcoma
- MC 1° for Metastasis to spleen :- Malignant Melanoma.
- MC 1° for Isolated 2° to spleen :- Ca. Ovary.

SPLEENIC CYST

- MC True splenic cyst :- Hydatid cyst (10%)
- MC Non-parasitic splenic cyst :- Pseudo-cyst (not Related to pancreas wall)
alt ↓ (70-80%)
Trauma
- 1) MC Congenital splenic cyst :- Epidermoid.
- 2) Overall MC type of splenic cyst :- Pseudo-cyst
- 3) MC site of Accessory spleen :- Hilum.

UROLOGY

KIDNEY & URETER

1) Renal stone :-

1) Calcium Oxalate :- 1) MC type of Renal stone

1) Radio-opaque

R/t 1) Hypercalcaemia

Hypercalcaemia

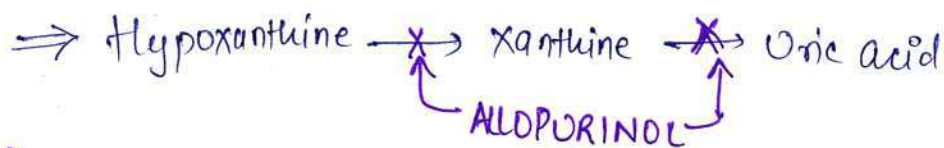
Hyperoxaluria

2) Uric acid stone :- MC Radiolucent Renal stone

1) Gout

1) Lesch-Nyhan Synd.

1) Myeloproliferative disorder



R/t: 1) High fluid intake

1) Low purine diet :- ↓ Meat, chicken,

1) Alkalinisation of Urine

1) DDL: ALLOPURINOL

3) Struvite stone / Staghorn Calculi / Triple phosphate stone / Calcium-Magnesium-Ammonium phosphate:-

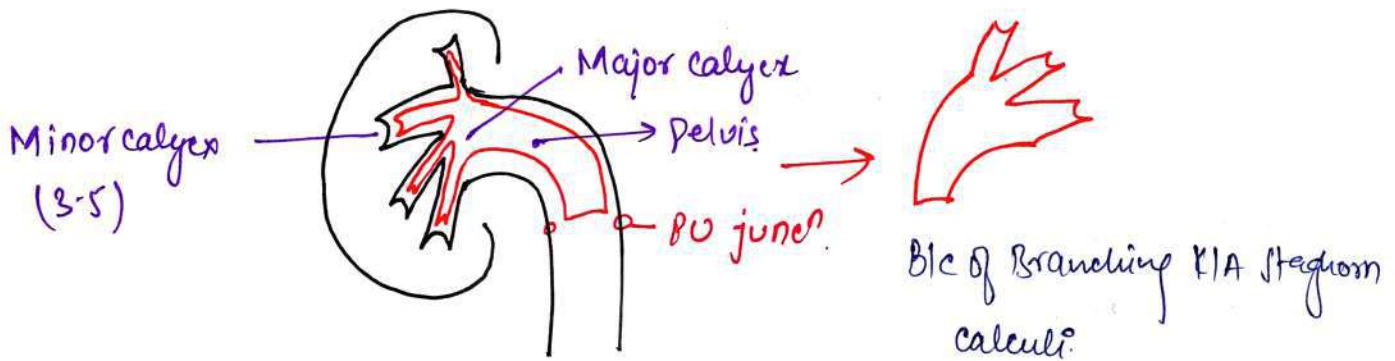
1) MC in ♀ (short urethra 4cm)

1) ↑ Risk of UTI

1) Proteus → Release Urease

Urea → www.FirstRanker.com

- 1) fills pelvi-calycal system of kidney
- 2) silent district of kidney.



Rx 1) SANDWICH Technique :- PCNL + ESWL
(percutaneous nephrolithotomy) ⊕ (Extra corporeal shock wave lithotripsy)

2) for Rx to Prevent Recurrence :- ACETOXY-HYDROXAMIC ACID (irreversible ⊖ of Urease)

④ Cystine Stone :- Cystinuria
* dlt S=S → Become Radio opaque

*  → Benzene shape / Hexagonal
- Very Hard - Not Easily Broken by ESWL

* drugs used in cystine stone :- D-penicillamine
- α-Mercapto-propionyl Glycine (α-MPG) (Preferred)

⑤ Xanthine Stone :- Xanthinuria
- Radiolucent
- Brick-Red color
- On cutting :- Show "LAMINATIONS" on cross-sec?

Hypoxanthine ~~X~~ → Xanthine

*) Radiolucent Stone.

④ Indinavir :- *) protease inhibitor

*) Radiolucent stone

⑤ Silicate stone :- Excessive intake of Antacid containing silica.

Q:- Acid stone :- $Mg - CCO$

Calcium Oxalate

Cysteine

Uric acid.

Q Radiolucent stone :- $Mg - CCO$

- Triamterene

- Indinavir

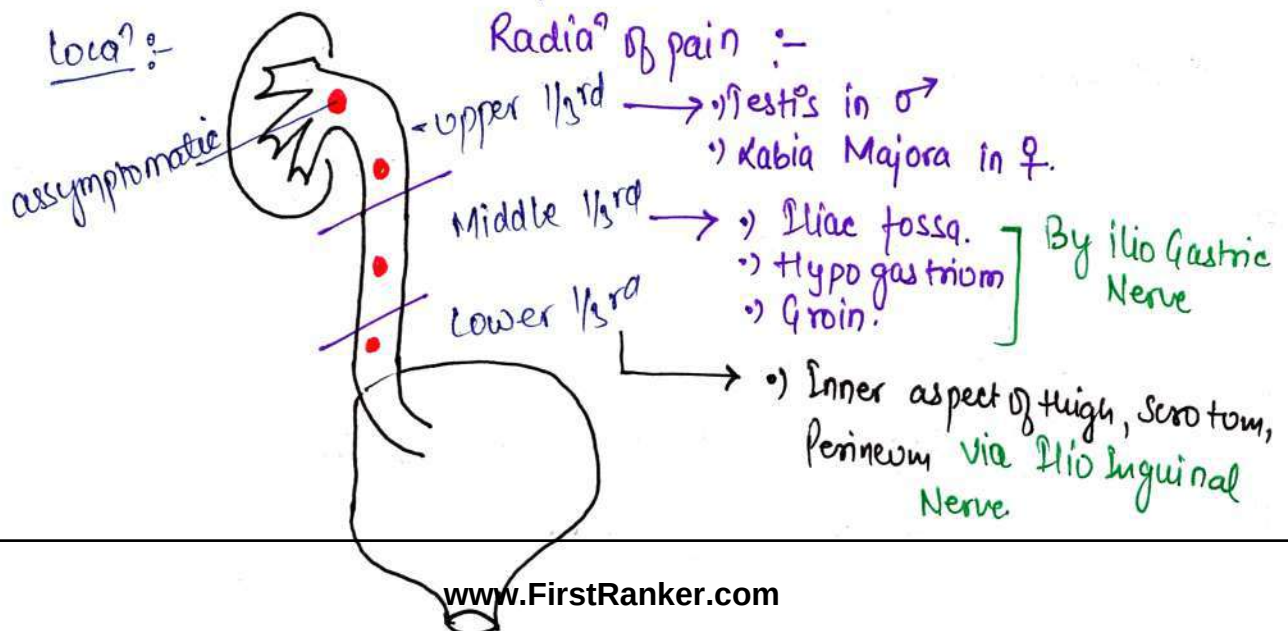
- Xanthin

- Uric acid

Q:- Renal stone :- MC in Male

Q:- Infectious Renal stone :- MC in female.

* C/P :- of Renal stone :- Abdominal pain (MC)



On Rt. side mimics - Ac. Appendicitis

On Lt. side :- Diverticulitis.

* Doc :- Non-contrast spiral CT of ureteric colic

* Doc :- DICLOFENAC (VOVERON)

* Ix in Kidney :-

① Urine $\begin{matrix} \leftarrow R \\ \leftarrow M \end{matrix}$:- See :- ① color

② pH

③ specific gravity

iv) trace of sugar/Albumin

v) RBC/WBC

vi) Pus cell - UTI

vii) Cast

viii) Crystal - stone

② Urine $\begin{matrix} \leftarrow S \end{matrix}$:- UTI ④/⑤ :- Organism Responsible and antibiotic Sensitivity.

③ 90% Renal stone $\rightarrow$ Radio-opaque

$\therefore$ 90% GB stone $\rightarrow$ Radio-lucent

④ X-ray - KUB $\rightarrow$ Can make asis. ^{but} can not detect Hydronephrosis.

⑤ USG :- Screening Ix for Hydronephrosis

⑥ IVP (Intra Venous Pyelogram) aka IVO (Intra Venous Urogram) :-

*) Used to assess Renal funcⁿ, Site of obstructⁿ and Hydronephrosis.



- ⑦ RGP Retrograde pyelogram
used to assess distal part of obstructed system

* Radionuclide Scan :-

- ① DMSA :- Dimercapto Succinic acid scan
used for
DMSA
→ Renal Morphology
→ Renal Scar
→ Renal Surface Anatomy.



- ② DTPA Scan :- Diethylene Triamine Pentacetic acid Scan.

used for :-
DTPA
↓
Doc :- Renal perfusion & funcⁿ

- ③ MAG-3 Mercapto Acetyl Glycine
→ Gold std for Renal Perfusion.

* Indicaⁿ of Conservative Mx in Renal Stone :-

- ① Single stone ≤ 5 mm
- ② Non-Dilated Ureter
- ③ Stone in lower 1/3rd of ureter
- ④ Progressive downward movement of stone.

Conservative Mx :- 1) Plenty of fluid + Alkalinizⁿ / Acidificaⁿ Urine.
(Alkasol)

2) for 4mm of stone → take 4 litre Water x 4 wks → Stone Excreted in Urine.

- ① ESWL Extra corporeal Shock Wave Lithotripsy → 85% cur
- ② PCNL Percutaneous nephro lithotomy] - 15% cur.
- ③ URS Uretroscopy]
- ④ LSS Laparoscopic stone sx] not indicated ①
- ⑤ OSS Open stone sx]
- indica → ① ~~Non~~ Stone & Non-functioning ~~non~~ Kidney
- ② Stone & anatomical disorder of Kidney (PUS obstruct)

*** ESWL :-**

① Gold std Lithotripter used:- DORNIER UNMODIFIED HM-3

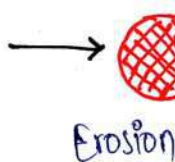
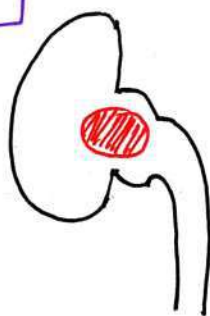
- Shock wave induced tensile cracking

• Maximum size of stone
can be removed by
ESWL:- 2cm

ERCP:- 1.5cm

Erosion & Shattering

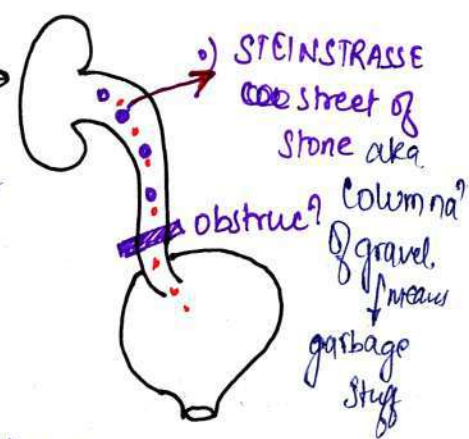
Stone fragment are Excreted in Urine via Ureter.



Erosion



Shattering



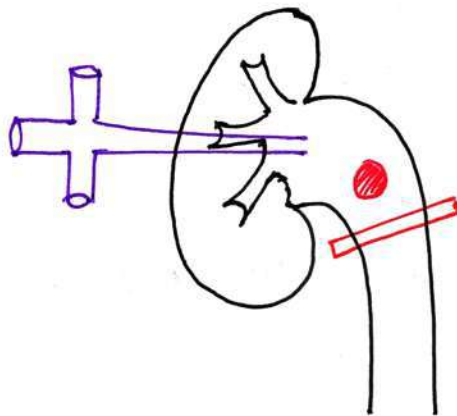
Absolute
CI:- ① pregnancy
② Bleeding disorder.

Relative

- 1) Pacemaker
- 2) UPI
- 3) Uncontrolled HTN
- 4) Distal obstruct?
- 5) obesity
- 6) Orthopedic abnormality.
- 7) Aneurysm
- 8) Renal failure

- ① Brushite
 - ② Hydroxy apatite
 - ③ Cytine
 - ④ Calcium oxalate monohydrate
- AU

* PCNL:- Percutaneous Nephrolithotomy.

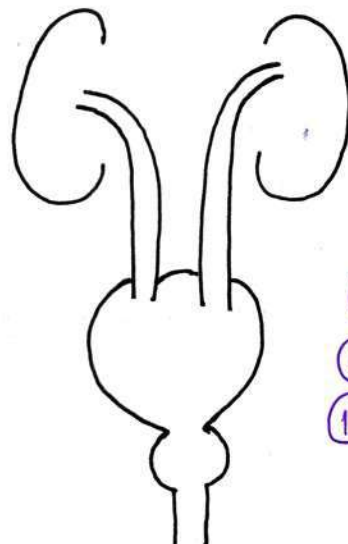


-) posterior calyceal approach.
-) Mc complication:- Bleeding
-) Mc injured organ:- pleura > colon > spleen
-) Indicaⁿ:- BHC-2
-) Indicaⁿ:-
-) Size:- > 2cm

- ① Distal obstructⁿ
 - ② UFI
 - ③ Hard stone BHC-2.
 - ④ Lower calyceal stone
 - ⑤ Staghorn calculi
- ↳ Sandwich technique (PCNL + ESWL)

:- Uretroscopy

-) performed under spinal Anesthesia.
-) Mc complication:- perforaⁿ (Ureter)



Indicaⁿ:-

- ① Removal of stone
- ② Removal of foreign body
- ③ Insertion of DJ Stent.
- ④ Taking Bx from Urothelial T.O.

Internal diameter of ureter:- 4mm.

When immunity goes down

↓
Cortical granuloma formation

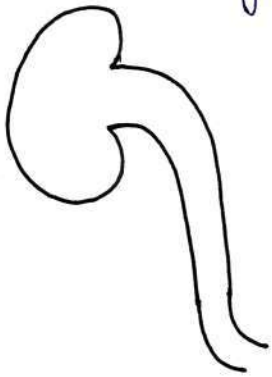
↓
Tubercular Abscess

↓ which Rupture into

Pelvi-calyceal system

↓
STERILE PYURIA (No growth & Pus cell on urine ⁱⁿ)

⊗ Earliest MC symptom:- ↑ frequency
in genito Urinary TB



⊗ Changes seen in Kidney :-

① Pelvi-calyceal stenosis @ or PUS

↓
Hydro Nephrosis & pyonephrosis

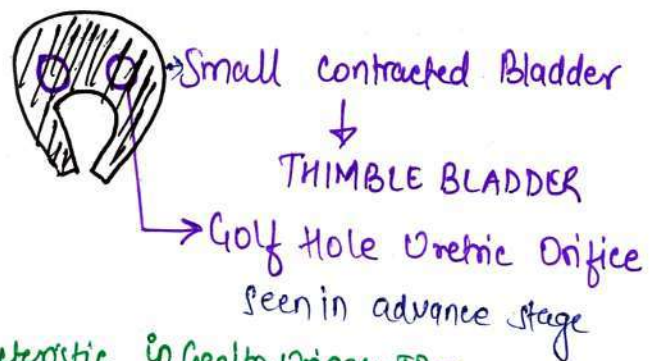
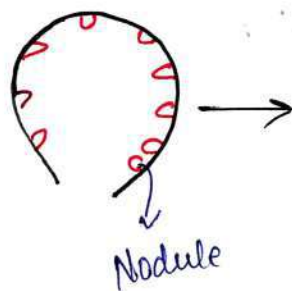
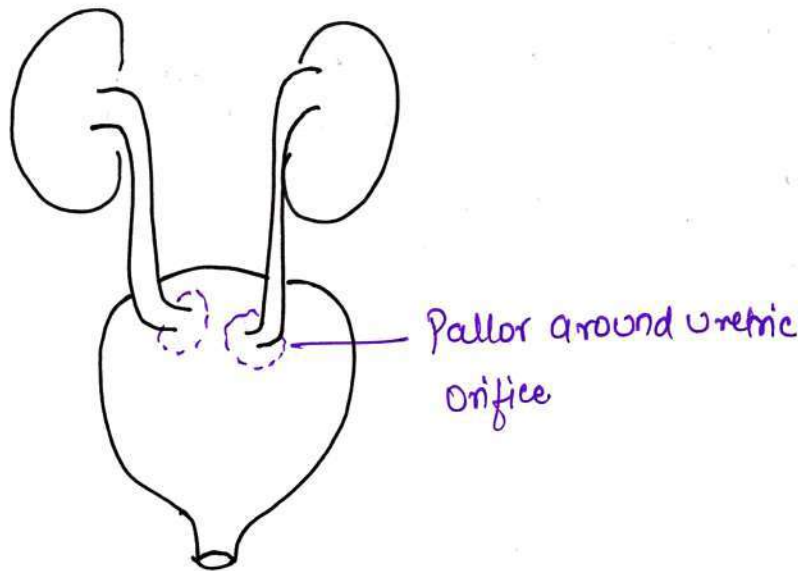
↓
Caseous Necrosis
(filled with cheesy material)
Putty Kidney

↓
Calcification
Cement Kidney

↓
Non-functioning Calcified Kidney
Auto Nephrectomy

Auto splenectomy
&
SCA

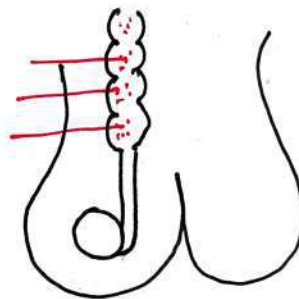
* Bladder :-



* Vas deference :-



Characteristic in Genito-Orinary TB :-
 Beaded appearance of Vas & Multiple discharging sinuses through scrotum.



*) Lab finding :- ESR :- ↑ in >90% pt.

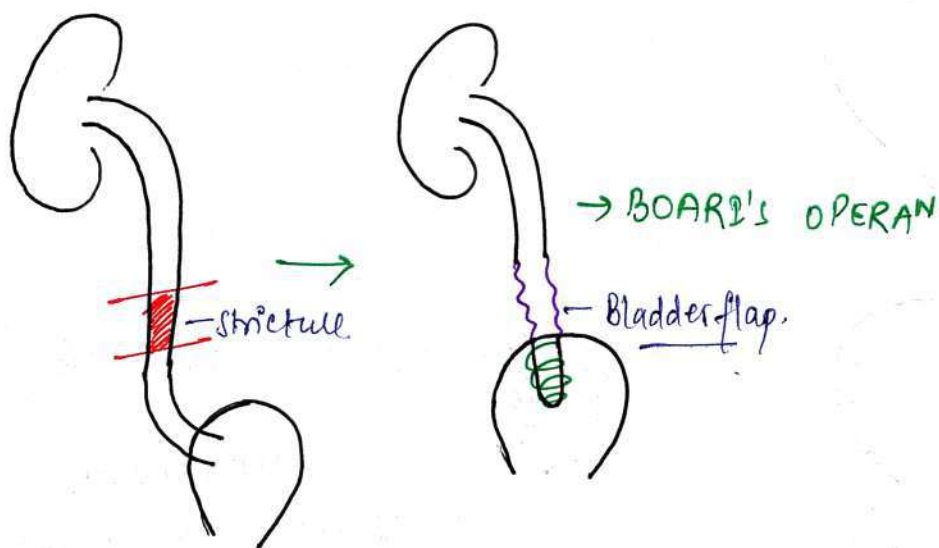
*) Ioe :- CECT

*) Earliest changes of Renal TB :- Ioc :- DUP (Early films are more informative)
 Earliest lesion are seen on DUP :- MOTH EATEN CALYX

① Stricture $\rightarrow$ Dilaⁿ

② Small contracted Bladder $\rightarrow$ Augmentⁿ? Enterocystoplasty
($\uparrow$ Bladder capacity)

③ Non-functioning Kidney $\rightarrow$ Nephrectomy
($<10\%$ on DTPA Scan)



RENAL TU.

ANGIOMYOLIPOMA $\therefore$ Benign TU.

- $\therefore$ Composed of Blood vessel + M's + fat
- $\therefore$ MC in ♀
- $\therefore$ Age $> 5^{\text{th}}$ / 6^{th} decade
- $\therefore$ also tuberculous sclerosis $\rightarrow$ pt. is ~~young~~ young, multiple and B/L.

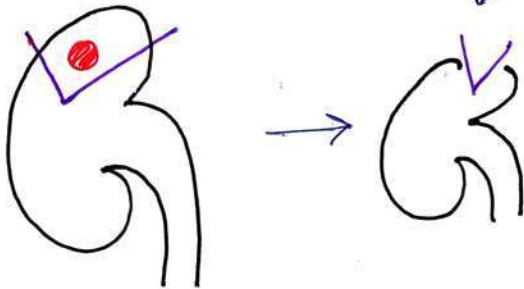
① Marker +ve in both Angiomyolipoma & ~~non~~ Malignant Lipoma - HMB-45

② Macro-Aneurysm $\rightarrow$ Retro-peritoneal H^g

$\downarrow$
occurs in 10% pt. KIA Wunderlich synd.

1) Rx: 1) Tumor < 4 cm, asymptomatic:- Observation

2) Tumor > 4 cm | asymptomatic:- Nephron sparing Sx.



RCC

* Pathological aspect of RCC:-

Q: MC Variant:- clear cell

①

MC Variant of RCC contain Glycogen and fat
↓
is
Washed away by Acetone or Alcohol
↓
cell appear clear

- VHL gene:- ③

Deletion

Translocation:-

3:6

3:8

3:11

- Arise from:- PCT

② Papillary Variant: MC type of RCC seen in pt. of cystic D's requiring Hemodialysis.

- MET gene → chr. ⑦ → Trisomy 7, 16, 17

- Arise from:- PCT

- It's also Hg & Necrosis in the Tumor

- There is Dysplasia Calcified in papillary Ca.
→ Sammoma Bodies

P :- Papillary Ca. Thyroid, Papillary Ca. of RCC

S :- Serous cystadenoma Ovary

M :- Meningioma.

③ Chromophobe:-

- Arises from Intercalated C cell of collecting duct.
- Best Prognosis.

• Plant cell appearance :-

- Relative clear cytoplasm
- fine chromatin
- Thickened memb.
- perinuclear Halo.

• Ch. lost in Chromophobe :- Multiple ch. losses

① 13
2 17
6 21
10 ④ Y
NEET

↓
leading to Extreme Hypodiploidy

④ Bellini duct Ca:-

- Rare
- arising from:- CD
- "HOBNAIL PATTERN"

Which.
Q:- Type of RCC in children suffering Sickle Cell Trait :- Medullary Variant.

8x 4x) RCC:- aka

- ① Hypernephroma
- ② Gravity Tumor
- ③ Radiologist Tumor
- ④ Internist Tumor



arises from upper pole
Gravity conclude that origin is Renal not Adrenal

Incidentally detected on Radiological

Smoker

5th decade

Rif Tobacco / Smoking

(i) Chemoanalgesic Nephropathy

(ii) Cadmium / Asbestos Exposure.

* Unique characteristic:-

(i) Pseudo-Capsule.

(ii) Refractory to cytotoxic agent.

(iii) Show Response to Biological Response Modifier.

(iv) Prolonged period of stable D's

(v) Spontaneous Regression is seen.

5 lethal Malignancy show spontaneous Regression

Mn: NCR-MR

N: Neuroblastoma

C: Chorio Ca.

R: Retinoblastoma

M: Malignant Melanoma

R: RCC

* Triad of RCC:-

↓ KIA
→ late triad

• Mass

• Pain

• Hematuria

Only seen in 10% of cases having advanced d's.

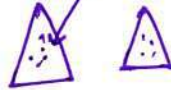
→ Mc presenta? / symptom.

* Mc Route of spread: Hematogenous.



* Fu. Thrombus can invade Renal vein, DVC & can reach upto Rth atrium

* Mc site of Met's: Lung



*) Mc Malignancy responsible for osteolytic 2^o in Male $\Rightarrow$ RCC

*) follicular Ca. of thyroid
 $\downarrow$
Osteolytic & Pulsatile 2^o.

*) Paraneoplastic manifestaⁿ of RCC $\Rightarrow$

- ① $\uparrow$ ESR (Mc) ($>55\%$ in pt)
- ② Anemia $\because$ Non-functional Mass Replaces the Kidney $\rightarrow \downarrow$ EPO
- ③ Polycythemia $\because$ Mass produces Erythropoietin
- ④ HTN $\because$ alt Renin
- ⑤ Hypercalcemia $\because$ PTHrP
- ⑥ STAUFFER'S Synd $\because$ Non-Metastatic Hepatic dysfuncⁿ

*) Ble of IL-6

*) Hypercalcemia can be completely Mx Medically $\because$
Doc $\Rightarrow$ Bisphosphonate $\because$

- *) Alendronate
- *) Pamidronate
- *) Zolendronate

*) IOc $\Rightarrow$ CECT

*) Doc for Ass of Vascular Invasion $\Rightarrow$ MRI

*) Gold std " " " " $\Rightarrow$ Venography / vena cavagrapky

Roc $\Rightarrow$ Radical Nephrectomy

* 1st line agent for advanced Metastatic RCC $\Rightarrow$ Sunitinib

* 2nd " " " " " " $\Rightarrow$ IL-2 + IFN- α

Indicaⁿ of Nephron Sparing Sx in RCC :-

- ① Size of RCC upto 4cm
- ② RCC in Solitary Kidney (pt. have only 1 Kidney in his body).
- ③ B/L RCC
- ④ RCC & w's contralateral Kidney (i.e Renal artery stenosis)
→ ACEI & C/I.

* During Radical Nephrectomy :-

- 1) Structure hooked 1st :- Renal Vein
- 2) " Ligated 1st :- Renal artery

Pediatric T₀

- Q:- MC intra abdominal Malignancy in children :- Neuroblastoma
- Q:- MC Extra cranial Solid Malignancy in children :- Neuroblastoma
- Q:- 2nd MC intra abdominal Malignancy in children :- Wilms T₀.
- Q:- MC 1^o Renal Malignancy in children :- Wilms T₀.
- Q:- MC Renal T₀ of infancy and childhood :- Congenital Mesoblastic Nephroma
- Q:- MC soft tissue T₀ in children :- Rhabdomyosarcoma
- Q:- MC Solid Malignancy of childhood :- Brain T₀.
- Q:- Overall MC Malignancy of childhood :- ALL (Leukemia)

- MC 1^o Malignancy of childhood
- Age:- 2-5 Yr of age.
- Component:-

B :- Blastema

E :- Epithelium

ST :- Stroma.

- Gene:- WT, & WT₂ $\Rightarrow$ ch. 11.

- Variants of Wilms to:-

① WAGR Synd.

W - Wilms

A :- Aniridia

G :- Genital Anomaly

R :- Mental Retardation

② Denys-drash synd

- Gonadal dysgenesis - Male pseudohermaphroditism.
- Renal failure.

③ Beck with man Synd:-

- 1) Hemihypertrophy
- 2) Visceromegaly $\rightarrow$ (Hepatomegaly and splenomegaly)
- 3) Macroglossia (Enlarge Tongue)
- 4) Hepatoblastoma
- 5) Omphalocele

* Triad of Wilms :-

Mass

fever:- It's characteristic b/c it disappear after No. Resec?

Hematuria

- 1) Mc site of Mets: Lung.
- 2) Doc: MRE for better definition of Nephroblastoma Element.
- 3) Rx: Doc: Radical Nephrectomy

Q:- Most imp. prognostic factor for Wilms' Tu:- Histology > Stage

(*) Most imp " " for most of Malignancy:- Stage

NEET Q:- When Histological variety is adversed :- Chemo s/b started in 5 days and Radiotherapy s/b started in 10 days

→ Staging:- 2 type

Pre-chemotherapy Staging

- followed by National Wilms' Tu. Staging Group (NWTSG)

→ In pre-chemotherapy staging:- ~~Sx~~
~~chemotherapy is given before~~
Sx and Staging is done before
Chemo therapy

Post-chemotherapy staging

- followed by International Society of pediatric Oncology (SIOP)

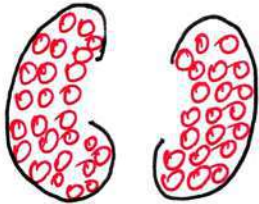
→ Sx and staging is done after
chemotherapy

ADPKD

- AD

- Ch: 16, 4

- protein abnormal: Polycystin



• B/L Kidney have cyst

• Kidney loses its funcⁿ of concⁿ

↓
UT polyuria

- Mc Manifestaⁿ: HFN $\left\{ \begin{array}{l} 75\% \text{ Adult} \\ 25\% \text{ children} \end{array} \right.$

- dlt compression: • ↑ stone formaⁿ & ↑ infecⁿ
↓
Hydronephrosis.

• Hematuria,

• Polyuria

• Nocturia.

- MCC of death: CRF.

- Mc Extra Renal Manifestaⁿ:

- ① Polycystic liver D's
- ② cyst in Ovary, Pancreas, spleen
- ③ colonic diverticulitis
- ④ Berry's aneurysm
- ⑤ Mitral valve prolapse
- ⑥ Arachnoid cyst - 8%
- ⑦ cyst in Seminal vesicle

* Cyst never seen: LUNGS



•) BELL SHAPED

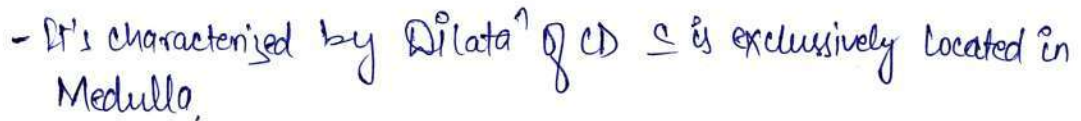
-) Bubble appearance

-) Swiss-cheese appearance.

ROUSING'S OPERAN² :- deorobing of cyst in ADPK. (cyst ko phod do)

MEDULLARY SPONGE KIDNEY

- AR.



- 2's also Hemi-hypertrophy

② Hypercalcemia

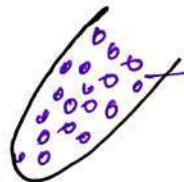
③ Nephrolithiasis

④ Nephrocalcinosis

→ Stone in Kidney

- Deposiⁿ of Ca^{2+} in Renal parenchyma

2) Loc :- WP :- BRISTLES OF BRUSH APP.



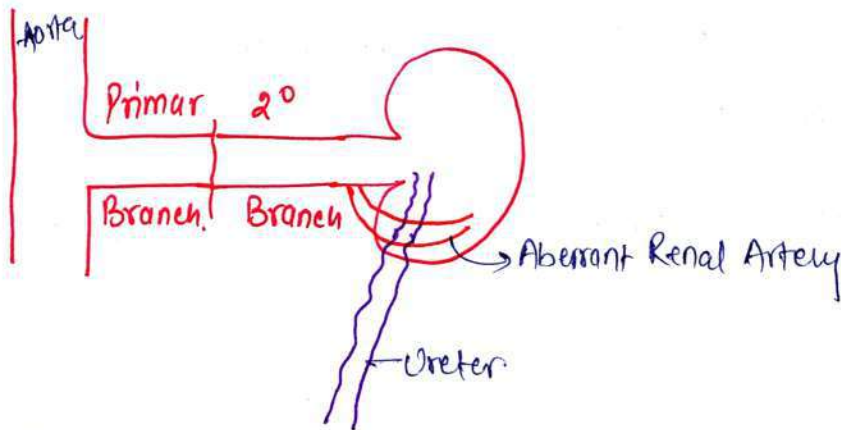
→ BOUQUET OF FLOWER.

• Rx: just Management of complicaⁿ as cure is not available.

Q MC Renal vascular abnormality $\rightarrow$ Supernumerary Renal artery

Renal vein is less common

- MC on (Rf) side
- Supplies lower pole



- Aberrant Renal artery compress the Ureter @ PUJ

↓ UT

PUJ obstruct

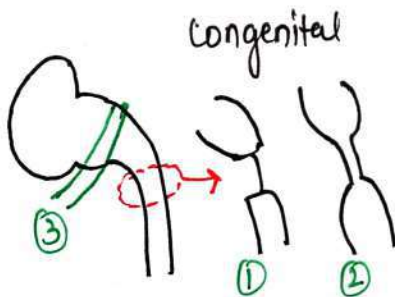
- Doc:- Angiography.
- Rxc:- Pyloplasty
- Artery should not be divided.

↓ B/c

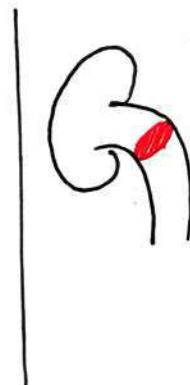
division can LIT lower pole infarct

Posterior-Ureteric junct Obstruct

- MC in Boys.
- Usually Unilateral
- MC on (Rf) side.



- 1- Atresia of ureter @ PUJ
- 2- Stenosis " " "
- 3- Aberrant Renal artery.



Acquired

- (i) Stone
- (ii) Infect
- (iii) Instrumentation.

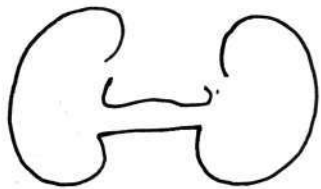
Mc presentaⁿ: palpable intra abd. pain

Doc: DTPA Scan.

•) DTPA Scan Replaced IVP as Doc.

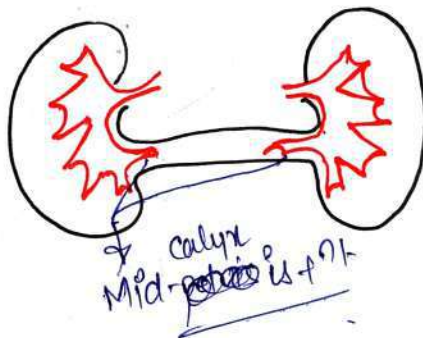
Roc: ANDERSON-HYNES DISMEMBERED PYELOPLASTY.

HORSE-SHOE KIDNEY.



- Kidney fused @ lower pole
- 1:400 live birth (0.25%)

1:1000 n n (Unilateral Renal Agenesis)
1:250 n n (Hypospadias)

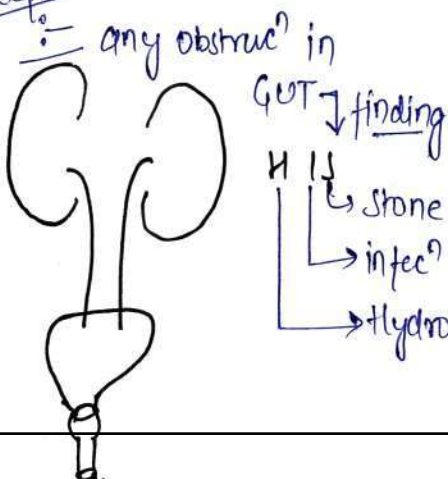


- ① inferior mesenteric artery prevent ascended.
- ② level of isthmus: L3-L4
- ③ Axis of Kidney: Vertical
- ④ Orientaⁿ of calyx: Medial in isthmus
- ⑤ High insertion of ureter and anterior Transposition.

* ON IVP: HAND JOINING dlt Medial orientaⁿ of calyx

flower vase like curve of ureter dlt high insertion of ureter & anterior Transposiⁿ

concept



- finding
- Stone
- infectⁿ
- Hydronephrosis.

Clf: •) Mostly asymptomatic and it used incidentally on Radiological Ex

•) Insymptomatic pt. > Risk of stoneformaⁿ, infectⁿ, hydronephrosis.

Ioc: CECT

X: Management of complicaⁿ Isthmus should not be divided.

Q:- MC Congenital abnormality of Urogenital Tract :-

VUR

↳ Both are AD.

DUPLICATION OF URETER.

-AD

Incomplete duplicaⁿ

aka

1) **BIFID URETER**

2) Y-Y REFLEX :-
of contrast
Reflex in both limb
of ureter on RGP.

3) WIEGERT-MEYER'S

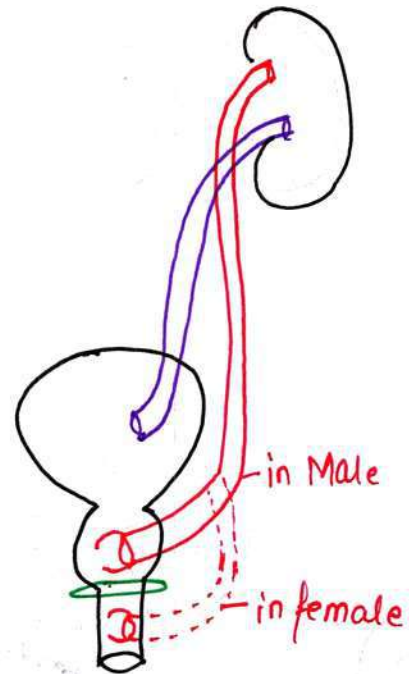
Rule :-

1) Seen in complete
duplicaⁿ

2) Rule :- upper pole
ureter - caudal (distal
and medial to the
lower pole ureter.

Complete
duplicaⁿ :-

Complete duplicaⁿ



* 2 problems :- 1) Upper pole ureter is having :-

Ureterocele

2) Lower pole ureter is having

VUR

3) Upper pole ureter is having

Ectopic Orific

1) In male it opens into prostatic urethra

2) In f :- " " " Anterior urethra

in ♀:- Continuous incontinence & dribbling of urine & (N) voiding pattern.

* for upper pole ureter having Uretrocele :- Doc IUP



ADDER HEAD | COBRA HEAD

* for lower pole ureter having VUR :- Doc → MCU

MCU is Doc :-

- ① VUR
- ② Postherial Urethral Valve
- ③ " " stricture

∴ Rx ① for VUR :- Uretro Vesicoplasty

② for upper pole ureter having Uretrocele :- Excision & Reimplant into bladder

URETROCELE :-

1) It is characterised by cystic dilatation of terminal part of ureter.

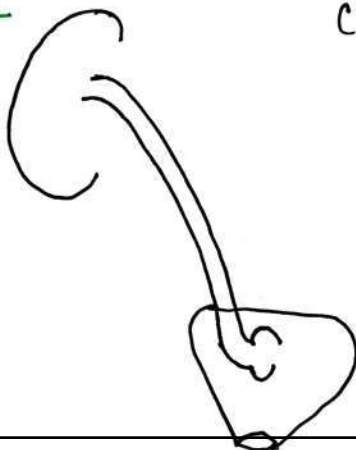
2 type :-

① Intra Vesical :- (20%)

② Ectopic :- (80%) (MC)

Intra Vesical :-

Rx :- Incision over the Cyst wall.



CLF :- MC presentaⁿ :- ↑ risk of infecⁿ

1) Complicaⁿ :- ↑ risk of stone formaⁿ & Hydro nephrosis.

USG :- ① cyst in bladder & Hydronephrosis.

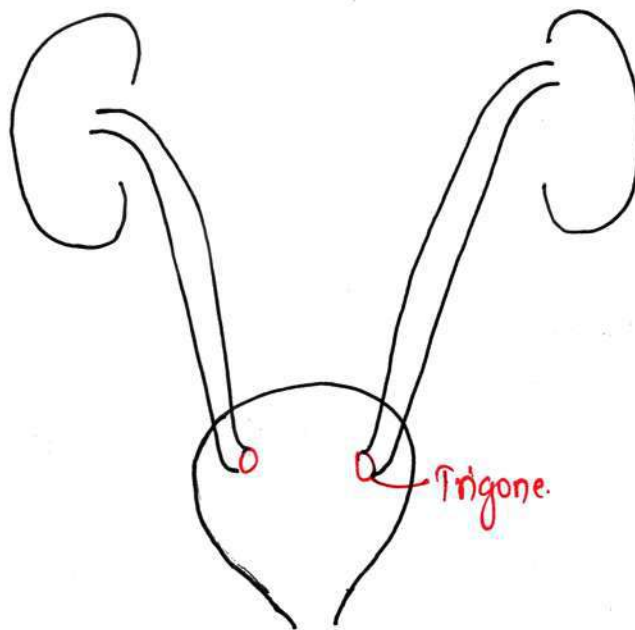
cystoscopy :- Enlarging & collapsing of cyst

IUP :- Adder Head | Cobra Head.

VUR

- AD

- MC Congenital abnormality of Urogenital Tract.
- It is MC in children
- In most of the cases Spontaneous Resoluⁿ occurs.



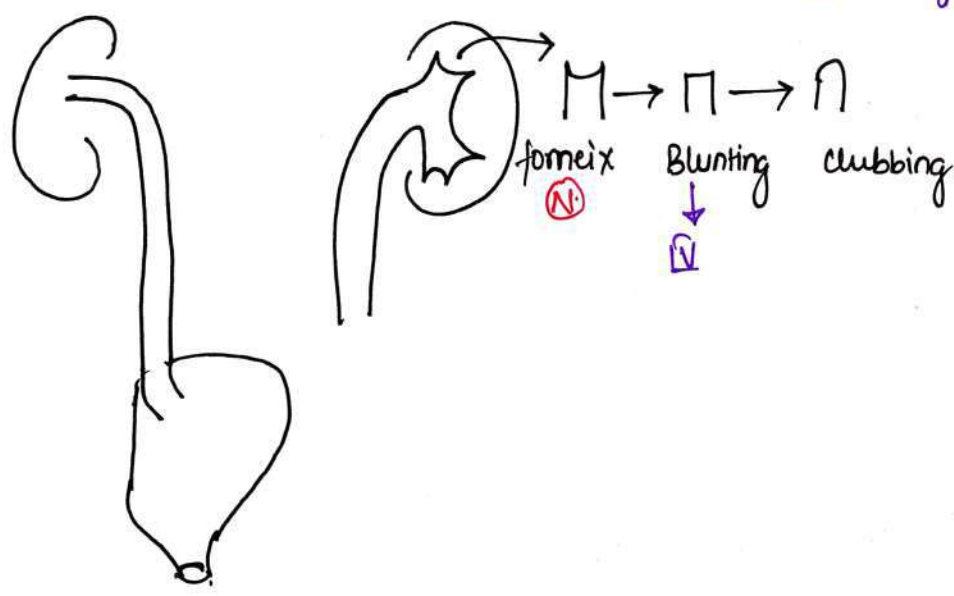
Cause:- Primary

- ① Short Intra Vesical length
- ② Deficiency of longitudinal m's over Surface of ureter
- ③ Attenuaⁿ of Trigone (weakness)

Secondary

- ① Posterior Urethral Valve in children.
- ② Neurogenic Bladder in Adults.

*) Doc:- MCU

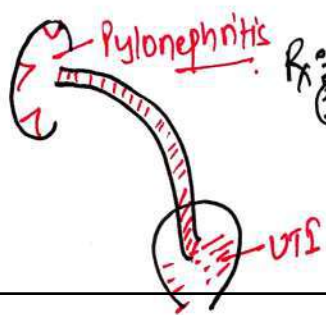


GRADE:-

- I :- Reflux into non-dilated Ureter
- II :- Reflux into pelvi-calyceal system.
- III :- Mild to Moderate dilatation of Ureter & Reflux into Pelvi-calyceal system.
- IV :- Reflux into Pelvi-calyceal system & Blunting of foveix
- V :- " " " " " Dilated and Tortuous Ureter

* Grade I & II :- Spontaneous Resoluⁿ occur - 80%.

III :-	"	"	"	% - 50%
IV :-	"	"	"	% - 20%
V :-	"	"	"	% - 0-5%



Prophylactics are recommended in all the Grade of pt :-
 1) for children upto 6WK :- Ampicillin / Amoxicillin
 2) >6WK :- TMP-SMX (SEPTRAN)

① Grade I - II VUR

② VIL Grade IV VUR

③ Indicaⁿ of sx:-

① BIL Grade IV VUR

② Grade IV VUR

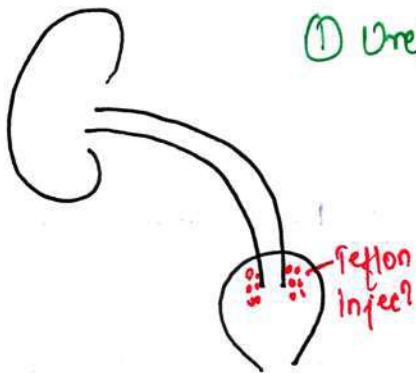
③ Older children

④ Recurrent infecⁿ despite of Medical Mx

⑤ Permanent Scar in the Kidney dlt pylonephritis

6) Bladder diverticula ↑ risk of infecⁿ.

① Uretero Vesicoplasty



→ KIA STING OPERA ②

↳ Subureteric Trans Urethral infecⁿ of Teflon paste

DNB ③ for Reconstruct:-

① LICH - GREGUIR TECHNIQUE (preferred)

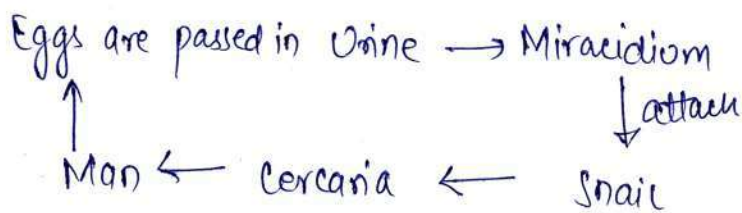
② LEAD - BETTER POLITANO TECHNIQUE



trigone not able to close orifice.

★ SCHISTOSOMIASIS (BIHARXIASIS)

- Hematobium :- Bladder
- Japonicum :- Liver, SI
- Mansoni :- Large Intestine.
- Middle East, Egypt, Africa
- Definitive Host :- Man
- Intermediate Host :- SNAIL



CF: ① Swimmers itch :- Itching sensaⁿ @ the site of penetraⁿ of Cercaria in 24 hr.

② Katayama fever :- Egg laying occurs in Sub Vesical Venous plexuses

Egg lodges in peri-vesicle (Bladder) venous plexuses
 ↓ go to
 sub-vesicle plexuses

Mounts strong inflammatory Response

- 1) High grade fever, chills and Rigor
- 2) Urticaria
- 3) Hepato splenomegaly



Cystoscopy :-

→ Sandy patches in the Bladder wall



Bladder Calcificaⁿ :- Mcc world wide

- Mc Male

- Mc Earliest symptom of Renal F.B & schistosomiasis
 ↑ frequency.

* fetal Head in Pelvis appearance dlt- Bladder Calcifica?

* Ioc:- Urine Microscopy:- presence of Egg in Urine is diagnostic

Roc:- DOC:- PRAZIQUENTEL

METRIFONATE

OXAMINIQUE

BLADDER STONE

1) 2 type:-

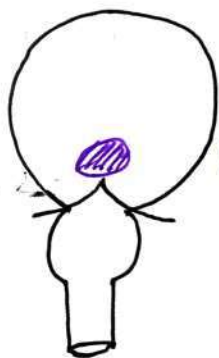
Primary

- Stone is formed in the bladder in absence of Anatomical, functional, infectious or Obstructive factor

Secondary

- Stone is formed in Bladder dlt-

- 1) Anatomical
- 1) functional
- 1) Infectious
- 1) Obstructive factor.



MIGRANT Bladder Calculi

:- Stone coming from Kidney and Retained dlt distal obstruct

1) Primary Bladder Stone :- ENDEMIC BLADDER CALCULI

- Seen in Undeveloped Country:-

- (i) Burma
- (ii) Indonesia
- (iii) Thailand.
- (iv) Africa.

- Age :- 2-4 yr

- Predisposing factor:-

- (i) Ch. dehydratⁿ
- (ii) High. Carbohydrate diet.
- (iii) Exclusive Milk
- (iv) Low phosphate intake.

* Types of stone:-

• Ammonium urate > Calcium Oxalate

• Ch. laxative abuse LIT formaⁿ of Ammonium urate stone

* It rarely occurs after Rx.

⇒ Secondary Bladder stone

- MC in Elderly Male B/c of BPH

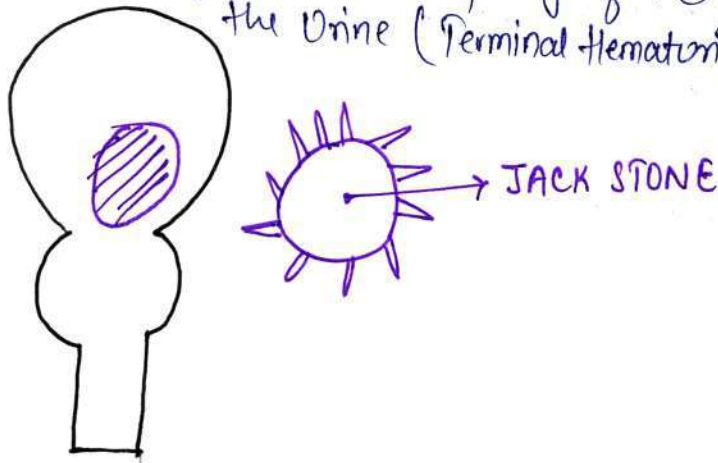
- MC type of stone:- Uric acid > Struvite

- Most of the Bladder stone are Radiolucent.

Predisposing factor:-

- (i) Bladder Outlet obstructⁿ / BPH
- (ii) Neurogenic bladder
- (iii) Prolong catheterizaⁿ
- (iv) foreign body
- (v) Bladder diverticula.

painful intermittent voiding & severe pain @ the end of Micturition & passage of 1-2 drop of Blood in the Urine (Terminal Hematuria)



* Doc :- USG

* Rx :- for small stone :- Cystolitholapaxy

Large stone :- ① Electrohdyrolic lithotripsy

② Suprapubic cystolithotomy

ECTOPIA VESICAE (EXTROPHY BLADDER)

Caused by :- Abn Overdevelopment of Urogenital Sinus



Rupture of Ventral wall

- Also Musculo skeletal defect in Intra Umbilical Region.

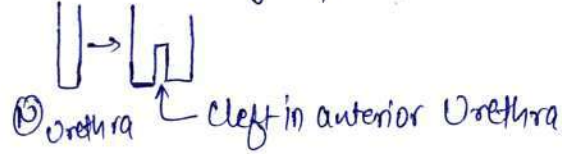
Characteristic feature :- ① Absence of Intra Umbilical Abd. Wall

② Widely Separated pubic Rami

③ Absent Ventral wall of Urinary Bladder & exposed posterior wall & Urine dribbling from Trigone.

Other associaⁿ :- Male :- Epispadias & Undescended testis & Shallow Scrotum.

- Umbilical Hernia
- Rectal prolapse.



- It ↑ the risk of **Adenocarcinoma.**

Rx: ① Augmenter? Enterocytoplasty

② Abdominal wall closure after **post-iliac bone osteotomy** to correct of underlying Associated defect.

Bladder Rupture.

- ① Extra-Peritoneal (80%)
- ② Intra-Peritoneal (20%)

Bladder: - Extraperitoneal
when Bladder full → Intra peritoneal



* Extra-Peritoneal bladder Rupture :-

→ MCC :- RFA to Pelvic bone #

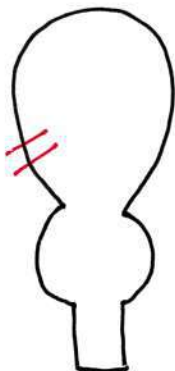
Symptoms:- Suprapubic pain ⊕ difficulty in passing Urine ⊕ Hematuria

Do cystography

↓ sign

- Flame Sign
- Tear drop bladder
- Pear-shape bladder

Rx:-

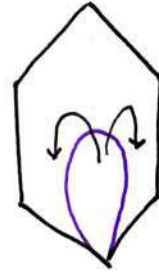


→ Foley's Catheterizing? → Tear heal spontaneously in 7-10 day.

- * Indicaⁿ of Sx:- ① Repeated occlusion of Catheter b/c of ongoing Hematuria
- ② Tear near Neck of Bladder b/c it < 1 f incontinence
- ③ Bony fragment impinging over the bladder wall.

Cause:- External Blow / Kick to full bladder

Clf:- Suprapubic pain
 Difficulty in passing Urine
 Hematuria
 Peritonitis



Ioc:- Cystography

Rdc:- Exploratory laprotomy ⊕ Peritoneal lavage ⊕ Repair of bladder defect.

CA. BLADDER

Concept
 Renal pelvis H/U
 Bladder :- Tcc

- Mc histological type:- Transitional > Sq. cell > Adenoca.
 cell Ca. (Tcc) (Scc)

Rlf:-

Tcc

Scc

(I) Smoking

(II) Drugs:-

- Phenacetin
- Chloroquine

(III) Cyclophosphamide

(IV) Exposure of:-

- Benzidine
- Hydrocarbon
- Aniline
- Acrolein
- Beta-Naphthylamine

(V) Printing, Dyeing, petroleum, Automobile, Rubber leather

(VI) Schistosomiasis

(VII) Pelvic Irritation

(I) Ch. Inflammation:-

- Schistosomiasis (Sq. & Transitional)
- Stone
- Bladder diverticula
- Ch. ~~Catheterization~~ Catheterization?

*) Nodular and invasive

Rx:- Radical cystectomy

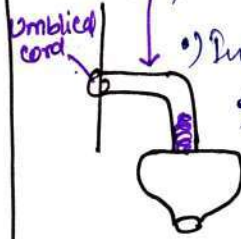
R/f:- Ectopia Vesical.

*) Patent Urachus

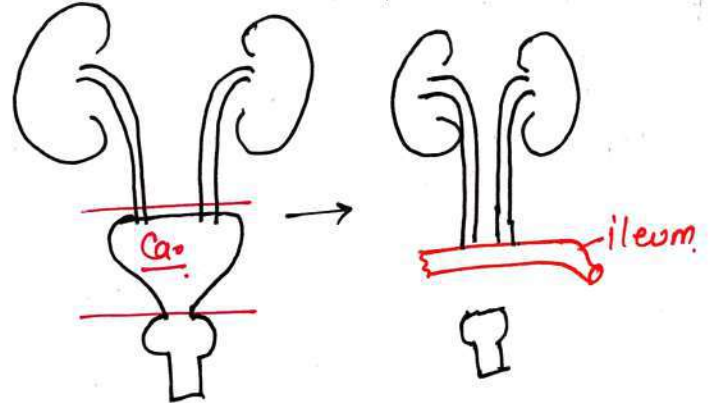
*) Intestinal Conduite

*) Augmental Enterocystoplasty.

Small intestine.



Intestinal Conduite



*) Adeno. Ca. alw LN Metastasis.

MC involved LN group → Pelvis

↓ same MC
Obturator

Rx:- Radical cystectomy ⊕ Pelvic lymphadenectomy

Ca. Bladder :- Typically Transitional

- Elderly Male smoker

- MC site



Postero-lateral wall of Trigone

- C/f:- characterized by :- Painless Gross Intermittent Hematuria

*) LN involved → Pelvis → Obturator.

- MC Route of spread:- Hematogenous.

1. Ca. Bladder
2. Malignant Melanoma
3. Medullary Ca. of thyroid.

* Ioc:- Cystoscopy + Bx

* Loc staging of Ca. Bladder:- MRI

for Pelvic Structure
Ca. for staging
↓
do MRI mostly

Rx: ① T1S KIA Malignant cystitis → Intra Vesicle chemotherapy
② T_a (Benign papillary Tu.) aka KISS ULCER



TUR (Transurethral Resec)

T_a (Single, low grade, Non-Recurrent) → TUR

* T_a (Multiple, high grade, Recurrent) → TUR + Intra-Vesicle chemotherapy.

* T₁ → Rx:- TUR + Intra Vesicle chemotherapy

③ T₂-T₄ → Radical Cystectomy ± chemotherapy ± Radiotherapy (systemic)

* Systemic chemotherapy Regimen :-

MVAC:- Methotrexate
Vinblastin
Adriamycin
Cisplatin.

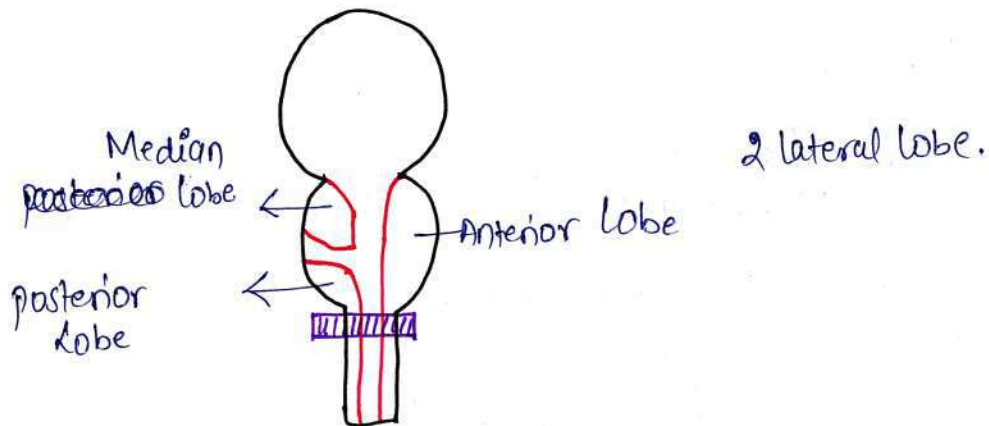
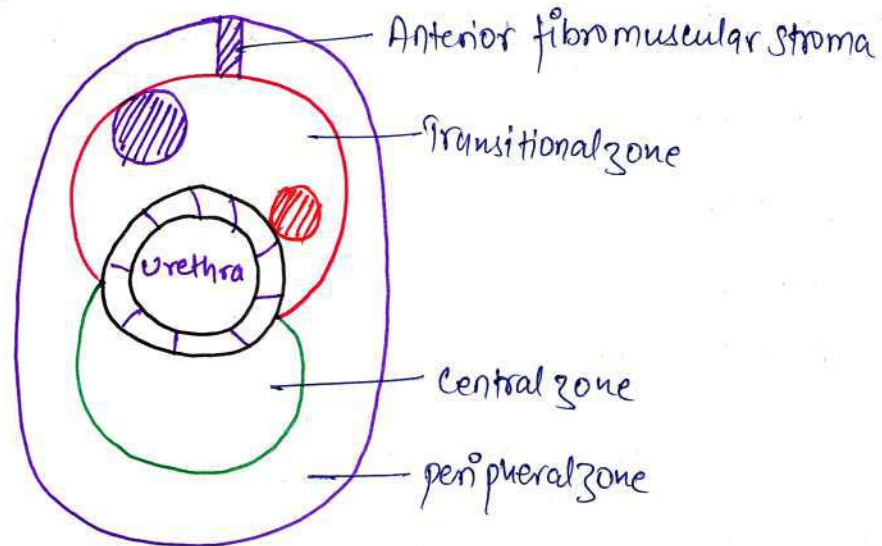
~~Cyclophosphamide~~
because
Ca. Bladder

X) Any T, N+, M+ :- Neoadjuvant systemic chemotherapy
+/- Sx / palliation

PROSTATE

(N) anatomy:-

McNEAL
ZONE



* BPH is Mc in Median lobe

* Ca. prostate Mc in posterior lobe

* BPH Mc in Transition zone.

* Ca. prostate - Mc in Peripheral zone.

* There is no correl. B/w size of Prostate and severity of symptom

* Most pt. of Ca. prostate are asymptomatic in initial stages.

* Doc for screening of Ca. Prostate:- DRE + PSA

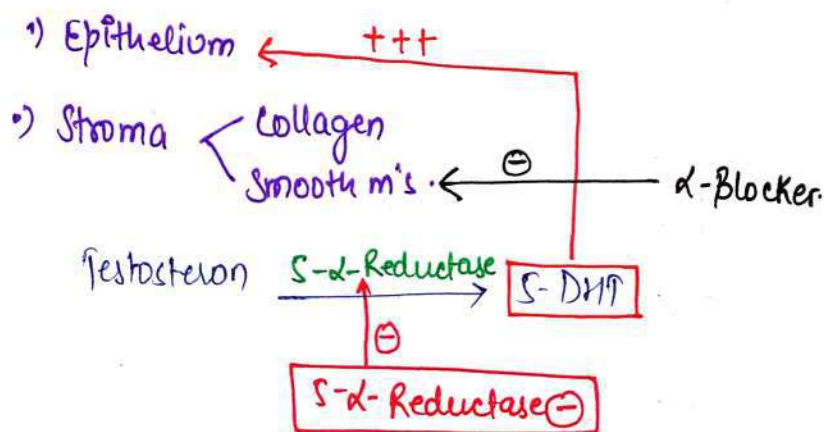
* TURP is not protective for Ca. Prostate that's why DRE + PSA is done for Screening even after TURP.

BPH

Benign Prostatic Hyperplasia

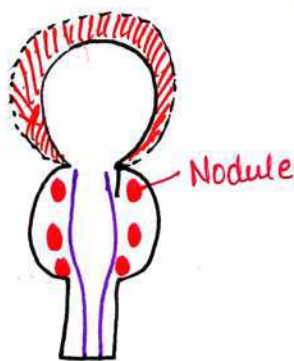
- Age Related, Endocrine controlled Multifactorial process.
- Why Age Related :-
 - 41- 50 :- 20%
 - 51- 60 :- 50%
 - 80yr :- >90%
- It is under Influence of TESTOSTERONE
- Mc site :- Transition zone

A) 2 part of BPH :-



* 5- α -Reductase $\ominus$ Req. minimum ① month to act and Maximum effect is seen after 6 month

* α -Blocker are instantaneously active and that's why its preferred.



Secondary changes in Bladder :-

- 1) Detrusor Hypertrophy
- " Hypertrophy

Collagen deposition and fibrosis
↓ responsible for

Irritative symptom :- m :- FUN

F - frequency

U - Urgency

If :- Obstructive symptoms :-

(i) Hesitancy

(ii) Intermittancy

(iii) poor flow

(iv) poor stream

(v) incomplete evacuaⁿ of Bladder $\bar{c}$ Residual Vol. of urine.

Irritative symptoms :- FUN

F - frequency

U - Urgency

N - Nocturia,

* IPSS :- International prostatic symptom Score

* DRE :- In BPH :- smooth Elastic Enlargement of prostate

Ca-Prostate :- Enlarged, Hard $\bar{c}$ Obliteraⁿ of Median Sulcus.

* Ix perform :- UROFLOW METRY :-

1) $Q_{max} \geq 15 \text{ ml/sec}$ (N)

2) $10-15 \text{ ml/sec}$:- Equivocal

① 3) $< 10 \text{ ml/sec}$:- Suggestive of Obstrucⁿ

↳ (also seen in Neurogenic Bladder)

Cystometry :- ② Bladder pressure $> 80 \text{ cm H}_2\text{O}$

Diagnostic criteria :- 1+2
of BPH

Rx :- Medical

① α -Blocker :-

1) Prazosine

2) Terazosine

3) Doxazosine

4) SILDOSIN ^{DNB}

5) TAMSULOSIN :- α_1A Selective Blocker (Doc)

~~Tamsulosine~~

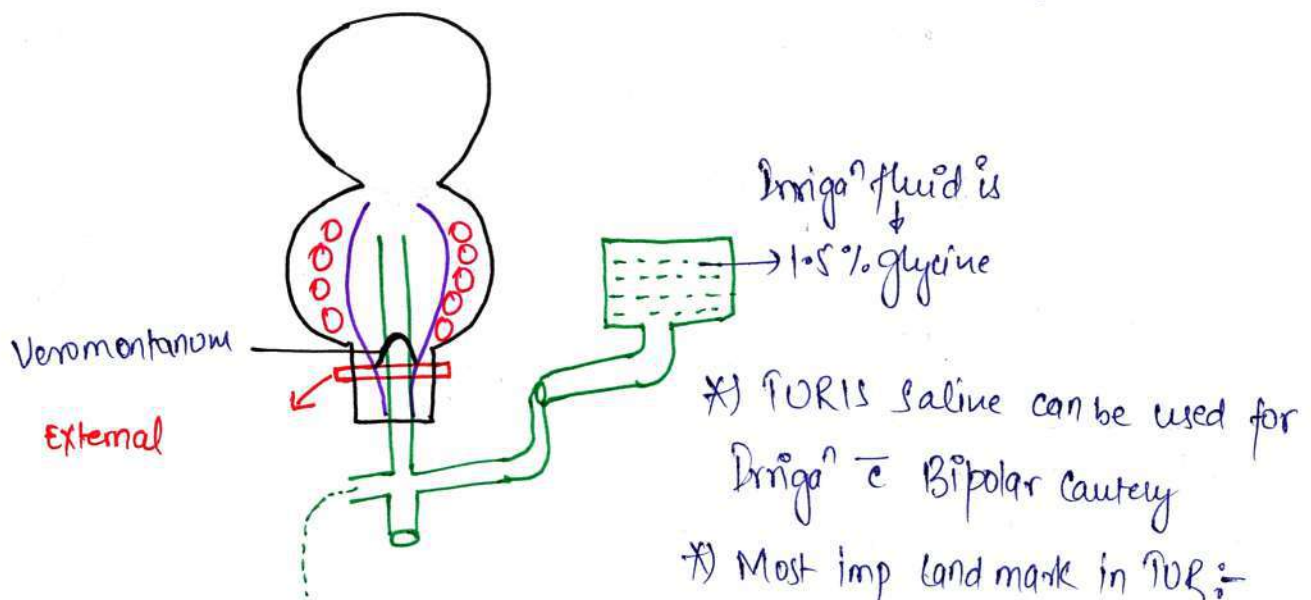
- Finasteride
- Dutasteride
- Triptorelin Pamate

Q: combinaⁿ & usgiven → if size of prostate is large & raised PSA.

② Indicaⁿ of Sx:-

- ① No improvement on Medical Mx
- ② Recurrent infecⁿ / UTI
- ③ Hydronephrosis / Renal failure
- ④ Refractory Urinary Retenⁿ
- ⑤ Bladder stone.
- ⑥ Gross Hematuria.

Gold std. Rx:- ① TURP (Transurethral Resecⁿ of Prostate)



2 technique of TURP:-

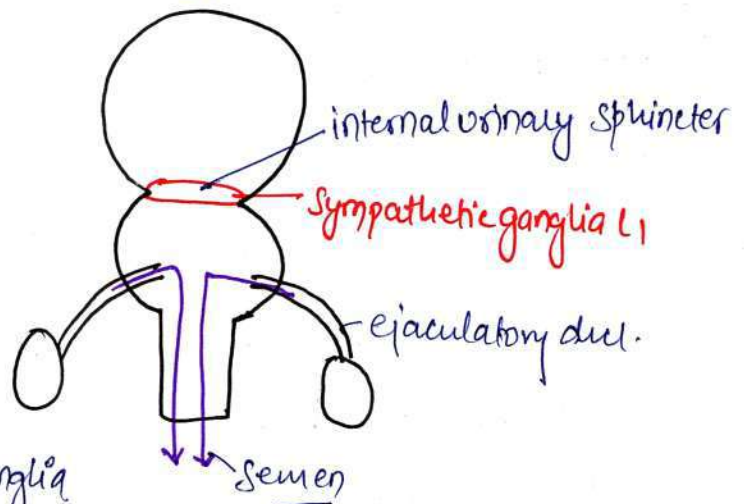
- ① NESBIT Technique:- Preferred
- ② MAUER-MAYER

- Complicaⁿ of TURP:-
- (i) Retrograde Ejacula (15%) (MC)
 - (ii) Impotence (10%)
 - (iii) Incontinence (<1%)

Cause

* Retrograde Ejacula:-

- (1) TURP
- (2) α -Blocker
- (3) B/L Lumbar Sympathectomy
 $\bar{c}$ Removal of Sympathetic ganglia (L1-L5)



MC
*) Late Complicaⁿ of TURP:-

- Bladder Neck Stenosis (4%) (MC)
- Urethral Stricture (3.6%)

*) TUR Synd aka water intoxicaⁿ / Dilutional Hyponatremia:-

- Rf:-
- Size of prostate > 75gm
 - Duraⁿ of TUR > 90min.

Clt:-

- Confusion
- Visual disturbance
- ~~Brady~~ Bradycardia $\bar{c}$ Hypertension

DOC:- FUROSEMIDE

* for Non-Responding pt. :- fluid of choice:- 3% Saline @ Hypertonic Saline

(2) TUVP :- Trans Urethral Incision of Prostate

indicaⁿ

- Size of prostate:- upto 20gm
- Two Incision given @ 5 'o' clock & 7 'o' clock

- Name ~~Knife~~ :- Collins ~~Knife~~ Knife

① Impotence

② Incontinence

③ Retrograde ejaculation?

③ open Prostatectomy:-

1) > 75gm

2) Bladder pathology:- Bladder stone & Diverticula

- Frazer's Suprapubic prostatectomy → is preferred for Bladder pathologies

- Millin's Retropubic

- Young's Perineal

- Not done now

Q:- for BPH & Renal stone laser is used:-

① ND-YAG

② HD-YAG ✓

Ca. Prostate

- Adeno. Ca.

- Non specific Marker:- CEA

- High Socio-Economic status.

- Age:- 7th / 8th decade

Only 2 Malignancy @ 7th / 8th decade
↳ Ca. prostate
Anaplastic Ca. of thyroid

Rif:- ① Advancing Age

② High fat intake

- L - Lycopene
 E - Vit. E
 S - Selenium
 A - Vit. A

* MC genetic alteraⁿ in Co. Prostate:- Hyper Methylaⁿ of GSTP-1 located on ch. 11

GSTP:- Glutathione transferase promoter Region-1.

Pathology:-

* Malignant prostatic Gland:- Small, crowded, lack branching & Absence of Basal layer (diagnostic)

* MC site:- peripheral zone - 75%
 Transitional:- 15%
 Central:- 10%

* Symptom C/H:- Mostly are asymptomatic in initial stage

- Symptom are seen in pt. having advanced D's.
- MC site of Met:- Bone (Lumbar Vertebra)
- MC Route of spread:- Hematogenous.
- MC It lead to osteoblastic 2°
- MC LN involved → Pelvic
 ↓
 Obturator

Loc:- ~~TRUS~~ ~~TRUS~~ TRUS Guided Bx
 Transrectal USG

Loc for staging:- MRI

Rx:- 1. obsⁿ + follow up
 1b, 1c, 1d ← age > 70 Yrs
 2 ← age < 70 Yrs

Radical prostatectomy > Radiotherapy.

*) BIC Orchiectomy + Flutamide

*) LHRH agonist + flutamide

↳ Goserelin - Recently ~~app~~ FDA approved for advanced & Metastatic Ca. prostate

*) Leuporelide

*) Drug used for Castera? Resistant Metastatic Ca. Prostate:-

*) CABAZITAXEL ~~prostatectomy~~ not possible to do orchiectomy.

*) SIPULEUCEL (DNB)

*) GLEASON GRADE $\begin{cases} 1^{\circ} \text{ grade (1-5)} \\ 2^{\circ} \text{ grade (1-5)} \end{cases}$ $\rightarrow$ grading pattern of ^{Most} commonly observed histological pattern of Mc observed histological pattern

*) Gleason Score :- $\rightarrow$ Sum of $1^{\circ} + 2^{\circ}$ grade
 $\rightarrow$ It is 2-10

*) PSA :- $< 4 \text{ ng/ml}$ (N)

$> 4 \text{ ng/ml}$ - At risk prostate Ca.

*) PSA density :- $\frac{\text{PSA}}{\text{prostate Volume}} \Rightarrow > 0.5 \rightarrow$ do Bx

*) PSA velocity :- Best At risk $\rightarrow$ Rate of change of PSA over period of time

$\rightarrow > 0.75 \text{ ng/ml / Year}$

$\rightarrow$ this At risk.

*) Mc organism responsible for Ac. bacterial prostatitis :- E. coli

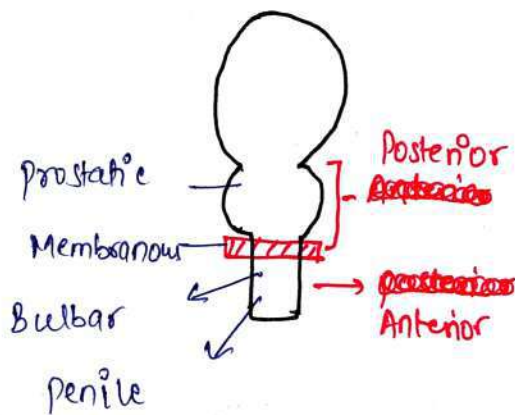
PENIS & URETHRA

① anat. of Urethra:-

② length in ♂ :- 20cm

♀ :- 4cm.

* parts of Urethra:-



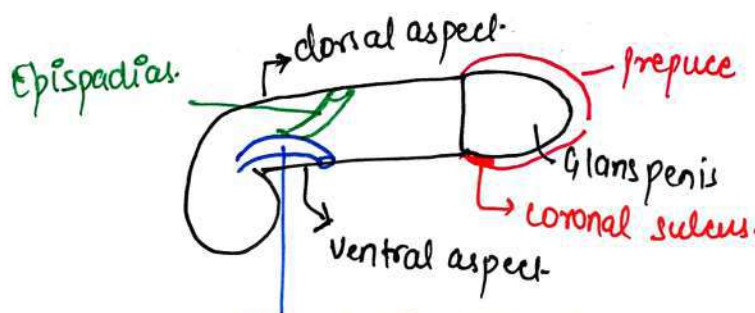
* Prostatic is widest and Most Dilatable part.

* Shortest, Narrowest, least dilatable :- Membranous.

* Longest Urethra :- penile

* Narrowest part :- Membranous (meatus if given in the option)

* Anatomy of Penis:-



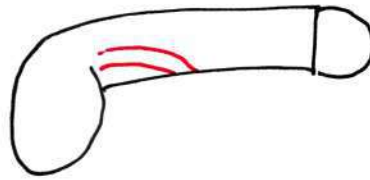
Hypospadias. (Meatus open over ventral aspect)

HYPOSPADIAS:-

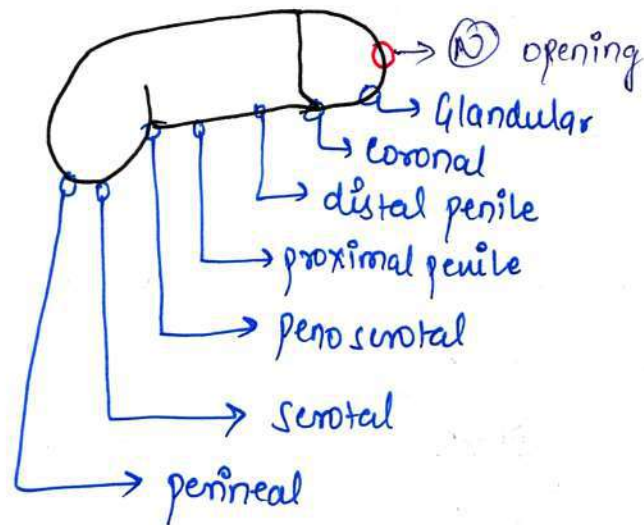
1) Incidence :- 1% & 50 congenital

2) MC abnormality of urethra

3) It's characterized by opening of Meatus over ventral aspect.

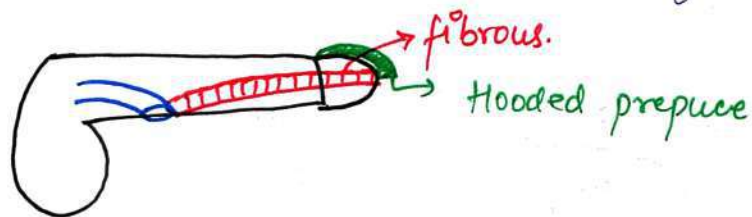


Type 4 :-



* Urethral fold closure occurs from posterior to anterior direction that's why Anterior form (MC)

* Distal penile and coronal are responsible for 40% of case.



* Associaⁿ

① Hooded prepuce :- Over dorsal aspect.

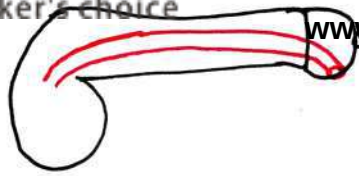
② Ventral Cordee

③ Ectopic Meatus.

④ Meatal stenosis

⑤ Microphallus :- (Short length of penis)

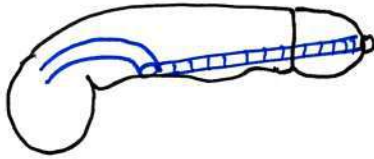
⑥ Flattened glans penis.



www.FirstRanker.com

www.FirstRanker.com

in Glandular type



Clf: in Anterior type:-

① Ab ② Stream

posterior type:-

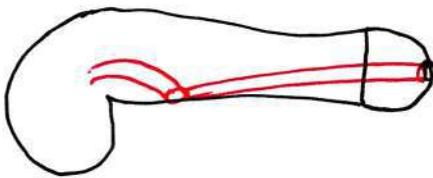
① Impotence

② Infertility

③ painful erecⁿ

*) Best age for Repair:- 6-12 months

Sx:-



MAGPI:- Meatal Advancement- Glandulo Plasty Integrated.

DNB

*) Various type of Repair:-

① Dennis - Brown

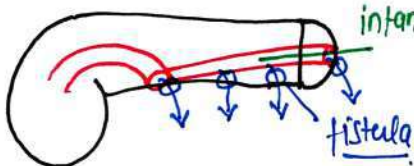
② Thiersch - Duplay

③ Bracka's

④ Mathiew's

⑤ Asopa - Duckett. (Indian)

*)

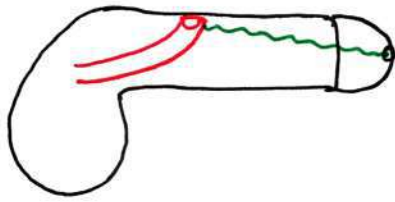


infant feeding tube

*) MC complicaⁿ of Repair:-

Urethral fistula (10% cases)

1) opening of meatus over dorsal aspect of penis



1) It's also DORSAL CORD (P41)

1) In ♀ :-



clitoris



fissure / cleft in urethra
↓
open / +ve above the clitoris.

* In Males :- Ectopia Vesicae = Undescended testis = Shallow scrotum.

* In female :- Ectopia Vesicae = Widely separated labia = Bifid clitoris.

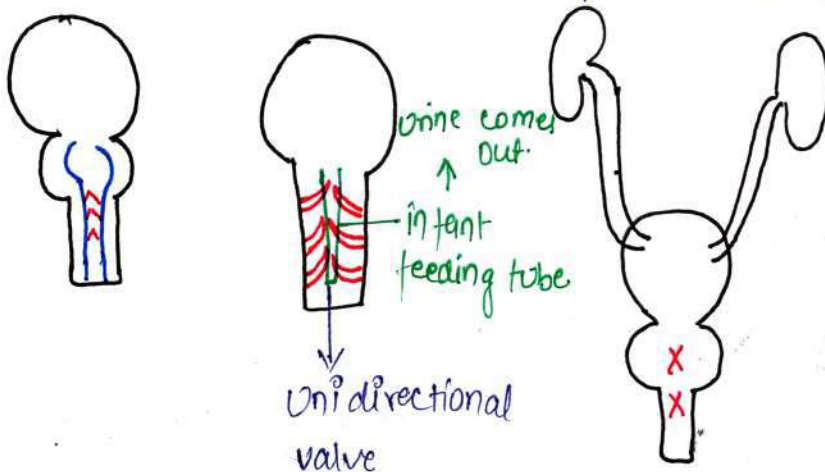
1) In female :- also incontinence.

- R:-
- ① Epispadias Repair
 - ② Correcⁿ of incontinence.

③ POSTERIOR URETHRAL VALVE:-

1) It's an Exclusively abn of Male Urethra

1) Mc type :- Type I. (located just below or @ Vermilionum.)



① In 750% pt. it's also VUR

⊗ Other assocⁿ:-

- ① Oligohydramnios.
- ② Pulmonary hypoplasia $\Rightarrow$ MCC of death.
- ③ Bladder dysfuncⁿ
- ④ Renal parenchymal dysplasia.

Clf :- Most pts are symptomatic

- 1) $\uparrow$ Urea, $\uparrow$ creatinine.
- 2) B/L palpable intraabdominal Mass.
- 3) palpable Bladder

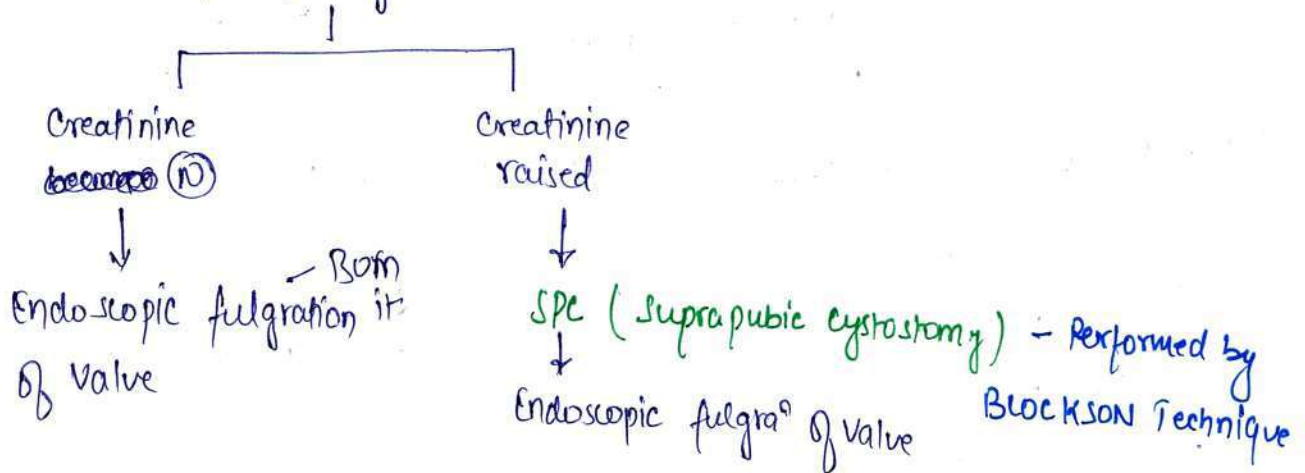
Die of Ascitis :- Urinary Ascitis.

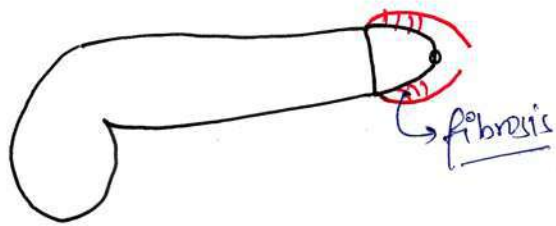
USG :- B/L Hydro Uretero Nephrosis.

- 1) Distended Bladder
- 2) Urinary Ascitis.

Doc :- MCU.

R :- Insert infant feeding tube



PHIMOSIS

1) Prepuce cannot be Retracted Back Over glans penis.

2) Mcc:- Ch. infecⁿ $\xrightarrow{\text{JAT}}$ Poor Hygiene

3) Other cause:- ① Congenital

② Acquired:-

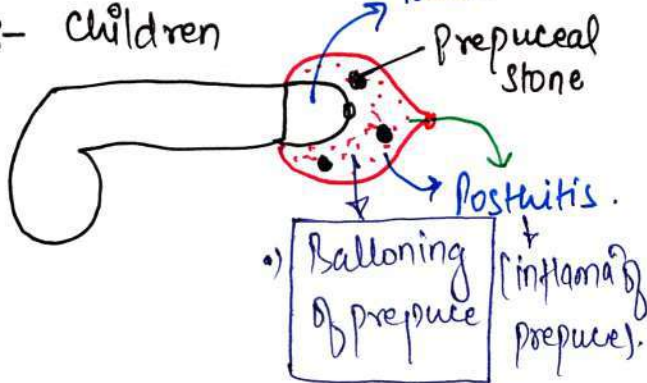
① Trauma.

② Ca. penis.

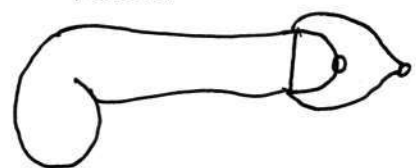
③ Infecⁿ Balanitis (inflamaⁿ of Glans)

Problem/c/o

:- Children



Adult.



1) Difficulty in Intercourse

Complicaⁿ:-

① Prepuceal stone

② Balanitis

③ Posthitis

④ Ca. Penis

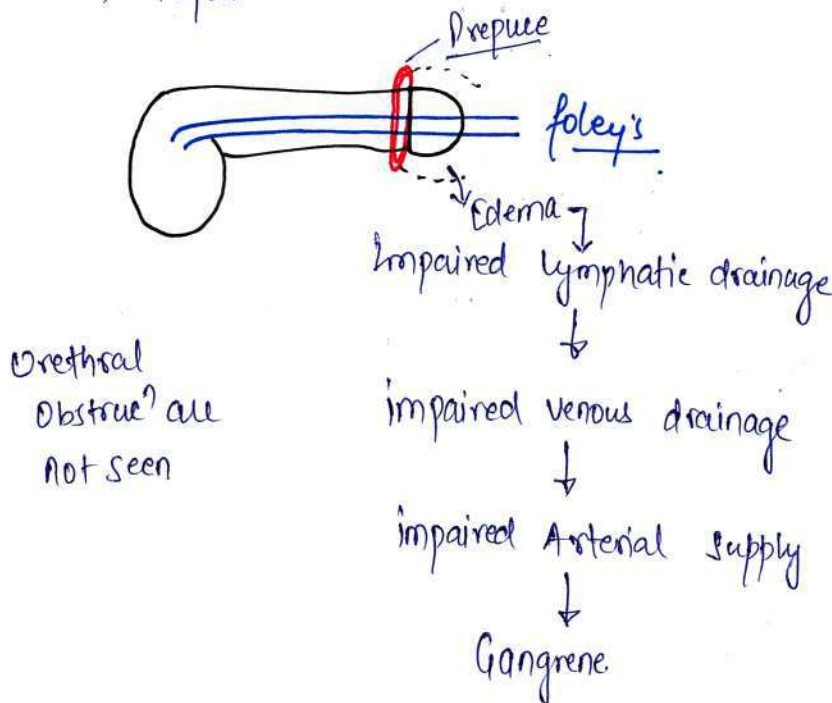
Rx:- Steroidal Cream applicⁿ for 4-6 Wks.

↓
lysed the Adhesion.

- ① No improvement after steroidal cream applicaⁿ
- ② Recurrent infecⁿ
- ③ Age of pt :- 16-18 Yr

PARAPHIMOSIS

→ Acquired.



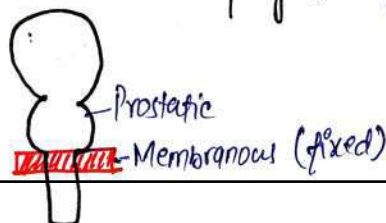
Rx :- Mostly Conservative by Pee bag applicaⁿ and Hyaluronidase injecⁿ
 → In severe case :- Circumcision is performed.

URETHRAL INJURY

2 type :-

- ① Posterior Urethral injury (MC)
- ② Anterior " "

* Post-Urethral Injury :- ① MC injured part of Urethra :- Membranous Urethra
 → In membranous Urethra :- Bulbomembranous & prostatic membranous



*) It's also Extra peritoneal Bladder Rupture.

*) Characteristic feature:

① Urinary Reteⁿ + pelvic Hematoma + Blood @ Meatus.

*) On IVP:- Rupture @ prostatic membranous junction & High line prostate

↓
PIE ON SKT APPEARANCE

IUP →



Rx:- Suprapubic Catheterizaⁿ if delayed Repair

*) Emergency Repair should not be attempted just to avoid:-

- ① Urethral stricture
- ② Impotence
- ③ Incontinence

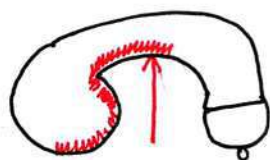
ANTERIOR URETHRAL INJURY



Bulbar - MC injured part
penile

Cause:- ① Straddle injury (Man hole injury)

② External Blow @ Kick to Urethra.



Butterfly Hematoma

Characterized by:-

- ① Urinary Reteⁿ
- + Blood @ Meatus
- + Superficial perineal Hematoma

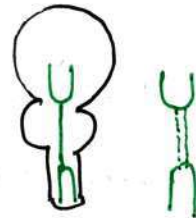
Rx: Supra pubic catheterizaⁿ f/b delayed Repair.

Q for post-urethral ~~injury~~ stricture :- Doc:- MCV

Q onto n n :- Doc:- RGV (Retrograde Urethrogram)

Q Adequate evaluaⁿ of any Urethral Stricture :- Doc RGV + MCV

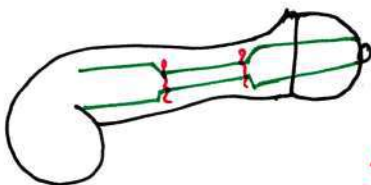
- ① RGV
- ② MCV
- ③ Both
- ④ None



Rx: ① Urethral Dilataⁿ

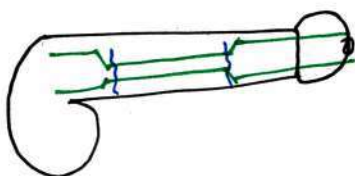
② Optical Internal Urethrotomy :- performed for Short Bulbar stricture @ 12'o clock posiⁿ

③



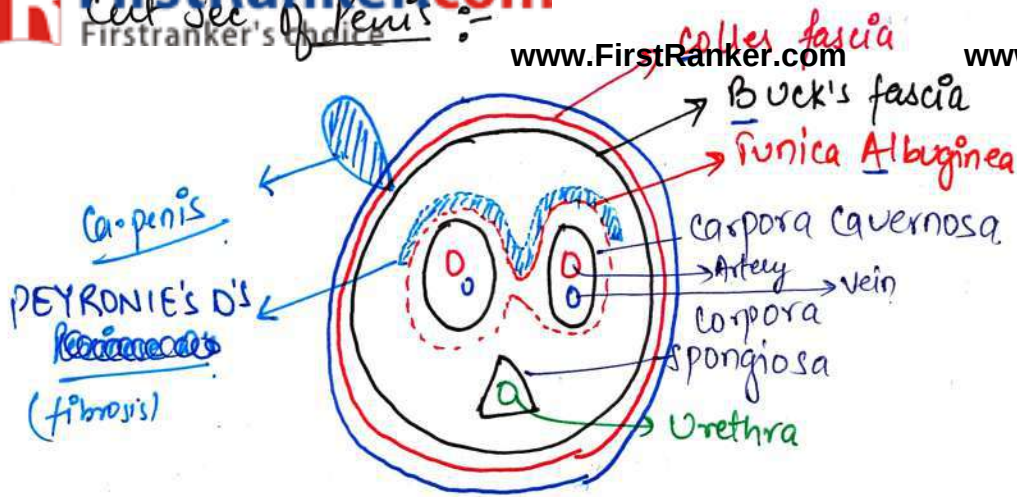
Stricture
* Upto 2cm :-
Excision & Reanastomosis

#



* > 2cm :-
Excision & Reconstructⁿ of Urethra

Most preferred tissue :- Buccal Mucosa > Bladder Mucosa
> Penile Skin



* In Ca. penis :- Tunica Albuginea and Buck's fascia act as strong barrier prevent involvement of vessels. That's why incidence of pulmonary metastasis is rare in pt. of Ca. penis.

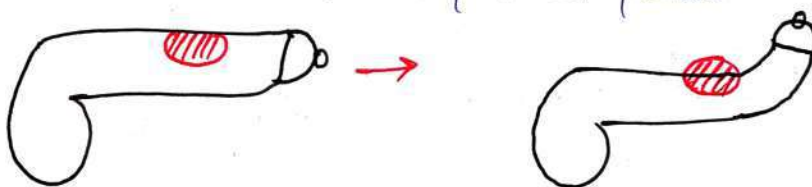
⊗ PEYRONIE'S D'S

~~Penile fibromatosis~~ :- aka. Penile fibromatosis.

1) It is characterized by chr. Vasculitis & Involvement of Tunica Albuginea.

2) There is +ve of fibrous plaque around Dorso-lateral Aspect of penis.

Galeazzi's D :-
 D :- Dupuytren's Contracture
 P :- Peyronie's D's
 R :- Retroperitoneal fibrosis.



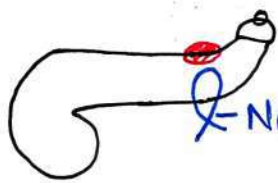
1) It is 'painful Erect'

poor Erection distal to fibrosis

Curvature in penis on Erect & Impotence and Infertility

* Spontaneous Resolution occurs > 50% of pt.

Sx:-



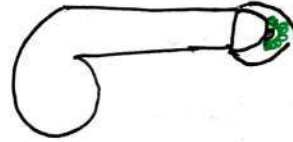
NESBIT OPERAN :-

Used for straightening of penis by taking non-absorbable suture opposite to fibrosis.

CA. PENIS

- MC type:- Sq. cell Ca.
- 5th/6th decade
- But 40% pt. < 40 Yr of age
- >10% pt. it is also phimosis.
- Neonatal Circumcision is protected :-
 - ① Ca. penis.
 - ② HIV
 - ③ STD.
- HPV (16, 18, 31, 33)
- Premalignant lesion:-
 - ① Bushke - lowenstein T. (Verrucous Ca.)
 - ② BXO:- Balanitis Xerotica obliterans
 - ③ Warts
 - ④ Cutaneous Horn
 - ⑤ Leukoplakia (White patch on Glans)
- * Ca. In-situ of Penis
 - ① Bowen's D's
 - ② Erythroplasia of Queyret :- Ca. insitu. of glans

- 2nd MC n° - prepuce (G > P > C)
- 3rd MC - Suleus



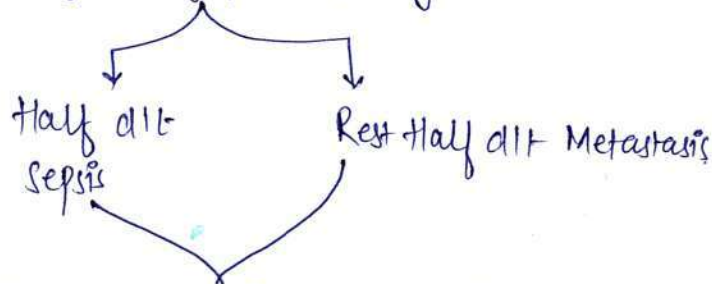
* MC presentaⁿ:- lesion it self $\bar{c}$ foul smelling discharge

→ No pain (or) Minimal pain.

→ >50% also $\bar{c}$ ~~phimosis~~ phimosis.

* Acc of deaths

Inguinal Lymphadenopathy $\bar{c}$ >50%



→ That's why Routinely Antibiotic given for the pt of Inguinal LNopathy for 4-6 wks.

* MC of Death:- ~~Local~~ Bleeding caused by Erosion of femoral vessels.

* 2nd MC of death:- Sepsis.

* Pulmonary Metastasis are rare

* MC Route of spread - Hematogenous

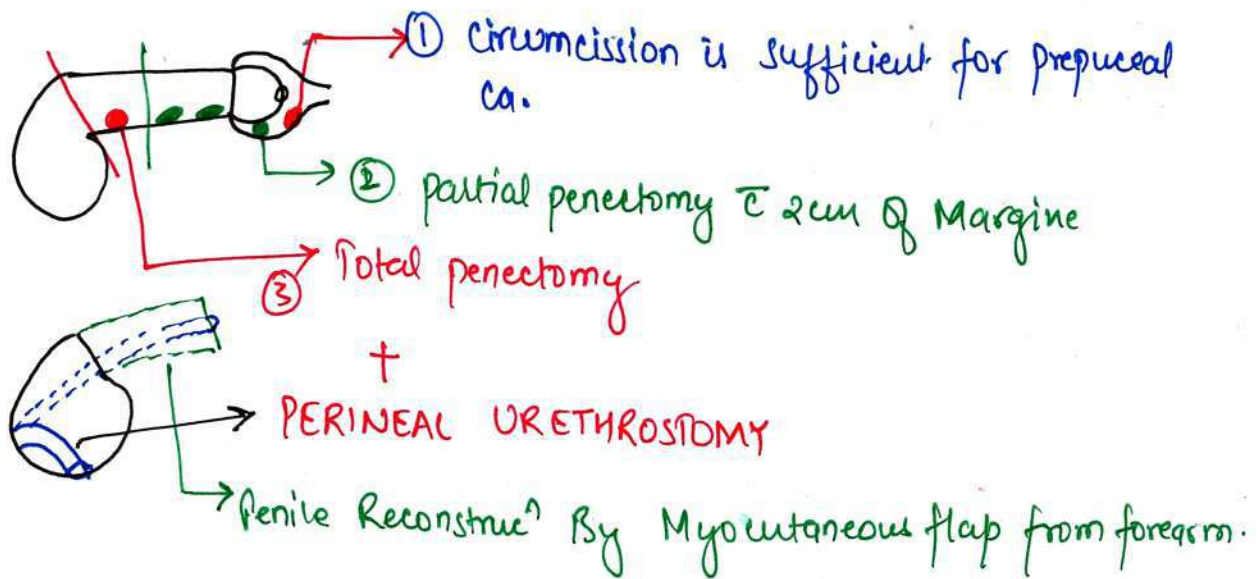
* Loc :- Biopsy

* Sentinel LN Bx :- Established Role

- ① Breast Ca.
- ② Malignant Melanoma
- ③ Ca. Penis

Penile LN Bx in Ca. Penis:- Cabana Procedure

* Loc for staging of Ca. Penis:- MRI.



④ LHRH agonist:- GOSEROLIN
(for Sexual frustraⁿ) LEVPEROLIDE

* Chemotherapy

① Adeno. Ca. :- 5-FU

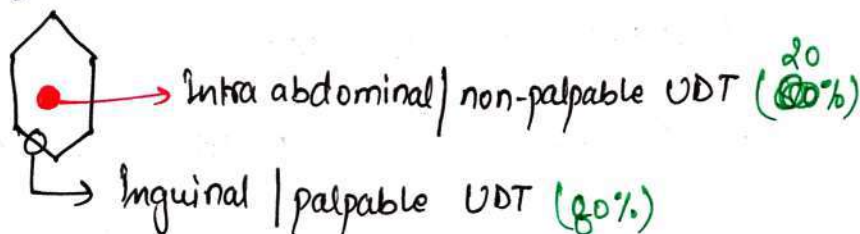
② Sq. cell Ca. :- Cisplatin.

⇒ Chemotherapy Agent used:- Cisplatin / Bleomycin.
for penis Ca.

Undescended Testis

- 1) Incidence @ the time of Birth :- 3%
- 2) Incidence @ 1 Yr of Age :- 1%
- 3) Spontaneous Descent occurs in :- 40-44% by 3 months of Age
- 4) R/f :-
 - (i) prematurity
 - (ii) LBW
 } Two independent R/f

2 type of UDT



2) Histopathological changes in UDT:-

- (1) Hypoplasia of Leydig cell (∵ it is less sensitive to temp) :- Earliest Histopath. abnormality
- (2) Delayed disappearance of Gonocyte.
- (3) Delayed appearance of primary spermatocyte
- (4) Degeneraⁿ of Leydig cell and Sertoli cell.

* Leydig cells keeps on producing Testosterone



∴ Sexual character are +ve even in Bile undescended of testis

* Complete absence of spermatogenesis occurs by 5-6 Yr of age in UDT.

Complications of UDT:-

- S :- Sterility
 - A :- Atrophy
 - T :- Trauma, Tumor Torsion
 - H :- Hernia
 - I :- Inflammation
- Seminoma → MC Malignancy in UDT

- * Orchidopexy facilitate Early diagnosis but it doesn't ↓ the Risk of Testicular Tu.
- * RoC :- Inguinal Exploration.
- * RoC for non-palpable ^{UD} testis :- Diagnostic laparoscopy
(Intra abdominal)
- * During Astic laparoscopy follow vas and testicular artery.
- * If vas is Blind → No Testis May ^{or} May not be +ve
- * If Testicular artery is Blind → Testicular Agenesis
- * Best Age for Orchidopexy → 6 month. (6-12 month)
- * Q :- Age :- 7m ✓ 9m ✓ 14r ✓
 8m 10 " 24r
 9m 11 " 34r
 10m 12 " 44r
- Types of Orchidopexy:-
 - ① OMBRIDANNES
 - ② LADD & GROSS
 - ③ KEETLEY TOREK
 - ④ STEPHEN POWERS
 - ⑤ PLACING TESTES IN DARTOUS POUCH
 - ⑥ MICROVASCULAR TESTICULAR AUTO-TRANSPLANTATION :- Best

Testicular Tu.

- R/f:
- ① Cryptorchidism (undescended testis)
 - ② No testicular Tu. in siblings.
 - ③ personal history of testicular Tu.
 - ④ Testicular feminisation Synd.
 - ⑤ Klinefelter Synd.
 - ⑥ In-~~tero~~ utero Exposure of DES (Diethylstilbestrol)

* WHO classification of testicular Tu:-

① Germ Cell Tumor :-

① Seminoma

② Non-Seminomatous Germ cell Tu.

- Yolk sac Tu.
- Embryonal Car.
- Teratoma.
- Chorioc.

③ Sex Cord / Gonadal Stromal Tu:-

- Leydig cell Tu.
- Sertoli cell Tu.
- Granulosa cell Tu.
- Thecoma
- fibroma.

④ Mixed Tu (Germ cell + Gonadal Stromal component)

- Gonadoblastoma.

④ Hematopoietic Tu:-

- Lymphoma
- Leukemia
- Plasmacytoma

⑤ Miscellaneous:-

- Adenoma
- Carcinoma
- Carcinoid

* Cynecomastia is +ve in the Tu. having Gonadal Stromal Component:-

eg:- Leydig cell Tu.

Sertoli cell

Granulosa cell Tu.

Theroma

Fibroma

Gonadoblastoma.

* MC type of Testicular Tu:- Seminoma (Mixed if given in the option)

* Most Radiosensitive Testicular Tu:- Seminoma.

* MC 1° Bile Testicular Tu:- Seminoma.

* MC Testicular Tu. in children (Age 1 to 3 yr):- Yolk Sac Tu.

* Testicular Tu. with Best prognosis :- Yolk Sac Tu.

* MC Testicular Tu. in Pre-pubertal children:- Teratoma
(Age 11-13 yr)

* MC Testicular Tu. in Elderly :- Lymphoma.

* MC 2° Testicular Tu :- Lymphoma.

1) MC type of lymphoma in testis:- NHL (DLBL)

2) Testicular is having ~~the~~ Early Hematogenous Spread, Early pulmonary Met, having worst prognosis:- Choriocarcinoma.

⇒ Most Extra-Nodal lymphoma are:- NHL

1) Most common type of NHL:- DLBL

DLBL is MC type of lymphoma in:-

① 1° CNS lymphoma

AIMS ② Orbital lymphoma

③ thyroid lymphoma

④ Breast lymphoma

⑤ Gastric lymphoma [in 52% cases - DLBL + B Maltoma (35%)]

⑥ Small Intestinal lymphoma

DMB ⑦ Appendicular lymphoma

⑧ Colonic lymphoma

⑨ Rectal lymphoma

⑩ Testicular lymphoma

Concept: Regarding Age of Malignancy Most of Malignancy of Adult seen in 5th/6th decade

① 7th/8th decade:- ① Ca-prostate

② Anaplastic Ca. of thyroid.

③ 6th/7th decade:- ① Ca-pancreas

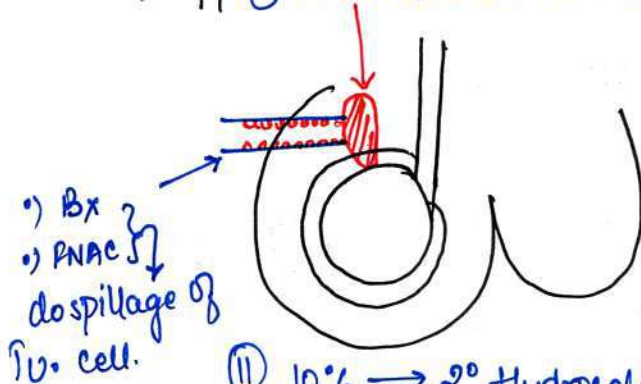
② Ca-Q.B.

* Testicular Tumor

1) MC type of Testicular Tumor: Seminoma,

2) 3rd/4th decade

3) C/f: ① Mass in Relatⁿ to Testis



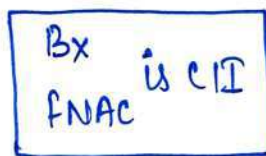
② 10% → 2° Hydrocele

③ 5% → Gynecomastia.

4) O/E: 1) palpable Mass. in Relation to testis.

2) Testis is Enlarged and Hard,

5) Doc: USG



Contraindica?

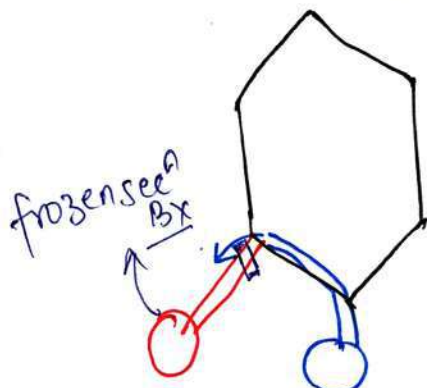
to prevent Seeding of Tumor cell

* USG finding - Hypoechoic Mass

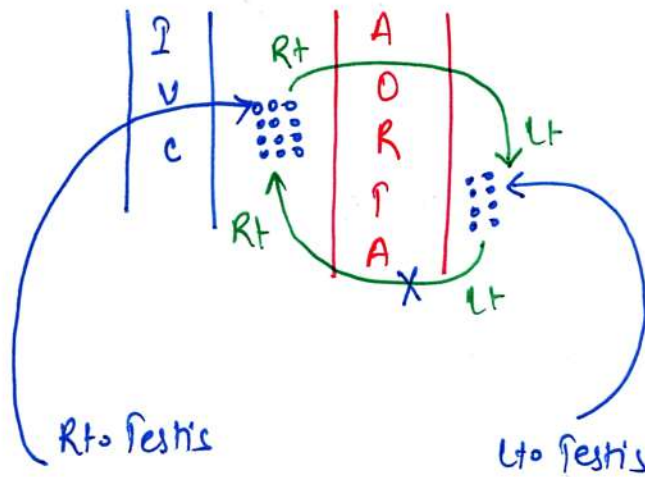
- 2° Hydrocele

* CHEVASSU MANEUVER :-

taking frozen secⁿ Bx from Testicular Tumor
after applicaⁿ of Soft Clamp



1) In case of Malignant Tumor: High Inguinal
Orchiectomy is performed



Q: 1^o landing site from Rt. Testicular TV: Enter Aorticaval group of LN

Q: 1^o landing site from Lt. Testicular TV: Para Aortic LN

Q: Cross Over Metastasis Occurs from Rt. to Lt.

Q: No cross Over Metastasis from Lt. to Rt.

Q: Ultimately MC involved LN group in Testicular TV: Para Aortic LN

→ TV Marker :-

* In which TV. ALPHA FETOPROTEIN ↑:-

Y :- Yolk Sac TV.

E :- Embryonal Ca.

T :- Teratoma.

* BHCG ↑ in :-

C :- Chorio Ca

E :- Embryonal Ca

S :- Seminoma

- Marker C are based on Bulk of D's:-

① LDH - Lactate dehydrogenase

② PLAP :- Placental alkaline phosphatase

③ GGT :- Gamma Glutamyl Transpeptidase.

* Marker for Seminoma.

① AFP

② β -HCG

③ LDH

④ PLAP. ✓

* β -HCG product is the property of chorion. It is produced by syncytiotrophoblast

* Only 10% pt. having Seminoma are also raised β HCG. due to presence of syncytiotrophoblast

* Testicular Tu:- TNM classification?

→ Serum Marker

Serum Marker:-

① α -FP

② β HCG

③ LDH

* MC Route of spread:- Hematogenous.

* MC site of Mets:- Lung

R:-

Seminomatous

① IA IB
IIA IIB } Radiotherapy

② IC, IIC → CHEMOTHERAPY

⑤ Serum marker

→ B - Bleomycin

E - Etoposide

P - CISPLATIN

× 6 Cycle

Non-Seminomatous.

① RPLND (Retro peritoneal LN dissec)

② CHEMOTHERAPY
+/- RPLND.

- *) MC Histological type:- Sq. cell Ca.
- *) Low Socio. Economic Status.
- *) AKA CHIMNEY SWEEPS CANCER
- *) Rf:- Exposure of Hydrocarbon, TAR, SOOT
- *) presentation:- MC:- Ulcer w/ indurated Base & Everted Edges



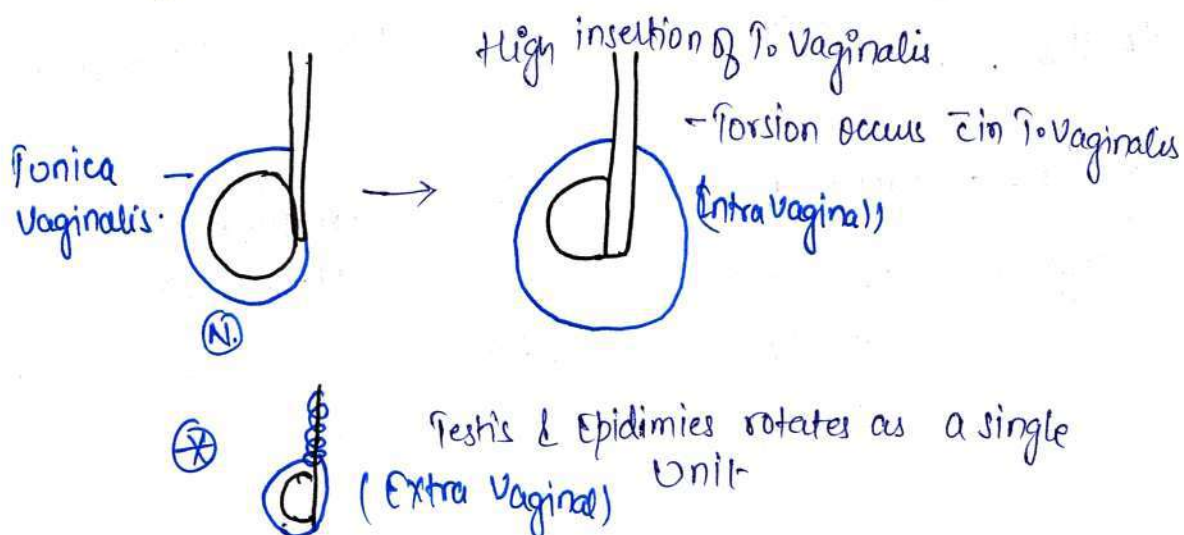
- *) MC group of LN involved:- Inguinal
- *) Doc:- Bx
- *) Doc:- Wide local excision w/ 2cm Margin.

Benign Condiⁿ

TESTICULAR TORSION

2 type:-

- ① Intra Vaginal (MC)
- ② Extra Vaginal



- Pre-pubertal children
- Young adult (10-25yr)

Predisposing factor:-

- ① Inversion of Testis - MC
- ② Bell-Clapper's deformity aka High Investment of P. Vaginalis.
- ③ Spiral attachment of Cremasteric fibre over the cord.

CI:- It's also severe agonising pain

also N&V.

OIE • Testis → High Riding located in upper part of scrotum.

• Prehn's sign:- -ve

• Cremasteric Reflex:- -rt

• Angle sign :- contralateral testis is (N) lying in transverse orientat

• Deming Sign:- affected testis is High Riding (OR) located in upper part of scrotum

* Orchidopexy slb performed in 4hr @

* RoC:- Doppler :- Doppler for to see the flow.

① Portal HTN

② Varicose vein

③ DVT

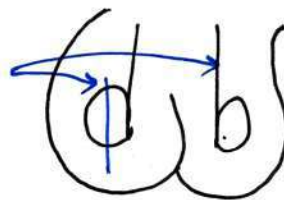
④ Varicocele

⑤ Testicular Torsion

* RoC:- Orchidopexy

→ during Orchidopexy:- explore CIL Hemiscrotum in

case of BELL-Clapper's deformity:- Bil Orchidopexy slb perform



Extra-vaginal IT.

Pre-natal

- Occurs during pregnancy
- Non-Viable Testis
- Locⁿ Inguinal Canal
- Hard
- Rx: Orchidectomy

Post-Natal

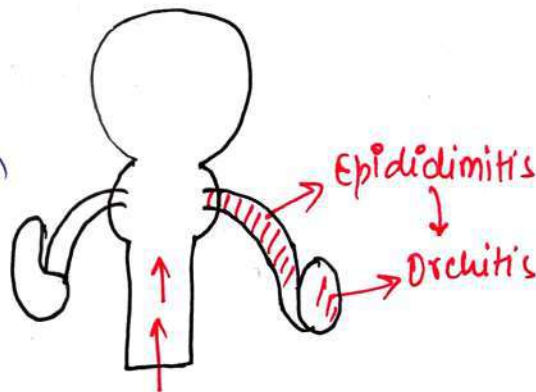
- Occurs after Birth
- Testis is Viable
- Rx: Orchidopexy

⊗ Acute - Epididymo - Orchitis:-

Pathway of infect:-

Cause

- Ascending Bact. infectⁿ
- Ble of:-
- (i) UTI
- (ii) STD



- * MC Organism responsible for Ac. Epididymo - Orchitis in
- (UTI) children
 - (UTI) Elderly
 - (Homosexual) Homosexual
- } E. Coli

- * MC org. responsible for Ac Epididymo. Orchitis in Sexually Active Male:- CHLAMYDIA

- Diff: ^{1st choice} ^{1st} ^{1st}
- ① low Grade fever
 - ② pain in Inguino-Scrotal Region

OIF: ^{1st} PREHEN'S SIGN: +ve ^{1st} Cord is thickend.

^{1st} CRIMASTRIC REFLEX: +ve

POC: USG. → additional +ve of 2° hydrocele

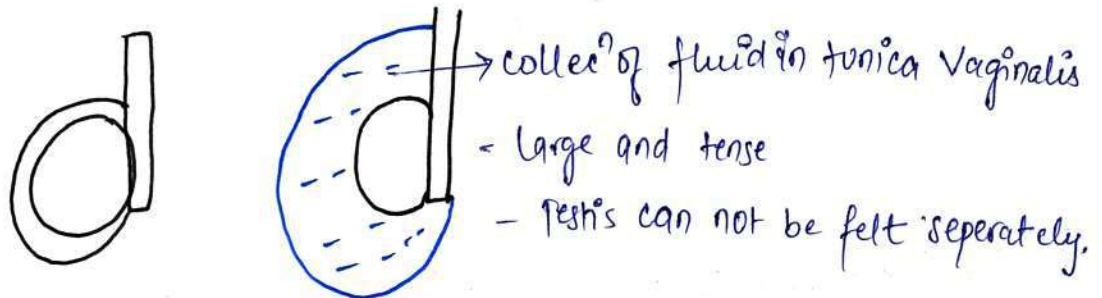
Prehen's sign +ve
↓
On Elevatⁿ of inflamed testis
pain disappear

Q: Mcc of 2° hydrocele World wide + Ac Epididymo orchitis.

Rx: NSAID + Antibiotic.

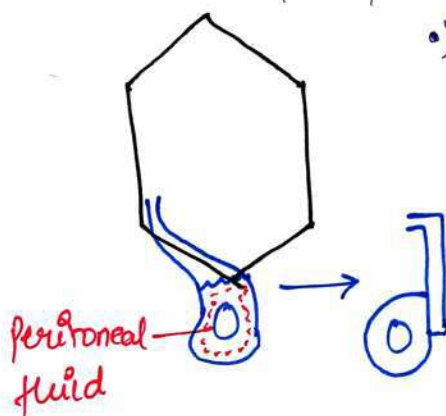
⊗ PRIMARY: HYDROCELE

① MC type: Vaginal Hydrocele



② Congenital Hydrocele:

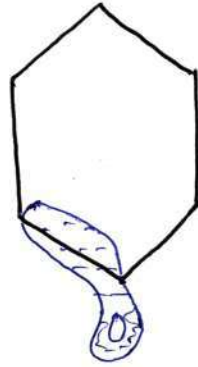
Testis develop from post-abdo wall.



① Congenital Hydrocele characterised by:-

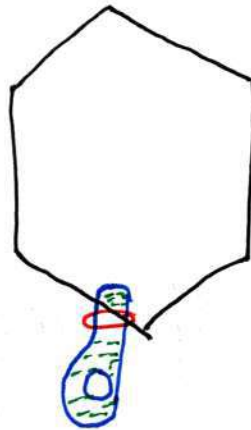
- patent processus vaginalis
- Cough impulse +ve
- Spontaneous Resoluⁿ occur by 2nd yr b/c obliteration of patent processus vaginalis

Rx: Herniotomy.



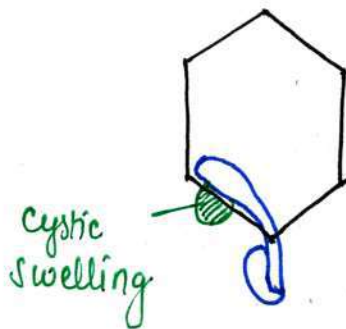
- Characterized patent processus vaginalis upto Inguinal Canal.
- It doesn't communicate $\bar{c}$ Peritoneal Cavity
 - cough impulse absent.

④ Bilocular Hydrocele / Hydrocele En-Bisac.



- Two sac communicating $\bar{c}$ each other near Neck of scrotum

⑤ Hydrocele of Cord:- cystic swelling in the Remnant of processus Vaginalis in Relation to Cord.

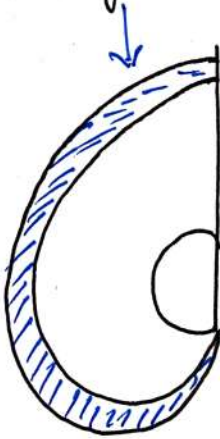


cystic swelling

- MCC :- Epididymo-Orchitis
- Trauma
- Testicular To.

R of Hydrocele :-

- ① Small :- LORD'S PPLICATION OF SAC
- ② Medium :- Jaboulay's Eversion of sac.
- ③ Large :- Excision of sac

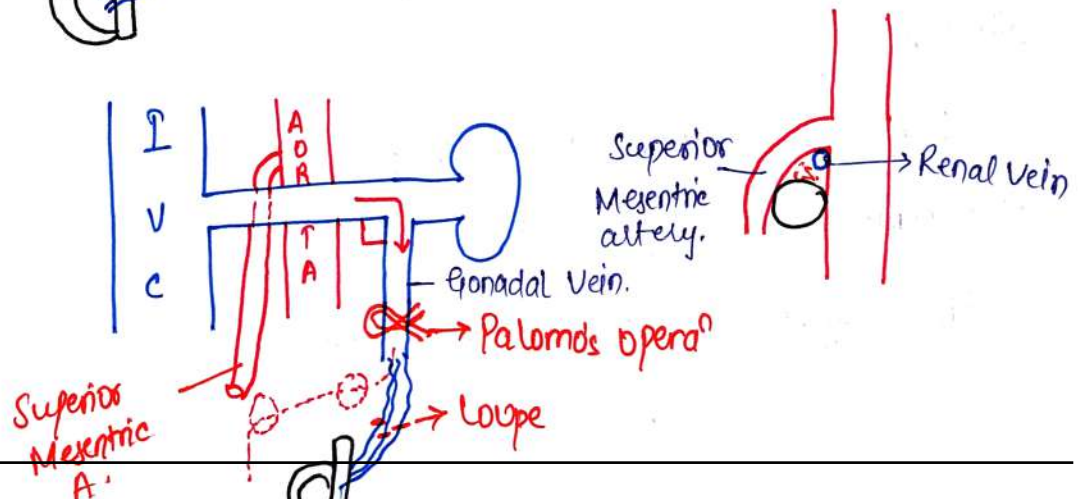


VARICOCELE

- Dilated Tortous pampiniform plexus of vein
- Locaⁿ :- Posterior and Above Testis.

- MC on (L) Side

- It causes Reversible Atrophy of testis in Adolescent Male



Hypothesis
&
factor

① Nutcracker phenomenon :- Compression of Lt Renal Vein b/w Aorta and Superior Mesenteric artery

② Loaded Sigmoid colon compresses Lt. Gonadal vein.

Clf:- ① Mostly asymptomatic

→ In symptomatic pt:- dyscomfort

*) BAG OF WORM like sensⁿ on palpaⁿ
more prominent in up-right posture,
decompresses on lying down posiⁿ

*) Most severely affect parameter of Semen Analysis:-

① Motility

② Number.

*) IDC:- Doppler.

*) Gold std :- VENOGRAPHY

*) Indicaⁿ of Rx:-

① Dyscomfort.

② poor testicular growth

③ Infertility

④ ↓ motility & number on Semen Analysis.

⑤ Recruitment in Army and Police Services.

Rx:- ① High Inguinal Ligaⁿ of pumpiniform plexus of vein.

- ② Palomo's operaⁿ:- Retroperitoneal ligaⁿ of α to Gonadal Vein.
- ③ Micro Vascular Subinguinal ligaⁿ of Pampiniform Plexus of Vein.- Best Result.

ARTERIAL DISEASE* ARTERIAL OCCLUSION :-

Characterised by 5 P's :-

- (i) pain (Mc)
- (ii) pallor
- (iii) pulsesless
- (iv) Paralysis
- (v) Paraesthesia

*) Mec of Arterial occlusion :- Atherosclerosis.

*) Cause of AO in Male, <40, Smokers :- BUERGER'S.

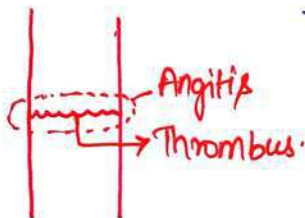
BUERGER'S (TAO)

- Ch. vasculitis & skip lesion
- Male, smokers & <40yr
- Small & Medium size vessels.
- Vessels involved are :-

T :- Tibial

P :- Plantar

R :- Radial.



- Inflammatory process involve 3 structures :-

- 1) Artery
- 2) Vein
- 3) Nerve

- Triad :- Mn :- R + I + M

- (i) Raynaud's phenomenon
- (ii) Intermittent claudication
- (iii) Migratory superficial thrombophlebitis.

Grade I :- pain appears @ the start of walk but disappears if pt. continue to walk.

Grade II :- pt. can walk w^o pain

III :- pain compels the pt. to take Rest.

IV :- Rest pain.

→ Ankle-Brachial Index :- Ratio of BP at Ankle joint and Brachial artery.

0.1 - 0.4 :- CLI (Critical Limb Ischemia)

0.5 - 0.9 :- Intermittent claudicaⁿ

1 - 1.2 :- (N)

> 1.2 :- Calcified Vessels :- cause :-

(i) DM

(ii) ESRD.

* FONTAIN'S STAGING OF LIMB ISCHEMIA :-

Stage I :- Asymptomatic.

IIA :- Mild Intermittent claudicaⁿ

IIB :- Moderate to severe Intermittent Claudicaⁿ

III :- Rest pain.

IV :- Critical limb Ischemia $\xrightarrow{UIT}$ ulceraⁿ & Gangrene.

* ROC :- FOUR LIMB ANGIOGRAPHY :- CORK-SCREW collateral

(in Budd chiari- Synd on venography :- spider web collateral)

Rx :- (i) Abstinence from smoking

(ii) Vasodilator :- (i) Xanthinol Nicotinate

(ii) Pentoxifylline

④ Amputaⁿ :- Gangrene

* Blood supply of m's is not under sympathetic control that's why ~~Intermittent~~ Intermittent claudicaⁿ is not an indicaⁿ of Lumbar Sympathectomy.

→ Indicaⁿ of Lumbar Sympathectomy :-

- ① Buerger's D's (Rest pain)
- ② Atherosclerosis.
- ③ Raynaud's D's
- 4) Acrocyanosis. "Mn:- BARA CHEP"
- 5) Causalgia
- 6) Hyperhidrosis
- 7) Erythrocyanosis
- 8) Frost Bite

* for Lumbar Sympathectomy :- L₁ to L₅ is removed, during Bil Lumbar Sympathectomy
@ least ① SL₆ preserved from one side to prevent Retrograde Ejaculaⁿ.

⊗ Structure damaged during Lumbar Sympathectomy :-

Mn:- G - Genito femoral Nerve

P - Psoas Sheath, Psoas Minor

L:- Lymphatic

THORACIC OUTLET SYND :-

- Misnomer :- Thoracic inlet Synd
- Characterized by :- Compression of Brachial plexus & subclavian vessels @ thoracic inlet.
- MC in Middle age ♀.
- Dynamic obstructⁿ (Not static obstructⁿ)
- Rarely diagnosed by Radiological Im

Predisposing factor:-

- (i) Cervical Rib
- (ii) fibrous band.
- (iii) Cervical Hematoma
- (iv) Pancoast Tumor
- (v) Osteoarthritis in Cervical Region.
- (vi) Long Transverse process of Cervical Vertebra.

* 2 form

- Neural form (MC):-

- Caused by compression of Brachial plexus
- MC involved Root value:- C8-T1
- MC involved Nerve:- ulnar
- It is characterised by:- Pain and Paraesthesia along inner aspect of forearm and Hand
- O/E:- Atrophy of Hypothenar M's.

- Vascular form:- 2 type:-

(1) Arterial form:- compression of sub-clavian (A).
C/O - SP's - pain, paralysis, pallor, pulselessness, paraesthesia.

(2) Venous form:- pain, Edema, Bluish discoloration

~~Provocative~~ Provocative Test:-

- (1) Adson's Test
- (2) Costoclavicular Test
- (3) Hyperabduction Test
- (4) Roos Test

(i) physiotherapy

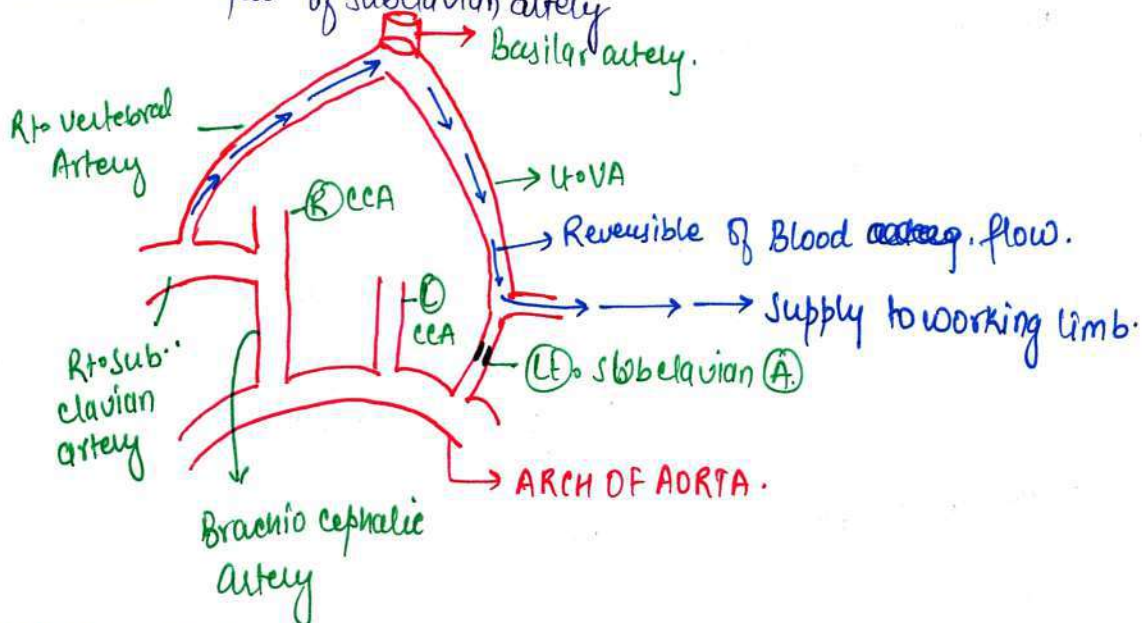
(ii) M's strengthening exercise

Indicaⁿ of Sx | Sx interveⁿ:-

- (1) NO improvement after Medical Mx
- (2) Deterioration of symptom
- (3) Vascular form
- (4) Anatomical abnormality
- (5) Abⁿ prolonged conducⁿ velocity of Median (or) ulnar Nerve :- There is significant compression of Nerve.

Subclavian Artery stenosis:-

- MCC of Subclavian (A) stenosis :- Atherosclerosis
- MC on (L) Side
- MC involve 1st part of Subclavian artery



Subclavian steal Synd:- Reversible of Blood flow in Ipsilateral Vertebral artery to supply working limb.

* In even case:- Imbalance ataxia, Visual abnormality

ANEURYSM

- 1) Mc site of Atherosclerosis :- Intra Renal Aorta.
- 2) Mc site of Extra-Cranial aneurysm :- Intra-Renal Aorta.
- 3) Mc of Most Extra-Cranial aneurysm :- Atherosclerosis.

Except :- Renal Artery Aneurysm.

eska → Mc → Medial fibroplasia > Atherosclerosis.

1) Incidence :- Aorta > Iliac artery > popliteal > femoral.

Mn :- All India Police force

Mc site of peripheral arterial aneurysm

$$8.5\text{cm} = 3.5\text{cm} + 2.0\text{cm}$$

* for Most of Medium Size Vessels cut off diameter :- 2cm.

* for Most Small Vessels cut off diameter :- 1cm.

~~***~~

* Mc Complicaⁿ of Aortic Aneurysm :- Rupture.

* Rupture mainly depends on width/diameter of Aneurysm.

* Mc Site of Aortic Aneurysm Rupture :- Lt. Retro peritoneal.

* Risk also Aortic Aneurysm Rupture :- 40-50%.

→ Mycotic Aneurysm :- Caused by focal Dilataⁿ of Vessels @ the Region or @ the site weakened by infecⁿ.

Septic Emboli

* Mc artery involved :- femoral artery > Aorta (vessel)

* Mc Organism :- Staph. Aureus > Salmonella.

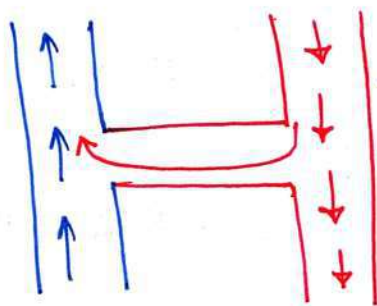
ARTERIO-VEINOUS FISTULA

1) Congenital (MC)

11) Acquired :- MCC → penetrating Trauma.

1) MC performed fistula for Hemodialysis :- Brescia-Cimino fistula
↓ created B/W

Radial artery & Cephalic Vein.



→ ↑ Venous ~~Rate~~ Return

↓

↑ CO

↓

↑ HR

↓

↑ SBP &

WIDE PULSE PRESSURE

•) palpable thrill.

•) pulsatile mass

•) In ch. case :- Vein become Dilated, Tortus, Thickened K/A Arterializaⁿ of Vein.

•) On compression of artery proximal to fistula
↓

•) Thrill disappears

•) Size of pulsatile Mass ↓

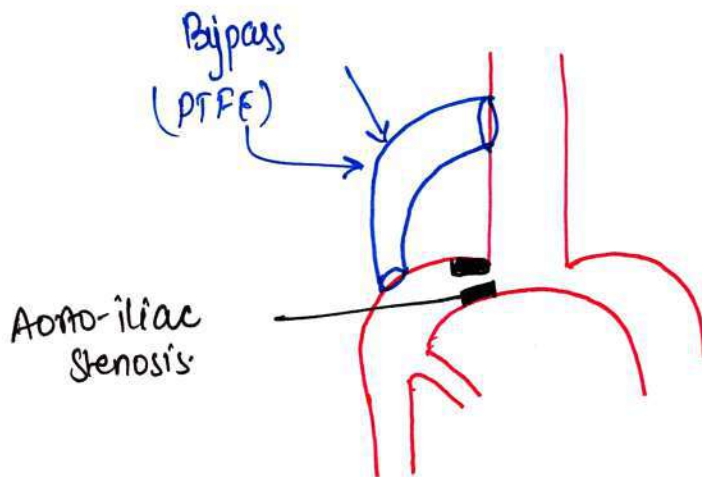
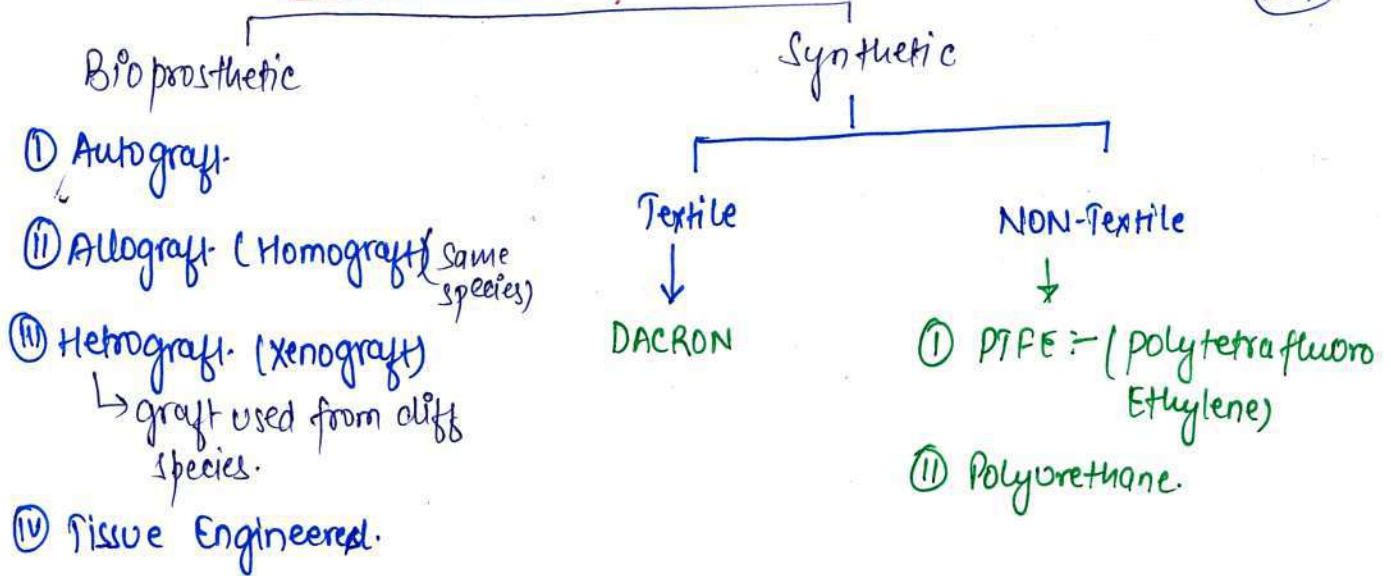
•) Bradycardia.

↓ NICOLADONI-BRANHAM'S SIGN

Ioc :- Angiography.

Rx :- Small fistula :- Angiography + Embolizaⁿ

Large fistula :- Open Surgical Ligaⁿ.



Q:- for supra inguinal Bypass:- Synthetic graft preferred.
 ↓
 MC used PTFE

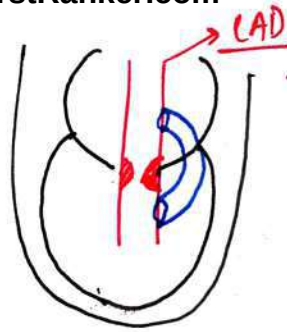
Q for Intra Inguinal Bypass:- Both PTFE & long saphenous vein.
 ↳ MC preferred :- Long saphenous.

Q Intra popliteal Bypass:- Exclusively Long saphenous vein.

Q:- In Aorto-Bi-iliac Stenosis:- claudicaⁿ occur in Gluteal Region, thigh, Calf and foot & Erectile dysfunctionⁿ KIA **LERICHE SYND^m & AIMS**

1) MC used is:- Long Saphenous Vein.

2) Most preferred:- U = Internal Mammmary artery
↳ dit - Higher patency Rate.



VENOUS DRAINAGE DISORDER

DVT

⊗ VIRCHOW'S Δ:-

- 1) Endothelial Injury
- 2) Stasis
- 3) Hypercoagulable State.

2) DVT Prophylaxis:-

Mechanical

- ① Early Ambulation.
- ② Pneumatic compression devices

Pharmaceutical

- ① UFH:- Unfractionated Heparin
- ② LMWH:- Low molecular wt. Heparin.

- In DVT, MC involved vein:- Calf Vein / Soleal Vein.

- MC involved vein in DVT Lf pulmonary Embolism:- femoro-popliteal vein (Thigh vein)

- clt:-
- ① Crampy pain
 - ② Edema → Initially pitting flb non-pitting)
 - ③ Low-Grade fever.

- ① ↑ Resistance to passive dorsiflexion of foot :- **HOMAN'S SIGN**
- ② **MOSES SIGN (BANCROFT'S SIGN)** :- pain on applicaⁿ of pressure over the calf Region.
- ③ **Pratt's sign**:- pain on squeezing of calf Region.

PHLEGMASIA ALBA DOLEN

- painful white leg
- Caused by :- occlusion of deep Venous system & intact collateral

PHLEGMASIA CERULEA DOLEN

- painful ~~white~~ blue leg
- occlusion of both Deep Vein system + collateral

* IOC :- Doppler

* Rx :- DOX for DVT :- **2U HEPARIN X 5 days.**

(Warfarin req. minimum 3 days to act)

[• Heparin monitoring is performed by Aptt → 1.5-2.5
 • Warfarin " " " INR → 2.0-3.0]

VARICOSE VEIN

- Dilated tortuous, Elongated vein.

Diameter $\geq$ 3mm

2 type:-

Primary

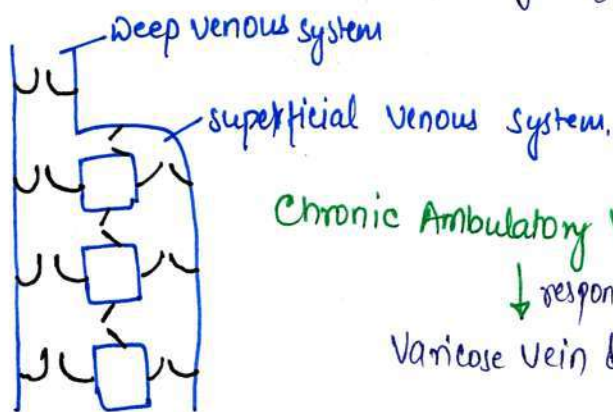
Secondary.

- Congenital predisposiⁿ & occupation Reinforcement.
- Surgeon's
- Teacher
- Traffic Policeman.

- MCC :- DVT
- other :- Pelvic mass
 - Pelvic sv.
 - Pregnancy.

Q1f: 1) Dull aching pain

2) Pedal Edema $\downarrow$ Subside completely after taking Rest. (iii) Limb Elevaⁿ



Chronic Ambulatory Venous HTN
 $\downarrow$ responsible for
Varicose Vein & its complicaⁿ

Complicaⁿ are :- (i) Hyperpigmentaⁿ

(ii) Lipodermatosclerosis.

(iii) Eczema

(iv) Ulceraⁿ.

$\rightarrow$ Locaⁿ :- 1cm above Medial Malleolus
for Healing of ulcer :- Limb Elevaⁿ
+ Massage + Compression stocking

Q - BISGARD'S REGIMEⁿ for Healing of ulcer :- Limb Elevaⁿ
+ Massage + Compression stocking

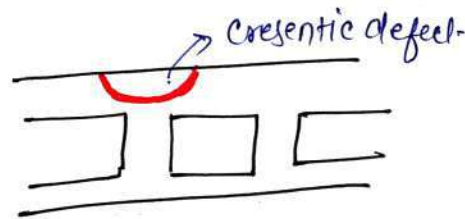
* Test in Varicose:-

(i) Morissey's test :- Cough impulse test

(ii) Perthe's test :- appearance of crampy pain after work/ Exercise when Elastic Bandage is applied over the lower limb.

When TORNICQUET applied Saphenofemoral juncⁿ

REGAN'S Test :- Crescentic defect in ^{deep} fascia on palpaⁿ @ the site of Incompetent perforator



BRODIE-TRENDELENBERG TEST :-

2 component :-

Component I

After milking the veins
↓
apply the Torniquet @
Saphenofemoral juncⁿ
↓
ask the pt. to stand
↓
Release Torniquet
↓
Rapid filling from above is
Suggestive of Incompetent
Saphenofemoral juncⁿ

Component II

After milking the vein
↓
apply the Torniquet @ SFJ
↓
ask the pt. to stand
↓
Slow filling from below
Suggestive of Incompetent perforators

*1) Doc for ASIS :- doppler :-

- ① System involvement :- long saphenous @ short saphenous.
- ② status of SFJ :- competent @ incompetent.
- ③ locaⁿ & status of SPJ (Saphenopopliteal juncⁿ) :- competent @ incompetent

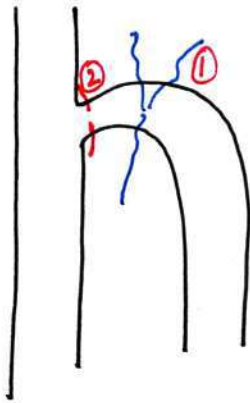
① DVT :- +ve (or) absent.

→ Presence of DVT is absolute C/P for stripping.

Rx → During stripping of "long" Saphenous Vein :- MC injured Nerve Saphenous.

→ " " " "Short" Saphenous vein :- MC injured Nerve Sural.

→ **TRENDELENBERG OPERATION :-**



① Ligaⁿ of Tributaries

① Superficial inferior Epigastric

② Superficial Circumflex Iliac

③ Superficial and deep External pudendal.

② Flush Ligaⁿ of long Saphenous vein @ Saphenous femoral juncⁿ

③ Stripping of long Saphenous vein till upper 1/3rd of leg

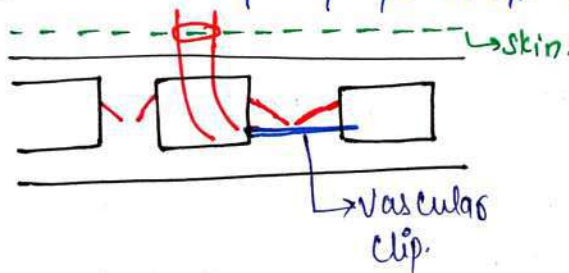
* If diameter < 3mm → Do Sclerotherapy

New Rx :-

① Radio frequency Ablaⁿ

② EVLA (Endovenous laser Ablation)

③ SEPS :- Subfascial Endoscopic perforator Sx. :- With the help of Endoscope vascular clip is applied just below deep fascia, for incompetent perforator

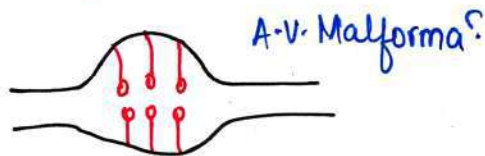


- ① clinical sign / symptom
- ② Etiology
- ③ Anatomical distribuⁿ
- ④ pathophysiological Dysfunction

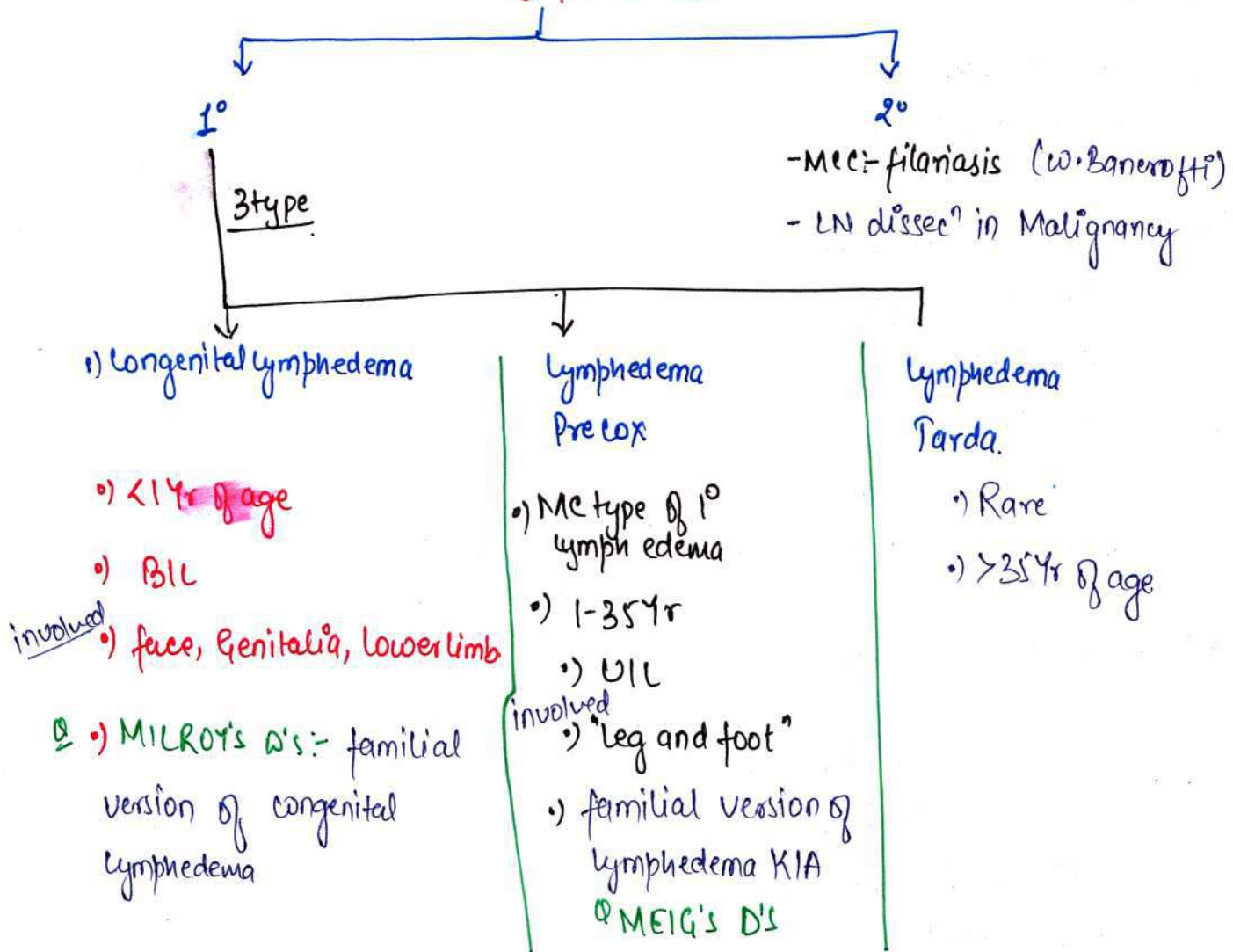
KLIPPEL - TRENAUNAY Synd :-

- Cutaneous Hemangioma
- A+V Malformaⁿ
- Local Gigantism
- Varicosity :- pathological Varicosity is Managed by Compression Stocking
- Absence of Deep Venous system :- Stripping is C/I.

KASSABACH - MERIT Synd:-



- Microangiopathic Hemolytic Anemia
- Thrombocytopenia.
- platelet trapping
- Consumptive Coagulopathy

LymphaticLymph Edema

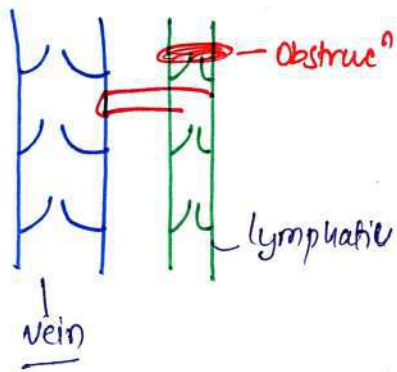
Meig Synd: → Ovarian Tu.

- Pleural Effusion
- Ascitis.

Rx: Most of pts managed conservatively by:-

- (i) Limb Elevaⁿ
- (ii) Use of compression stocking
- (iii) Antibiotic for infecⁿ

* Sx is Rarely performed
also ↑ Morbidity & poor Result.



Name of sx :- & type :-

Reconstructive

- ① NEIBULOWITZ operaⁿ
(aka lympho venous
Anastomosis)
- ② Gille's → Skin Bridge
is used for Reconstructⁿ
- ③ KINMONTH :- ileal Mucosa
is used

Excisional

- ① Charles
- ② Thompson's
- ③ Kontoleon's
- ④ Homan's

* Indicaⁿ of Referral to Higher Centre in pt. of Burn:-

- ① Partial thickness Burn involving $>10\%$ BSA
- ② Any full thickness Burn
- ③ Burn involving face, hand, foot, joints, Genitalia
- ④ Electrical Burn
- ⑤ chemical Burn
- ⑥ Burn $\pm$ Inhalational Injury.
- ⑦ Burn $\pm$ Trauma
- ⑧ Burn in Elderly ~~Requiring Special~~ ~~to~~ Having Co-Morbidity.
- ⑨ Burn in children requiring special Emotional Care.

Q:- Mee of death in burns @ the site of burn :- Asphyxia

Q:- Mee of Early death in Burn :- Hypovolemia/shock

Q:- Mee of late death in Burn :- Sepsis.

Q:- Overall Mee of death in burn :- Sepsis.

* Rx of Burns:-

- ① put two large bore IV cannula
- 2) Start IVF
- 3) Upper limb veins are preferred over lower limb.
- 4) If not possible b/c of Edema $\rightarrow$ Venous cut down is performed in lower limb

* Fluid of choice :- RL

* "Maintenance" fluid of choice in Burn in children:-

- ① RL
- ② 5% dextrose $\rightarrow$ for congenital hypertrophic Pyloric stenosis.
- ③ NS
- ④ D5S

- NS
- Hypertonic Saline
- fresh frozen plasma
- Albumin

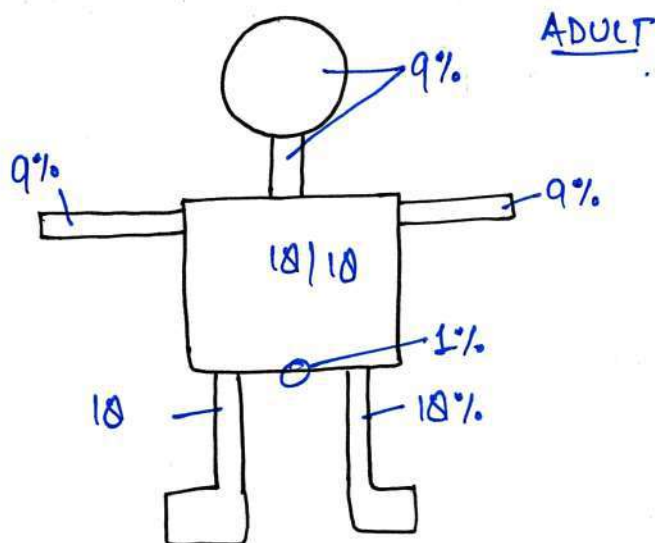
→ given in BURN SHOCK & is not responding to crystalloid.

- Best clinical indicator of tissue perfusion → Urine Output.

① in Adult :- 1ml/min

children :- 0.5 - 1.0 ml/min

"Rule of 9" - By Alfred Russel Wallace



* Most accurate technique / formula for calculaⁿ of Burn surface area in children :- ① LUND-BROWDER CHART ✓

② BERKOW'S FORMULA

* In Infant Body surface area in head & Neck :- 21%

* " " " " " " lower limb :- 13%

Rule of Palm :- used for mixed distribuⁿ of Burns and splash Burn.
palm :- 1% of BSA.

Of crystalloid.

Q: 50kg, 50%

① 100ml

$$4 \times 50 \times 50 = 10000$$

② 10,00

③ 10,000 ✓

$$= 200 \times 50 = 10000$$

⇒ Half of calculated fluid is given in 1st 8hr & Rest half of fluid is given in 16hr

⇒ 48hr requirement :- The 2nd day fluid Requirement is 40-60% of 1st day Requirement.

1st day: 10 litre

2nd day: 5 litre

Classificaⁿ of Burn wound :-

① 1^o Burn aka Epidermal Burn

- Only Epidermis is involved.
- Erythema & Redness @ the site of Burn
- Painful
- No Blisters
- It Heals w/out Scarring in 5-10 days.

Hot iron

② 2^o Burn :- aka Partial thickness Burn

Superficial partial thickness

- Epidermis + papillary dermis
- It's also Blister, painful, Healing occurs w/out Scarring in 6-14 days

Hot water

~~Deep partial thickness~~ Deep partial thickness Burn

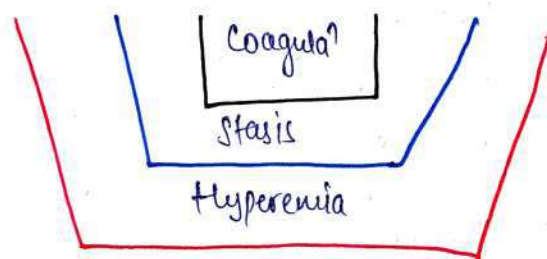
- Epidermis + Reticular dermis.
- appearance :- Burn surface appears :- Mottled whitish-pinkish area
- No Blister, No pain
- Pin-prick Sensaⁿ preserved
- Healing occurs w/ Scarring in 3-9 wk.

-) Epidermis + full thickness of dermis.
-) Burn_{surface} appear:- Black colour leathery Eschar
-) also ↑ risk of compartment synd.
-) No pain, NO Blisters, NO pin-prick Sensa?
-) Healing occurs in contracture forma?
-) To prevent Compartment Synd. :- Escharotomy is done.
- * To prevent contracture $\Rightarrow$ excision of Burn skin
 $\downarrow$
 Skin Grafting s/b performed in pt. after Resuscitation?

(iv) 4° Burn

- Skin + M's + Bone/Brain

- * 15°C > Room temp (0°C) tap water is used for cooling.
- * Cold water / Ice should not be used :- Convert viable tissue to Non-viable tissue.



Zone of Coagulum
 - Having non-viable tissue
 Ble of Coagulative tissue

Zone of Stasis
 Both Viable and non-viable
 tissues are present.

Zone of Hyperemia
 • Presence of dilated Blood
 vessels.
 • Healing occurs from X. of
 Hyperemia

* for Burn pts Topical antimicrobial are preferred over systemic Antibiotic

- ① 1% Silver Sulphadiazine
- ② 0.5 Silver Nitrate
- ③ 5% MEFENIDE Acetate
- ④ Silver Sulpha diazine + Cerium Nitrate

D-6

Mech. of

SKIN GRAFTING

* Acceptance of Graft by Recipient Bed, is K/A GRAFT TAKE

3 mechanism :-

- ① Imbibition
- ② Inosculation
- ③ Revascularization

IMBIBITION

- Graft Receives nutrition by diffusion
- It occurs upto 48hr

INOSCUATION

- Capillaries of graft and Recipient Bed are aligned
- Occurs after 48hr - 5 day

RE VASCULARIZATION

- After 5 days established arterial supply and Venous drainage occurs.

Causes of Graft failure:-

- ① Shear stress or Relative movement.
- ② Hematoma / Seroma
- ③ infect

* free of β -Hemolytic streptococci is an absolute C/I for skin grafting.

Skin Graft.

(THIERSCH)

- Use of: Epidermis + part of dermis
- Advantages:
 - (i) Large graft can be taken
 - (ii) Donor site heals spontaneously
 - (iii) Repeated Graft can be taken
 - (iv) Graft survival is easy
 - (v) Significant Graft contracture?
 - ↓
 - Cosmetic appearance is poor

(WOLF'S)

- Epidermis + full thickness of dermis
- Small graft can be taken.
- Permanent defect develop @ donor site that's why Repeated graft can't be taken
- Graft survival is difficult.
- Advantage: Graft contracture is lesser
 - ↓
 - Cosmetic appearance is better

* MC used donor site for partial thickness graft: - Inner aspect of thigh

* Donor site for full thickness graft:-

- (i) Upper Eyelid.
- (ii) Retro ~~orb~~ auricular Region
- (iii) Supraclavicular
- (iv) Anticubital
- (v) Inguinal
- (vi) Genital
- (vii) Gluteal
- (viii) Inframmary

blood supply

It is used to cover :-

- 1) Exposed Bone
- 2) Exposed Tendon
- 3) Exposed Nerve
- 4) Exposed joints
- 5) Irradiated field (means any ~~any~~ field where Radiotherapy can be given)

- 3 type :-

① Random

- Based on :-

① Subdermal plexuses of vessels.

- It is used to cover small full thickness defect.

eg:- if DIP got cut in RTA
↓
apply flap from
Hypothenar aspect &
cover the exposed
PPIP.

② Axial

- Based on Named Vessels

- If it Receives its blood supply from donor side
KIA Pedicle flap

- If it contain m's and skin KIA Myocutaneous.

- osseo myocutaneous :-
periosteum + m's + skin.

③ free

- completely devascularized from donor side and
Revascularize @
Recipient bed.

*** NIPPLE DISCHARGE:-**

- 1) Bloody discharge :-
 - Duct papilloma (MC) Q
 - Duct Ectasia
 - Carcinoma
- 2) Serous discharge :-
 - fibrocystic dis (MC) Q
 - Duct Ectasia
 - Carcinoma
- 3) Greenish / Blackish / Gromus / Pultaceous :- Duct Ectasia Q
 Thick paste like discharge

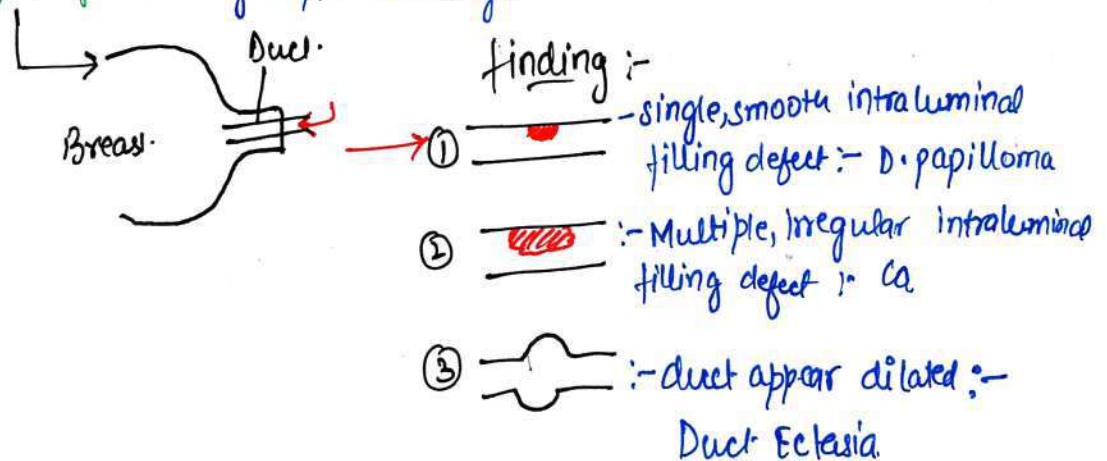
Q:- Young ♀ w/ Bil Serous Nipple discharge from multiple duct → highly suggestive of Benign etiology

Q Old ♀, Age > 50 +? w/ Bloody Nipple discharge coming from single duct also Mass is highly suggestive of :- Malignant etiology

Q:- Malignancy stb R/O in pt. having Nipple Discharge.

* 1st Ix done in suspected case of Ca-Breast :- Mammography

* Indicaⁿ of ductography :- Bloody Nipple discharge



Q:- Hadfield's Excision - Conical Excision of Involved duct in Duct Ectasia.

CA. BREAST

* R/f for Ca. Breast:-

- ① Advancing age
 - ② Origin:- Western Countries.
 - ③ High Socio-Economic Status.
 - ④ Alcohol
 - ⑤ High fat intake, Obesity
 - ⑥ State of Hyper Estrogenia :-
 - ① Early Menarche
 - ② late Menopause
 - ③ Nulliparity
 - ④ late 1st full term pregnancy
 - ⑦ Personal H/o of Malignancy:-
 - ① Endometrial Ca.
 - ② Ovarian Ca.

(Ca. Cervix not involved
∵ it is seen in poor)
 - ⑧ +ve family H/o
 - ⑨ Genetic Mutaⁿ → **BRCA-1** :- females
(Mn:- ladies 1st) **BRCA-2** :- Males
 - ⑩ Hormone Replacement therapy
 - ⑪ Therapeutic Radiatⁿ Exposure
- * OCP & smoking are not Risk factor
- * Breast feeding is protective for Breast Ca.

Histological type:-

Adeno Ca.

- MC Subtype:- Invasive ductal Ca.
- Least common type of Breast Ca:- papillary

*) MC site



MC site → UOQ :- ∴ of maximum amt. of breast tissue

*) Least Common Site:- ~~Lower~~ Lower Inner Quadrant

*) Most Malignant type of Breast Ca:- Inflammatory Breast Ca

*) Least " " " " :- Tubular Breast Ca. (Having Best prog)

*) MC Route of spread:- Hemato

*) MC site of Mets:- Mn:- LFT

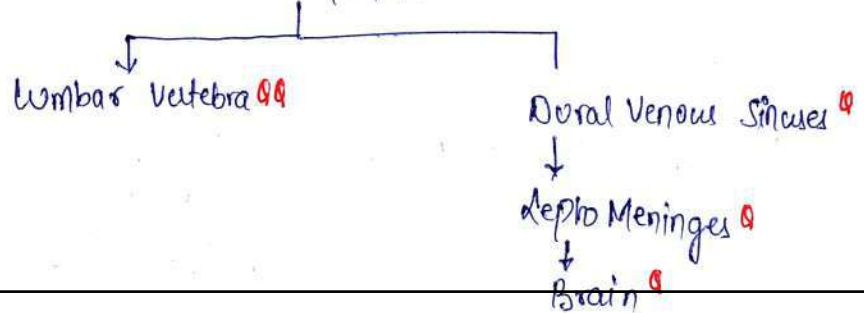
Lumbar Vertebra > femur > Thoracic ~~vertebra~~ vertebra

*) Responsible for both osteolytic and osteoblastic
(osteolytic > osteoblastic)

*) pathway of Metastasis in Breast Ca:-

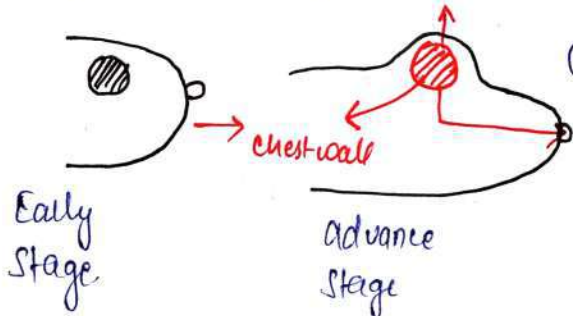
Breast Ca. cell → invade posterior intercostal vein

↓
Batson plexus



* Mcc of death in Ca Breast :- Malignant Pleural Effusion

*) Clf :- Mc presentaⁿ :- Lump.



* in advance stage :-

- (i) Architectural distortion
- (ii) Nipple Retract and deviaⁿ, ulceratⁿ
- (iii) Skin fixity
- (iv) fixity to chest wall

* OOO → Pneu-D-Orange :- Lymphatic permeation by T₀ cells

* Triple Assessment + positive predictive Value :- 99.9%.

- (i) clinical :- Sign Symptom.
- (ii) Imaging :- Mammography / USG
- (iii) Tissue sampling :- FNAC / Bx

Lx :- 1st Lx :- Mammograph done in suspected case of Breast Ca.

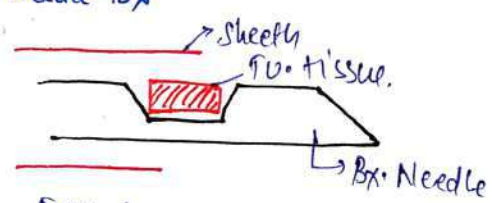
*) Doc for Asis of Ca Breast :- Bx.

FNAC

- Size of Needle :- 22-26 Gauge.
- Experienced cytopathologist is Req.
- problem :- (i) Difficult to differentiate DCIS from Invasive ductal Ca.
- (ii) difficult to assess Hormone Receptor status level.

Biopsy aka :-

- True cut Bx
- Core cut Bx
- Needle Bx



- Easy to assess Hormone Receptor Status and Easy to differentiate DCIS from Invasive ductal Ca.

- ① Loc for Screening of Breast Ca.
- ② Mammography s/b started in all the ♀ @ the age of 40yr
- ③ Annual Mammography is Recommended.
- ④ Radiation Exposure in mammography :- 0.1 c Gray / study

1 mammography = 4 cXR

1 cXR :- 0.25

- ⑤ Low dose Radiaⁿ Exposure during Mammography doesn't ↑ the Risk of Breast Ca.
- ⑥ Mammography can diagnose Breast Ca. in non-palpable stage & the mortality, improves the survival by >33%.

VII) views in Mammography :-

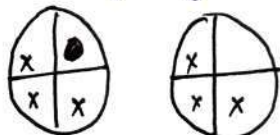
- ① Cranio-caudal :- Used to assess Medial aspect of Breast tissue & Breast compression
- Medio-lateral Oblique view :- used to assess maximum amt. of Breast tissue & Axillary tail of Spence.

VIII) BIRAD'S SCORE :- Breast Imaging Reporting and Data system.

Category

Descripⁿ

- 0 :- Incomplete assessment, Additional imaging is req.
- 1 :- ① Negative
② Annual mammography is recommended
- 2 :- Benign, Annual " " "
- 3 :- Probably Benign, Short-term follow up.
- 4 :- Suspicious, Bx is recommended.
- 5 :- Highly suggestive, Intervention is recommended
- 6 :- Bx proven Malignancy.



BREAST :- BIRADS $\xrightarrow[\text{on}]{\text{Based}}$ Mammography

THYROID :- TIRADS $\longrightarrow$ Sonography (USG)

PROSTATE :- PIRADS. $\longrightarrow$ MRI

$\Rightarrow$ Benign

On the basis of
opacity :- Regular Margin
(smooth)

- Homogenous.
- Low density (Like Breast)
- Thin Halo
(empty appearance)
around lesion.



- Macro calcificaⁿ :- $>0.5 \text{ mm}^2$

- Associated changes in the Breast are absent.

Malignant

- Irregular Margin
 - Stellate Margin
 - Spiculate "
 - Comet-tail Margin

} Margin

- Heterogenous.
- High density
- Wide Halo

• Micro Calcificaⁿ :- $<0.5 \text{ mm}^2$

- Nipple Retracⁿ
- Skin thickening
- Obliteration of Retro-mammary space

} associated changes.

Q :- 1st Lx done in Young $\neq$ Age $<35 \text{ Yr}$ $\bar{c}$ Breast Lump :- USG.

Q :- MRI is Doc for Screening of Breast Ca. in High Risk female

High Risk female means :- ① +ve family H/o

② BRCA mutaⁿ.

Q :- MRI is having maximum Sensitivity for Asis of DSIS.

Q: Loc for Asis of Breast Implant Related Complicaⁿ:- MRI.

PET Scan:- Positron Emission Tomography

- give 18-FDG

- 1st indicaⁿ:- It is loc for Asis of distant Metastasis. in most of malignancy.

- 2nd indicaⁿ:- PET Scan is used to differentiate Scarring, fibrosis, necrosis from Recurrence.

*1 Staging 8th AJCC (TNM Classificaⁿ) :-

T₁ :- <2cm

up to 2cm ✓ ⇒ ≤ 2cm.
72cm.

T₂ :- >2-5cm.

T₃ :- >5cm

T_{4a} :- Extension to chest wall (chest wall is formed by :- Ribs + intercostal m's + Serratus anterior)
Over-40yr old ♀ T₂cm ⊙ Breast Pectoralis Major involvement
70. L → 1

T_{4b} :- Skin changes in the Breast :- ulceratⁿ
Edema
Satellite Nodule
Pau-D-Orange

update Q Note :- Isolated involvement of Dermis, Nipple Retracⁿ, deviation, dimpling in the skin doesn't affect the stage.

T_{4c} :- T_{4a} + T_{4b}

T_{4d} :- Inflammatory Breast Ca.

N_1 :- Metastasis to L/L Axillary LN level I & II and it is Mobile

N_{2a} :- " " " " " " " " and it is fixed/matted

N_{2b} :- Clinically apparent- internal Mammary Node

↓
means detected on clinical Examinaⁿ / pathological Examinaⁿ /
Radiological Examinaⁿ Except Lymphoscintigraphy (Sentinal LN Bx)

N_{3a} :- Involvement of L/L infraclavicular LN

N_{3b} :- " " Axillary + internal Mammary LN

N_{3c} :- " " Supraclavicular LN

M_0 :- No Metastasis

M_1 :- Metastasis.

* Two lumps in the same Breast :- Staging is performed is based on the size of Bigger lump.

* Lump in Each Breast :- Staging is performed separately for each lump.

* Breast lump + involvement of Contralateral LN considered as Metastasis.

⇒ Staging of Co. Breast.

Stage I :- T_1 1

IIa :- T_{0-1}, N_1
 T_2 2

IIb :- T_2, N_1
 T_3 3

IIIa :- T_3, N_{1-2}
 T_{0-2}, N_2 4

IIIb :- T_4, N_{0-2}

IIIc :- Any N_3

IV :- Any Any M_1

Revis

① Early Invasive Breast Ca:-
(Stage I, IIa, IIb)

- Breast Conservatⁿ Sx + Axillary LN Sampling + Radiotherapy
- Simple / Total Mastectomy + Axillary LN Sampling
- Indicaⁿ of chemotherapy in Early Invasive Breast Ca:-

- ① Size of Tu. > 1 cm.
- ② LN +ve
- ③ Size > 0.5 cm, LN -ve $\cap$ Adverse prognostic factor:-
 - i) High histological grade
 - ii) Lympho Vascular invasion
 - iii) ER/PR -ve
 - iv) HER-2-NEU +ve

② Locally Advanced Breast Ca.

III A, III B, III C

Neoadjuvant chemotherapy + MRM + Radiotherapy.

③ Metastatic Breast Ca.

- IV

- Prolong the survival and improve the Quality of life

- 2 Rx Option:- Chemo therapy & Hormone therapy

→ Hormone therapy & chemotherapy is preferred.

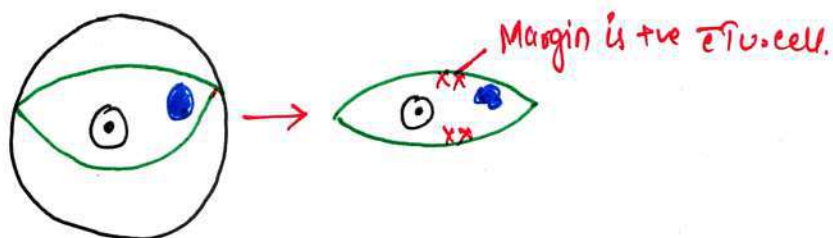
→ Indicaⁿ of Hormone therapy

- ① ER/PR +ve
- ② Asymptomatic Visceral Metastasis.
- ③ Bony or Soft tissue Metastasis

Indicaⁿ of chemo

- ① ER/PR -ve
- ② Symptomatic Visceral Metastasis
- ③ Hormone Refractory (not responding to H^o therapy).

- ① Breast Conservative Sx
- ② Locally Advanced Breast Ca.
- ③ 400 more the LN
- ④ the Margins.



Q: 40yr old ♀ with 4cm lump in Rt Breast & involvement of matted axillary LN, Preferred Rx:-

- ① Breast Conservative Sx + Axillary LN Sampling + RT
- ② Neoadjuvant Chemo Therapy. + MRM + RT. ✓
- ③ Chemo
- ④ Radio

Stage:- IIIa

Q: pt presented with 4cm lump in Rt Breast & ~~Path~~ Pseudo-Orange:-

→ Neoadjuvant + MRM + RT

IIIb

Q: 60yr old ♀ having Metastatic breast Ca & ER/PR+ve & symptomatic Visceral Met. Preferred Rx Option

- ① Hormone
- ② Chemo ✓

C :- Cyclophosphamide

M :- Methotrexate

F :- 5-FU

✓ C :- Cyclophosphamide

A :- Adriamycin

F :- 5FU

∴ CAF is preferred chemotherapy regimen.

↳ Adriamycin (Doxorubicin)

↳ Anthracycline derivative Based chemotherapy.

*) For Adriamycin Resistant Breast Ca:- Taxanes are given:-

① Docetaxel

② Paclitaxel.

*) Relatively new drug given for Adriamycin & Taxane Resistant Breast Ca:-
- IXABEPILONE*) LAPATINIB :- 2nd Line Agent for Her-2-Neu +ve Breast Ca.*) TRASTUZUMAB/HERCEPTIN:- 1st Line Agent " " " " " "

* HORMONE THERAPY:-

① Ovarian Ablation:-

*) Bil oophorectomy

*) LHRH agonist:- GOSERELIN
LEUPROLIDE② SERM :- Tamoxifen
Raloxifen.

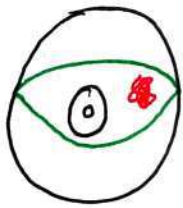
③ Aromatase Inhibitors :- ① Non-Steroidal:- Letrozole, Anastrozole

② Steroidal :- Exemestane

④ Anti-Estrogen:- FULVESTRANT

PROGESTIN :- MEGESTROL

① Simple/ Total Mastectomy:- En-block Removal of Nipple Areola skin, Breast tissue, Breast Mass



~~Other structures like lymph node are removed~~

2) Extended Mastectomy:- Simple Mastectomy + Removal of Level I lymph node.

3) Modified Radical Mastectomy:- En-block Removal of Nipple areola skin, Breast tissue, Breast Mass + Level I & II LN

4) HALSTEDT Radical Mastectomy:- En-block Removal of Nipple Areola skin, Breast tissue, Breast Mass + Level I, II, III + Excision of pectoralis Major & Minor. LN

* Structure spared :- Mn:- A - Axillary vein
B - Bell's Nerve
C :- Cephalic Vein.

5) Extended Radical Mastectomy:- Mn:- R + IM
↓
Radical Mastectomy → Removal of Internal Mammary LN

6) Super Radical Mastectomy:- RM + SIM
+
Radical Mastectomy → Removal of:
Supraclavicular LN
Internal mammary LN
Mediastinal LN

Modificaⁿ of MRM:- ① AUSCHINCLOSS :- MRM

② Patey's Modificaⁿ:- En-block Removal of Nipple areola skin, Breast tissue, Breast Mass + Level I, II, III + Excision of p. Minor.

③ Scanton's Modificaⁿ:- En-block Removal of Nipple areola skin, Breast tissue, Breast Mass + Level I, II, III + division (not the excision) of p. Minor.

- ① Seroma :- Mc (30%)
- ② Wound Infecⁿ / flap Necrosis.
- ③ Injury to long thoracic Nerve → ^{supply} Serratus anterior
- ④ Injury to thoracodorsal Nerve → ^{supply} latissimus dorsi
- ⑤ Persistent axillary fat pad.
- ⑥ Lymphedema.

→ **STEWART TREVES synd** :- Angiosarcoma

Occurring in Ca Breast pt. after Radiotherapy.

→ Average duraⁿ :- 10.5 Yr B/w Radioⁿ

Exposure and development of Angiosarcoma.

Types of Breast Reconstruct:-

① Autogenous

- Tram flap (Mc)
- LD flap (latissimus dorsi)
- Thoraco-Epigastrie flap
- Lateral thigh flap
- Gluteal flap.
- Ruben's flap :- Based on deep circumflex iliac artery.

② Alloplastic

- Silicon Gel implant
- Silicon implant + Saline Refill.



* preferred locaⁿ of implant placement is

Beneath Pectoralis Major.

③ Combined

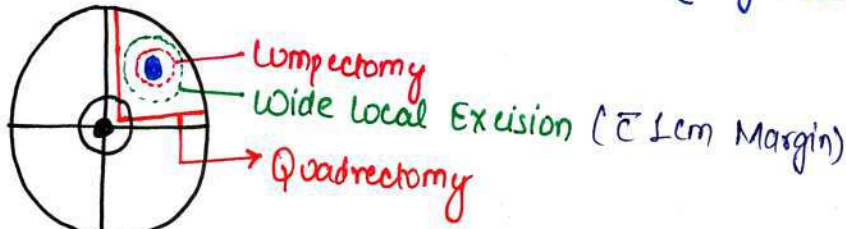
- It is used for the ♀ having large Breast
- TRAMFLAP + IMPLANT
- LD FLAP + Implant

* Doc for ASIS of implant Related Complicaⁿ :- MRI

Breast Reconstruction
&
Breast Augmentation } World wide

* Breast Conservaⁿ Sx :-

*) performed for:- Early Invasive Breast Ca. :- (Stage I, II_A, II_B)



* Contra Indicaⁿ for Breast Conservaⁿ Sx (Radiotherapy) :-

Absolute

- 1) Pregnancy
- ii) 2nd or >2 to. in diff^t Quadrant (or) Malignant appearing diffuse Micro Calcificaⁿ
- iii) Persistently positive Margins
- iv) No therapeutic Radioⁿ Exposure (40-60 Gray)

Relative

- i) Collagen Vascular D's :-
 - *) Scleroderma
 - *) Active Lupus Erythematosus.
- ii) Multiple fcs in Same Quadrant (or) Indeterminate Calcificaⁿ (पता नही चल पा रहा)
- iii) large T_u in small Breast.
- iv) large pendulous Breast (sagging)
- v) Centrally located T_u :- located beneath Nipple and Areola.

* Inflammatory Breast Ca. aka. Mastitis Carcinomatosa :-

Stage I_{4d} :- III_B.

definⁿ :- involvement of 33% of Breast skin by inflammatory changes.

* inflammatory changes :-

- i) Erythema, ii) Brownish induration
- iii) Early Onset of Peau-d'Orange.

→ T_u → 0 → 0 → 0

↓
Early LN metastasis

1) Presence of Lump/Mass is not Mandatory:-

① Inflammatory Breast Ca.

② Paget's D's of Nipple

* Clinical presentation:-

1) >75% pt. +ve to Axillary LN Metastasis

2) 25% pt. +ve to Distant Metastasis.

3) It is Most Malignant type of Breast Ca.

* Doc:- Skin Bx (only type of Breast Ca.)

→ presentation of Tumor cell in lymphatic.

Rx:- Neoadjuvant chemotherapy + MAM + Radiotherapy aka Multimodality Rx.

↓
5Yr Survival:- 30%

⊗ BREAST CA. IN PREGNANCY:-

1) Incidence:- 1:3000 pregnancies

2) MC non-Gynecological Malignancy of pregnancy

3) MC Histological Sub type:- Invasive ductal Ca.

* Clf:- 1) MC presentation:- Lump

2) Pregnancy induced changes mask the sign & symptom of Breast Ca. leading to presentation in Advanced stage.

3) >75% pt. is having Axillary LN Metastasis @ the time of presentation.

Loc: Bx.

1st trimester
done in suspected Ca. in preg
dump Breast

Rx: Principles

- ① Maximum Risk of abortion occurs in 1st trimester so GA Anesthesia should not be given in 1st trimester
- ② Organogenesis mainly occurs during 1st trimester that's why chemo. should not be given in 1st trimester
- ③ Radiotherapy should not be given during preg

Management:-

- ① Early INVASIVE Breast Ca:- Simple Mastectomy + Axillary LN sampling
- Locally advanced " " :- Neoadjuvant chemotherapy (after 1st trimester)
+
MRM (during 2nd trimester)
+
Radiotherapy (after delivery)
- * If Metastatic Breast Ca in preg:- Rx as ① women not as preg women

Male Breast Ca.

:- 1% of Breast Ca.

*) MC type:- Invasive ductal Ca.

Male do not have lobule.

in Both
♂ & ♀

- *) ER/PR +ve :- in 80% case
- *) Her-2-Neu +ve :- 85% case

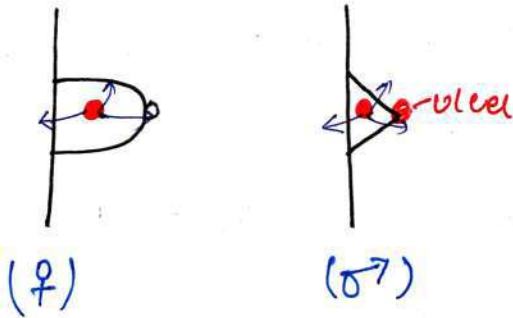
* Lobular Ca. is exclusively seen in female Breast Ca

Rif: ① State of Hypogonadism:-

- *) Cirrhosis of liver (CED)
- *) Androgen insensitivity synd (testicular feminization synd)
- *) Infertility
- *) B/L Undescended testis.
- ② Klinefelter synd.
- ③ BRCA-2 muta?

Breast Ca.

1) f: Mc presentaⁿ: Lump. (Both ♂ & ♀)



2) In ♂: Early involvement of Nipple, skin & chest wall occur d/t scanty Breast tissue.

Loc: Bx

Rx: 1) Stage by stage Rx

2) Prognosis is similar to ♀ Breast Ca.

CYSTOSARCOMA PHYLLODES

- Phyllode's Tuo.

- Serouscic W's of Brodie

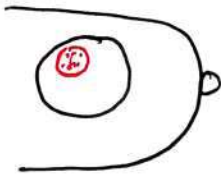
- It is characterized by bi-phasic proliferaⁿ of Stromal tissue (+) Mammary Epithelium.

- Age - 4th to 6th decade

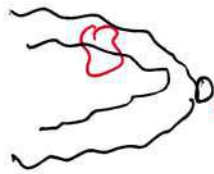
Can be:-

- Benign, Borderline, Malignant

- On cutisⁿ :- leaf like appearance
 Monoclonal stroma.



→ Multi coloured skin having both solid and cystic area.



Clf:- Massively Enlarged having Bosellated appearance & Multi coloured skin.

Unique feature:-

- ① also Hematogenous spread only, lymphatic spread not seen.
- ② Characteristically 3 structure are not involved:-

- ① Nipple
- ② Breast skin
- ③ Chest wall

③ It is mobile

④ Mc site of Metastasis :- Lung

→ I/O for Dx :- Bx

Q:- & Benign appearing Cystosarcoma phylloid

Tx:- ① Wide local Excision ✓ = for Benign appearing Cystosarcoma phylloid

② Simple Mastectomy = for Malignant Cystosarcoma phylloid.

③ MRM. = Should not be performed in cystosarcoma phylloid b/c it's not also LN metastasis.

* VAN-NUY'S PROGNOSTIC INDEX (VNPI):-

→ DCIS :- Wide local Excision +/- Radiotherapy.

→ It is used for DCIS :- to assess the pt. in whom Lx (WLE) is sufficient.

- ① S :- Size
- ② W - Width of Margin
- ③ A - Age
- ④ G - Grade
- ⑤ MICROCLACIFICATION

* NOTTINGHAM PROGNOSTIC INDEX:-

$$NPI = (0.2 \times T_u \cdot \text{Size}) + LN \text{ Stage} + T_u \cdot \text{Grade}$$

↓ used for
to select pt. for adjuvant Rx.

* BLOOM- RICHARDSON GRADING:-

- T :- Tubule formaⁿ
- N :- Nuclear pleomorphism
- M :- Mitosis.

AIMS
* **Multigene Test** :- ~~Ass~~ Test used to predict Survival, Response to chemo, and Recurrence Rate based on Expression of m-RNA of multiple gene in tumor specimen.

- ① Oncotype Dx :- 21 gene assen
- ② Pam-50 :- 50 gene "
- ③ Mamma print :- 70 gene "

Oncotype Dx is used for.
Ca. Breast.
Ca. Colon.
Ca. Prostate.

→ **Oncotype Dx** :-

- *) Multigene test
- *) Used to predict, Survival, Responsiveness to chemo and Recurrence Rate.
- *) In a Newly diagnosed case of Breast Ca. in young ♀ having prognostic factor.

② LN ⊕ ⊖

③ HER-2-Neu ⊖

} - Good prognostic factor

* MOLECULAR CLASSIFICATION OF BREAST CA.

- Based on Gene Expression profiling.

- LUMINAL CRITERIA:-

① LUMINAL-A:- ER⊕ PR⊕ Her-2-Neu⊖ (Mc type)
Double +ve
→ Best prognosis

② Luminal B:- ER⊕ PR⊕ Her-2-Neu⊕
Triple +ve

③ Normal Breast Like:- ER⊕, well differentiated

④ Basal cell type ER⊖ PR⊖ Her-2-neu⊖
Triple Negative Breast Ca (TNBC)
→ +ve for Myoepithelial Marker & cytokeratin 5, 6, 17, 9

⑤ Her-2-Neu:- ER⊖, PR⊖, Her-2-Neu⊕ → POOR PROGNOSIS.
type

*

BRCA-1

Ch. 17

BRCA-2

Ch. 13

Young

- BIC Breast Ca.

- Invasive Breast Ca.

- poorly differentiated

- Hormone Receptor is -ve

- ↑ risk of 3 Malignancy:-

O - Ovary

C - Colon

P - prostate

- well differentiated

- Hormone Receptor +ve

↑ risk of 3 Malignancy:-

O - Ovary

C - Colon

P - Prostate

G - GB

S - Stomach

M - Melanoma

pancreas

Ovary Ca :- 30-40%

ANDI

⊗ FIBROADENOMA:-

- Benign Tu.
- Young ♀
- aka - Breast Mouse

C/f:- MC presentⁿ:- LUMP

Very Mobile:- Breast Mouse

IO:- FNAC → **ANTLER HORN CONFIGURATION**
on Mammography + popcorn calcificaⁿ

R:- Observaⁿ

Excision is done for cosmetic Reason.

⊗ ZUSKA'S D's:-

- 1) Recurrent Periductal Mastitis
- 2) MC in Smoker
- 3) Recurrent Breast abscess.
- 4) R:- I&D & Antibiotics.
- 5) MC organism responsible for Breast Abscess in lactating ♀:- Staph Aureus.

⊗ MONDOR'S D's

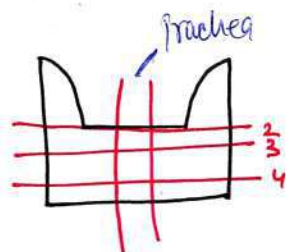
- Superficial thrombophlebitis of infra-Mammary vein
- MC:- lateral thoracic, Thoraco Epigastric Vein
- on palpaⁿ:- appear as **STRING PHLEBITIS**.

R:- NSAID & Breast support.
↓ non responding

Excision of thrombophlebitic Vein.

THYROID

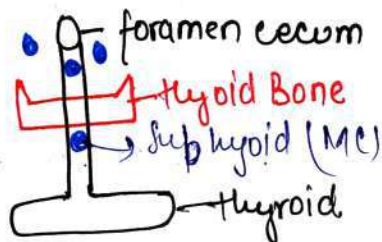
- wt % 20-25 gm
- >90% of Body's Iodine is stored in Thyroid
- Iodine Requirement :- 100-150 μ g/day.
- Size of thyroid is inversely proportional to Iodine intake
- Theodor Kocher :- father of thyroid Sx.



Isthmus is mainly in relaⁿ to 3rd
Cricoid Ring

THYROGLOSSAL CYST

- Congenital.
- Age of presentaⁿ :- 15-30 Yr



Mc site :- Subhyoid.

Other :- Supra hyoid

- Near thyroid Cartilage
- Near foramen cecum
- In floor of Mouth.

clt :- ① pt. +it $\bar{c}$ Mid line swelling in the anterior part of Neck moving well
 $\bar{c}$ Deglutition.

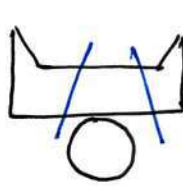
- Move up $\bar{c}$ Protrusion of tongue

Complicaⁿ :- ① Infecⁿ
② Abscess

② $\uparrow$ risk of Malignancy :- papillary Ca.

* I & D of abscess can lead to thyroglossal fistula (Acquired)

Rx :- Sistrunk operaⁿ



* En-block Removal of Central part / Body of Thyroid Bone

ENDEMIC GOITER

- 1) $>5\%$ people in populaⁿ are having Goiter
- * **Retrosternal Goiter** :- $>50\%$ of Thyroid tissue is located below Neck
(or)
Substernal ↳ * Manifestⁿ :-
(or)
Mediasternal Goiter
- ① dyspnea (Mc) :- dlt compression of trachea
 - ② Dysphagea :- dlt " " " Esophagus.
 - ③ Hoarseness of voice " " " RLN
 - ④ Dilated Vein over anterior chest wall.
 - ⑤ Pemberton sign is +ve :- On upper limb Elevⁿ above forehead
↓
facial congestion, puffiness or dizziness

Rx :- Thyroidectomy by Cervical Incision.

- I^{123} :- 13 hr :- Used for RAI Scan (diagnostic)

- I^{131} :- 8 day :- RAI Ablation (Therapeutic purpose)

* **Definⁿ :-**

- ① Radio Iodine uptake :- It's amt. of Radioactive Iodine taken by Thyroid Gland in stipulated period of time usually 6-24 hr
- ② Radioactive Iodine Scan :- Scanning of Co Region w Gamma probe
- ③ Hot Nodule :- Nodule w takes Radio active Iodine

1) Risk of Malignancy :- 1-3%

✓ Risk of Malignancy:- 17-20%

⑤*) RAI Ablation:- Isotope used is:- ^{131}I

^{131}I emit $\rightarrow$ β -rays + γ -rays

(90%) (10%)

*) Responsible for therapeutic effect

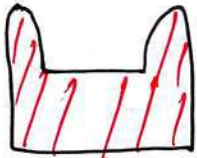
*) Responsible for S/E
*) Tracer studies

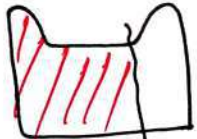
*) depth of penetraⁿ of β -ray:- 0.5mm.

*) Absolute C/Iⁿ RAI Aba?

✓ pregnancy.
✓ lacta?

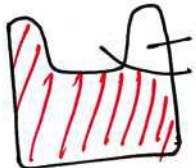
*) Types of Thyroidectomy:-

①  Total thyroidectomy

②  Hemithyroidectomy :- Removal of 1 lobe & isthmus.

4-6gm ③  :- Sub total

leaving 4-6 gm of thyroid tissue in each lobe superiorly & Removal of Rest of thyroid Gland.

④  :- Hartley - Dun Hill leaving 10-12gm of thyroid tissue in ① lobe & Removal of Rest of thyroid

⑤ Near-total :- leaving small Remnant of thyroid tissue in thyroidectomy Tracheo-ESO. Groove

Benign disorders involving (1) lobe Hemithyroidectomy is done

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www.FirstRanker.com

* Benign n Both lobe of thyroid (or) thyroid Malignancy

Total thyroidectomy is done

* Subtotal thyroidectomy was performed for multinodular goitre on prolonged follow up (after 20-30 yrs) Recurrence occurred from the thyroid remnant that's why only indicaⁿ of Sub-total thyroidectomy is Elderly pts & Multinodular Goitre

Solitary thyroid Nodule:-

1) MC is :- Colloid Goitre > follicular Adenoma.

2) 1st Lx:- Thyroid function Test (TFT)

↓ in this

TSH is most informative. B/c of ultra sensitivity

↓ B/c of this

It can detect:- Subclinical Hypothyroidism.
Subclinical Hyperthyroidism.

3) IOC:- FNAC

4) Limitation of FNAC:-

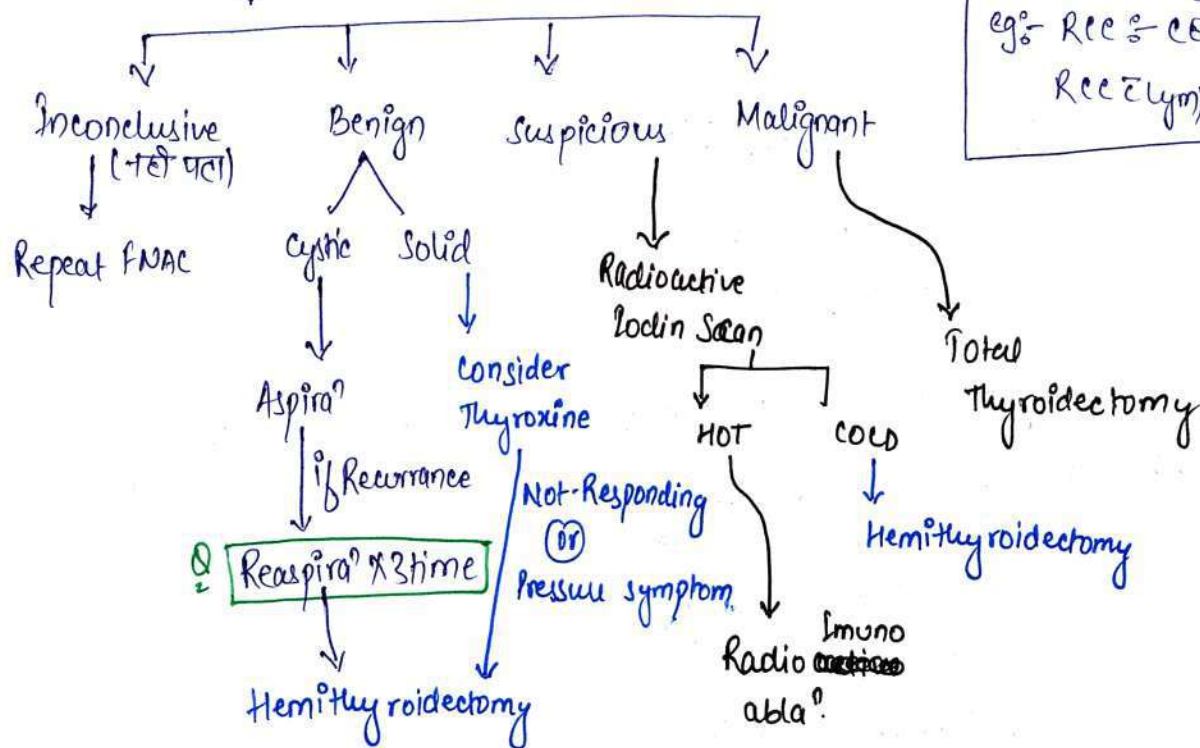
① It can not differentiate B/w follicular Adenoma from follicular Carcinoma.

[Diagnosis of follicular Carcinoma is based on Vascular Invasion (or) Capsular Invasion which is not seen on FNAC]

② It can not diagnose Reidel's thyroiditis.

③ Thyroid lymphoma (b/c for lymphoma have to do Bx to put marker)

for all lymphoma in body.
www.FirstRanker.com
eg:- Rec & CECT
Rec Lymphoma: Bx



* Basic funcⁿ of thyroid:- BMK

① ~~Thyroid~~ Man → Energy.

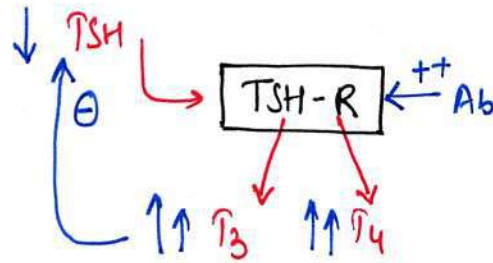
* Mcc of Hypothyroidism (World wide) :- Hashimoto thyroiditis.

Mcc of Hyperthyroidism (World wide) :- Grave's D's

All thyroid Related disorder:- MC in ♀

GRAVE'S D'S (Diffuse Toxic Goitre)

- Autoimmune Disorder
- Auto antibody against Thyroid stimulating Receptor
- ① also HLA B-8/DR-3
- ② also Thyrotoxicosis
 - ① Ophthalmopathy (Exophthalmos)
 - ② Dermopathy (Pre-tibial Myxedema)
 - ③ Acropathy (Sub periosteal New Bone formaⁿ in Metacarpal)
 - ④ Gynecomastia.



* In pt of hyperthyroidism:- ↑ Expression of Beta Receptor occur leading to sympathetic stimulation :- Signs & symptoms ↓

- ① Tachycardia
- ② Palpitation
- ③ Excessive sweating
- ④ Mental irritability/irritability
- ⑤ lack of sleep
- ⑥ fine Tremor seen in fingers & tongue

* Thyroid stimulation sign & symptom B/c ↑ BMR :-

- ① ↑ appetite But wt. loss.
- ② Heat intolerance.
- ③ Excessive sweating
- ④ M.C GI symptom :- Diarrhea.
- ⑤ In young pt CNS symptoms are predominant.
- ⑥ In elderly pt CVS " " " " like AF, Congestive HF.
- ⑦ In children :- Early growth and maturation.
- ⑧ In female :- Amenorrhea, ↑ Risk of Abortion & Infertility.

* Hypervascularity is Most prominent @ Superior pole.

1) There is audible Bruit.

2) " Venous Hum and palpable thrill

* It is also $\uparrow$ Radio active Iodine uptake.

Diagnosis:- ① presence of Eye sign in pt. of hyperthyroidism $\rightarrow$ confirm diagnosis.

② Auto Antibodies :- Single Ex.

* Rx:- ① Non- Selective β -B:- PROPRANOLOL

② Anti-thyroid Drugs:- ① METHIMAZOLE

This is given just to pt. to make the

pt. Euthyroid & to prepare for Sx.

1) pt. become Asymptomatic in 2 wks.

2) pt. become Euthyroid in 6 wks.

② CARBIMAZOLE
③ PROPYL THIOURACIL } - SIE AGRANULOCYTOSIS.

SIE * Methimazole is also $\uparrow$ risk of Congenital Malformations:- Aplasia Cutis

SIE * Propylthiouracil :- $\uparrow$ risk of Hepatic failure in female and children. Choanal Atresia

* Doc in preg :- CARBIMAZOLE

* Anti-thyroid Doc in Grave's :- METHIMAZOLE

* " " " " Thyrotoxic crisis :- PROPYLTHIOURACIL

$\downarrow$
Block peripheral conversion
of $T_4 \rightarrow T_3$.

③ Radioactive Iodine Ablation :- for ① Elderly pt.
② pt. w/ comorbidity
③ Recurrence after Sx.

1° preg.
2° Lactation

1° Young pt.
2° Smoker.
3° Ophthalmopathy

(iii) Indicaⁿ of Sx :- ① AU CII of RAI.

② Large Nodule ③ Suspicious of Malignancy

Sx :- Total thyroidectomy

HASHIMOTO'S THYROIDITIS.

aka. - STRUMA LYMPHOMATOSA

Thyroid

conversion into ~~thyroid~~ lymphoid.

- Conversion of thyroid tissue into lymphoid tissue
- Auto-immune Disorder alw Auto antibody :- Anti-TPO.
- Alw HLA-B8/DR-3/DR-5
- It ↑ risk of :- ① Thyroid lymphoma
② Papillary Carcinoma of thyroid.

- Etiopathogenesis :- CD4 mediated CD8 cytotoxicity

↓ CIT

Permanent destrucⁿ of thyroid follicle

↓ CIT

Permanent Hypothyroidism.

New update

AIIMS

↑TSH = ↓vit-D

Clt :- Sign & symptom of hypothyroidism = Mild Enlargement of thyroid

↓ CIT

↑ Circumference of Neck.

•) On FNAC:- Lymphocytic Infiltrate?
↳ Hurthle cell / ASKANAZY CELL

Rx:- Life long THYROXINE

DE QUERVAIN'S THYROIDITIS.

AIKA - Subacute thyroiditis

- Viral
- Granulomatous
- Giant Cell

•) It is characterized by URTI caused by Virus leading to Granulomatous inflama? leading to follicle destruc?

•) also HLA B-35

•) Stages :- ① Hyperthyroid.

② Euthyroid.

③ Hypothyroid.

④ Euthyroid → "spontaneous Resolu" occur in 75%.

•) C/t:- ① pain and tenderness in thyroid region

(+)

Sign and symptoms of Hypothyroidism / Hyperthyroidism

•) Lab:- •) ↑ RAI uptake

•) ↑ ESR (dit inflama?)

DOC :- FNAC (GIANT CELL)

Rx:- •) DOC - NSAID $\xrightarrow[\text{Responding}]{\text{Non}}$ Steroid.

•) >75% spontaneous Resolu?

REIDEL'S THYROIDITIS

- Invasive fibrous thyroiditis.

→ Complete Replacement of thyroid and para-thyroid by fibrous tissue.

→ a/w :- ① Retro-orbital fibrosis

② Peri-orbital fibrosis

③ Retro-peritoneal "

④ Sclerosing cholangitis.

clf :- pt. present c sign and symptom of hypothyroidism and hypoparathyroidism

c Evidence of compression like :-

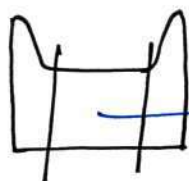
i) dyspnea

ii) dysphagia

iii) Hoarseness of voice

O/E :- Thyroid Gland is Hard and Woody

IOC :- Bx



Wedge-shaped Excision Bx

Rx :- Life long thyroxine + Life long Calcium and Vit. D.

THYROID MALIGNANCY

- MC :- papillary > follicular > Medullary > Anaplastic

Papillary Carcinoma

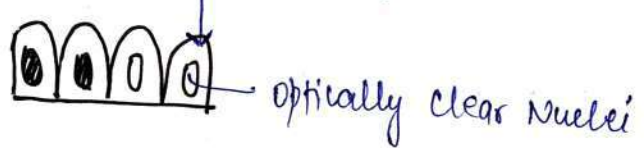
- MC thyroid malignancy

- seen in Iodine sufficient area

- low dose exposure during childhood Atn risk.

pseudo- Inclusion Bodies. Nuclear Groove

Orphan- Annie Eye Nuclei



Optically clear Nuclei

Clf: pt. + nt $\bar{c}$ palpable swelling in the anterior part of Neck in Mid line

↳ Lateral aberrant thyroid is Metastatic deposite from papillary Car thyroid to Lateral Cervical LN.

↳ Most Common Route of Spread :- Lymphatic

↳ MC Site of Mets :- Lung

↳ Doc :- FNAC

↳ Rx :- Total thyroidectomy + Removal of Enlarged Central group of LN. +/-
ILC MRND (Modified Radical Neck Dissec)
↳ if LN is +ve then do.

FOLLICULAR CARCINOMA

- Seen in Iodine deficient area.

- MC malignancy seen in long standing Goitre

- Age :- 5 / 6th Decade

- Mutaⁿ: ① PAX-8 / PPAR-1
② P-TEN
③ P53
④ RAS.



Clf: Sudden ↑ in size of swelling in long standing Goitre $\bar{c}$ Minimal $\odot$
No pain. $\bar{c}$ out any Evidence of Compression.

* MC site of Met :- Bone
↓

Flat bone :- Vertebra > Ribs > Pelvis > Skull.

*) 1st osteolytic 2nd / Proliferative 2nd → Rec follicular

*) Lymphatic spread is Not Seen.

~~Ex:~~ *) FNAC is not able to differentiate follicular adenoma & ca. B/c diagnosis of Malignancy based on capsular (or) Vascular invasion

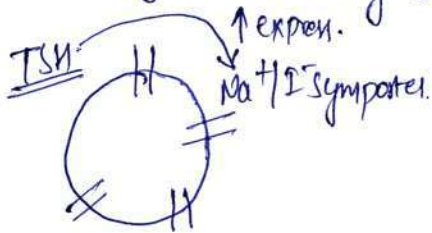
loc :- Bx

Rx :- Total thyroidectomy.

* post-op. Mx of well-diff. thyroid Ca :-

① Thyroxine suppression :- High dose thyroxine is used for suppression of TSH. it slb continued for 4-6 wks

② Whole Body Scan :- By Iodine ¹³¹I



*) T4 slb stop atleast 6 wks before whole body scan, if pt. is not able to tolerate Hypothyroidism switch T4 to T3 and stop T3 atleast 1 wks before whole body scan.

*) If pt. is not able to tolerate the symptoms give Recombinant TSH atleast 48 hr before whole body scan.

*) Whole body scan make thyroglobulin a better marker for post-operative follow up.

- ① Thyroglobulin $\rightarrow$ $516 \leq 2 \text{ ng/ml}$
- ② USG Neck
- ③ Chest X-ray

If Thyroglobulin $\uparrow$ $\rightarrow$ Indicate Recurrence

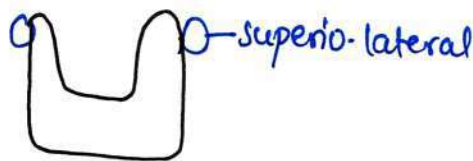
Q: Indicaⁿ of PET scan: Rising thyroglobulin $\rightarrow$ ④ USG Neck and CEA.

* The Recurrence is Managed by Radioactive Iodine ablaⁿ.

MEDULLARY CA. OF THYROID

- arise from para-follicular C-cell.

Locaⁿ



- derived from ULTIMOBRANCHIAL BODIE
- $\uparrow$ Calcitonin $\rightarrow$ then also Ca^{2+} is ⑤ (Normocalcemia)
- 2 type:-

SPORADIC

- 5th/6th decade
- single
- UIC

MEN 2A/2B

- Young pt.
- Multiple
- Bil

RET - PROTOGENE Mutaⁿ

also :- ① $\uparrow$ Calcitonin and $\uparrow$ CEA

② Diarrhea

③ FNAC: Amyloid stroma

④ +ve family Hlo :- pheochromocytoma, Hyper parathyroidism.

⑤ Both lymphatic and Hematogenous spread

⑥ MC site of Met:- LIVER - Malignant Melanoma

- Medullary Ca. of thyroid.

Three non-GI Malignancy

→ Radio active Iodine is not Effective

A) Chemotherapy is having very limited Role in thyroid Malignancy

* IOC :- FNAC

* Rx :- Total thyroidectomy ⊕ Routine Central lymphnode dissecⁿ ⊕ I/L MRND
if size of tu. is > 1cm ⊕ B/L MRND if any LN +ve

↳ also poor prognosis.

ANAPLASTIC Ca

↳ Rare

↳ 7th/8th decade

C/f :- Sudden ↑ in size of swelling

↳ Severe pain over the swelling

↳ Evidence of compression +ve :- dyspnea, dysphagia, ~~hoarseness~~
Hoarseness of voice.

* MC Route of spread :- DIRECT INVASION

* MC site of Met :- lung

* IOC :- FNAC

Rx :- for Resectable Malignancy :- Total thyroidectomy
UnResectable " :- Tracheostomy

Q :- Superior thyroid vessel shd ligated close to thyroid to prevent injury of
External branch of Superior laryngeal Nerve.



* Inferior thyroid artery is ligated closed to thyroid to prevent vascular infarction of parathyroid gland.

* Hypocalcemia ^{seen} after thyroid surgery. Manifestation: 2-5th day.

* MCC of thyrotoxic crisis in intra-operative: Inadequate pre-operative preparation.

SUTURES

Absorbable

- Absorbed by the body either enzymatic digestion or phagocytosis.

① Natural :-

- ① Catgut
- ② Chromic Catgut

② Synthetic :-

P - Polyglycolic acid, Polylactide
 V - Vicryl (Monocryl) (PDS)
 D - Dexon $\xrightarrow{\text{Kla}}$ Polyglactin
 $\xrightarrow{\text{Kla}}$ (polyglycolic acid)

Non-absorbable

- Persist for indefinite period of time

① Natural :-

- ① Silk
- ② Linen

② Synthetic :- PEN

- Prolene (Polypropylene)
- Polyester
- Ethilon
- Nylon

Types of Suture :-

Monofilament

- Contain single strand.
- Smooth
- Knots are less stable

Advantage: QW & Risk of infection

- eg:- Prolene
 - Ethilon
 - Catgut

Polyfilament

- Multiple strands. Braided together
- Knots are stable
- Sutures are having crevices $\rightarrow$ risk of infection

- eg - Silk Mn: 'Slip'
 - Linen

* prep from Sheep's Ileum
Submucosa of

* The preservative Soluⁿ is used ISOPROPYL Alcohol

VICRYL :- aka WORK-HORSE suture of General Surgeon

* polymer of Glycolide + Lactide

⊗ for :-



urinary Bladder

MC
⇒ Used suture
↓
Vicryl

* Non-absorbable suture
Should not be used b/c it ↑
the risk of stone formation.

PDS :-

advantage :- low affinity for adherence to E. coli and staph. aureus.

Polyglycolic acid (Dexon) :- High affinity for adherence of E. coli and Staph. aureus.

Day's Req. to absorb Suture :-

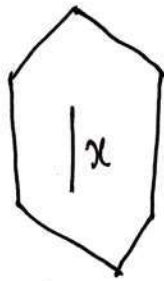
⇒ ① 60-90 day :- Catgut

② 90-120 day :- V :- Vicryl
C :- Chromic Catgut
D :- Dexon

③ 120 day :- Poly Glycaprone (Monocryl)

④ 180 day :- PDS.

①

 $4x : x = \text{Jenkin's Rule}$

Ratio of suture length to wound length

②



3:1 :- In Elliptical Incision :-

Length to width Ratio :- 3:1

③



Ratio of distance B/w suture to skin thickness :- 2:1

Skin thickness

④

 γ -EAR :- Length of End of suture :- S/b 1-2mm.

*) for vascular anastomosis :- Prolene is used.

* Thickness of suture :-

Que :- (i) for Aorta :- 4/0

(ii) for femoral artery :- 4/0

(iii) for popliteal to distal artery :- 6/0

(iv) for Microvascular anastomosis :- 10/0

Lesser the no. of suture
↓
More the thickness

) Tissue Glue :- Composition :- η -BUTYL-2-CYANOACRYLATE) Light wt. Mem :- $< 40 \text{ gm/m}^2$ *) Heavy wt. Mem :- $> 80 \text{ gm/m}^2$

- follow: $A > B > C > D > E$

Cardiac arrest follow
 $C > A > B$

- ATLS (2010) Protocol

↳ according to ATLS protocol Cervical injury is suspected in all the pts of Trauma. That's why

↓ 1st step

1st step: Cervical spine stabilization

↓

ABCDE

- Component of 1^o Survey:

A:- Airway & Cervical spine stabilization

Assess the patency of airway

→ If not patent →

Restore the patency by:

i) Chin lift

ii) jaw thrust

iii) Endotracheal intubation

in case of facial trauma: cricothyroidotomy is done for patency of airway

B:- Breathing (Oxygenation & Ventilation)

i) Assess the Respiratory Rate and depth

- Percussion

- Auscultation

- Saturation

- pulse Oximetry

In this R/O:-

i) Hemothorax

ii) pneumothorax

iii) Tension pneumothorax

if present → ICD insertion
intercostal drain

C:- Circulation & Haemorrhage control

- Control External Bleeding

- Assess vital:

PR > 100 unstable
BP < 100 vital

→ suspect significant External Bleeding or Internal Bleeding

(P.T.O.)

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② Send Blood for cross match
③ Start DVF
④ for Non-Responding pt:- Blood Transfusion start

According to Trauma Transfusion Protocol Ratio of packed cell, plasma and platelet:- 1:1:1



D:- Disability Limita?

GCS $\xrightarrow[\text{than do check}]{\text{not possible}}$ Pupil:- Size, Equality and React?



E:- Exposure & Hypothermia Preven?

* Secondary Survey:- Detailed Head to Toe Examⁿ to R/O non-life threatening inferⁿ & injury.

Step 1:- Examⁿ of Head & face:-
- R/O fracture & laceratⁿ

Step 2:- Examⁿ of Neck:- R/O Neck injury.

" 3:- " " Chest:- look for ~~Examⁿ~~ External Sign of injury

- o Bruise
- o R/O Rib#

" 4:- Examⁿ of Abdomen:- look of External sign of injury
Bruise

- o R/O intra abdominal organ injury
- o Insert N-G Tube

* In case of facial Trauma $\rightarrow$ Insert ~~Examⁿ~~ Oro-gastric Tube
o Examine the Meatus and look for presence of Blood @ the Meatus

Step ⑤ :- Examinaⁿ of Back :- KIA LOG ROLL

1) 5 people are required for Examinaⁿ of back

① → Supporting Head

② → " Body

③ → Examinaⁿ

* DRE is performed during examiⁿ of back

Step ⑥ Examinaⁿ of Extremities :-

1) Look for deformity, abⁿ movement and crepitous.

2) R/O fracture.

Step ⑦ Repeat Neurological Examinaⁿ :-

- Repeat GCS

- Look for sign and symptoms of spinal cord injury.

- Look for localizing sign or lateralizing sign.

→ TRAUMA SCORING SYSTEM :-

① Revised Trauma Score (RTS)

Mn:-

① G :- GCS

② B :- BP :- systolic

③ R :- Respiratory Rate

② TRISS

Trauma and Injury Severity Score

ISS + RAM

↓
② RTS
↓
① Injury Severity Score

↓
③ Age

↓
④ Mechanism

③ MESS⁹

Mangled Extremity Severity Score

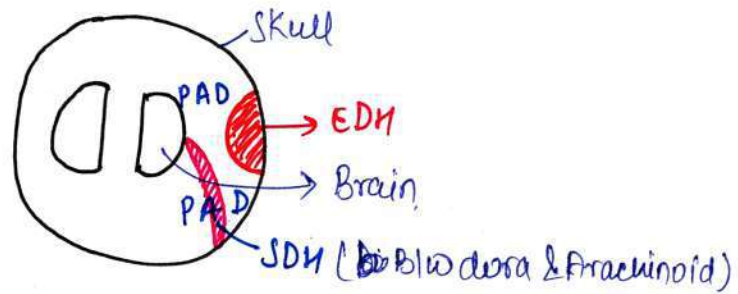
Mn:-

E :- Energy

L :- Limb Ischemia

S :- Shock

A :- Age



EDH (Arterial Bleed)

-) Collecⁿ of blood occur b/w skull and dura
-) Caused by Trivial Trauma (non-significant)
-) in ^{Anterior} ~~Posterior~~
-) Injury to Middle Meningeal Artery
-) Lucid Interval +ve (Unconscious → conscious → unconscious)
-) DOC :- NECT



Lenticular BURR HOLE

SDH

-) Collecⁿ of Blood B/w dura and Arachnoid.
-) MC in Elder
-) Caused by significant trauma
-) Occur d/t injury of Cortical Vein
-) DOC :- NECT



Concavo-convex

Rx :- Drainage by Craniotomy.

* Poor Prognosis.

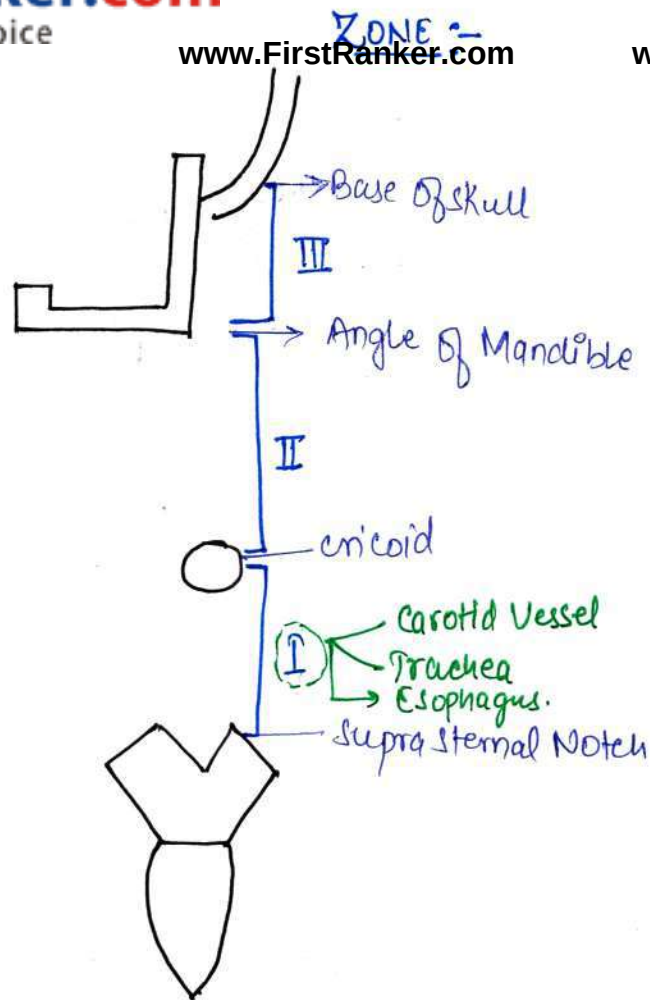
NECK Injury :-

- 2 most imp landmarks :-

- ① Platysma
- ② Sternocleidomastoid.

- Zone in Neck injury.

P.T.O.



* Zone I :- FATAL

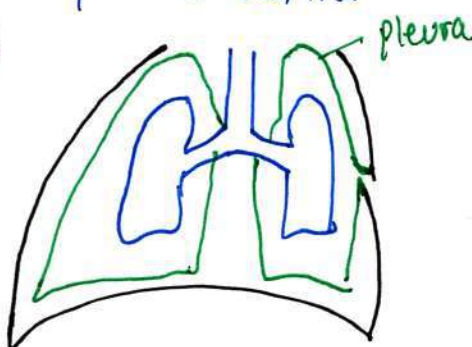
AIMS

③ THORACIC INJURY

① TENSION PNEUMOTHORAX

Caused by formaⁿ of Unidirectional Valve (or) Air Sucking Wound

- cause :-
- ① penetrating trauma
 - ② Blunt Trauma
 - ③ Central Line Trauma
 - ④ Positive pressure Ventilaⁿ.



diff: - dyspnea
1) Tachypnea

O/E :- 1) Distended Neck Vein.

On percussion :- Hyper Resonance

On Auscultation :- Absent breath sound over affected Hemithorax.

IOC :- Purely clinical on the basis of suspicion.

CXR
CXR

- Put large Bore Needle in 2nd ICS in Mid Clavicular Line

R :- TCC :- TCC insertion in Triangle of safety in 5th ICS in Anterior Axillary Line

Δ of safety Boundaries :-

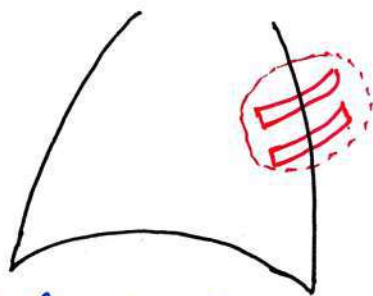
Anterior :- pectoralis Major

Posterior :- latissimus dorsi

Inferior :- 6th Rib.

* FLAIL CHEST :-

defⁿ :- fracture of 2 or >2 consecutive Rib @ 2 or >2 places.



- aka Paradoxical Respiraⁿ.

- also ↑ Risk of Respiratory failure due to ① Painful Respiraⁿ

② Paradoxical Respiraⁿ

③ Shallow Respiraⁿ

④ ↑ Work of Respiraⁿ

CXR
CXR

- Dx is clinical

- Ask the pt to cough ⑤ ~~observe~~ Observe the pt for multiple Respiratory cycle.

flail chest + Respiratory failure:- Intermittent PPV.

BLUNT TRAUMA ABDOMEN

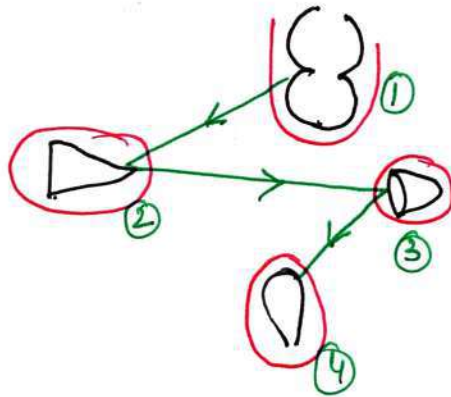
- 1) MC injured organ:- Spleen > Liver
- 2) MC Injured Bowel in Blunt Trauma Abd:- Jejunum.
- 3) MC injured in penetrating Trauma:- SI > Colon > LIVER.

1st FAST :- Focused Assessment ^{by} Sonography for Trauma.

- 1) SLb performed in 2-4 min
- 2) 4P's are assessed:-

Sequence:-

- 1- pericardium
- 2- perihepatic
- 3- perispleen
- 4- pelvis

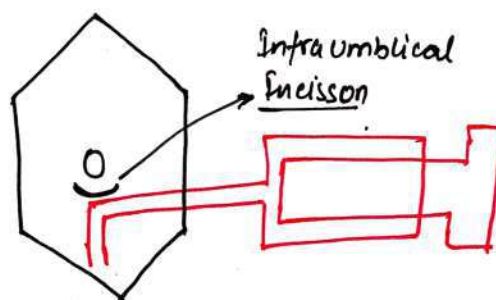


- 1) Fast has Replaced DPL (Diagnostic Peritoneal Lavage)
- 2) 1st Lx done in pt. of Blunt Trauma abd:- FAST.

* e-FAST :- Extended -FAST

↳ see - Pleura → STRATOSPHERE SIGN seen in pneumothorax.

* Positive FAST :- Means Bleeding / perfora?

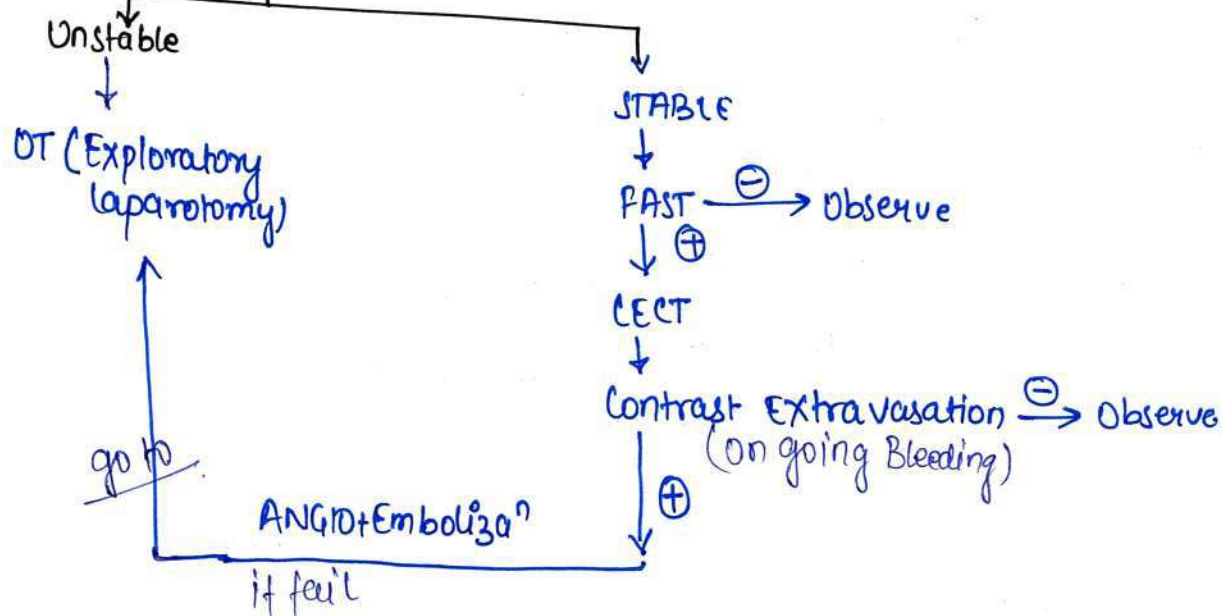


* DPL is considered +ve if $>10\text{ml}$ of frank Blood aspirated or

(aspirated) Effluent ~~contains~~ contains:-

- ① RBC $>1\text{lac}/\text{mm}^3$
- ② WBC $>500/\text{mm}^3$
- ③ presence of Bile, Bacteria, fecal matter, Vegetable matter

Mx of Blunt Trauma :-



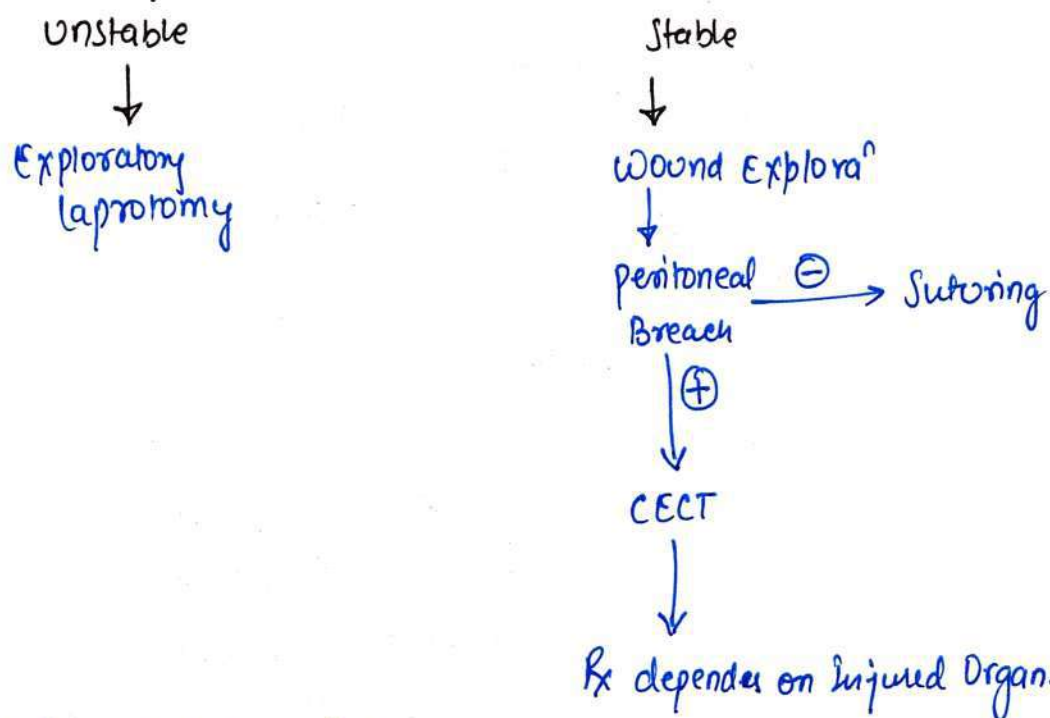
* PENETRATING TRAUMA:-

2 types :-

Gun shot

Stab injury

* Laprotomy is mandatory in Gunshot ∵ of ↑ risk of intra abdominal Organ injuries.



⊖ protruding Omentum is suggestive of Peritoneal Breach CECT s/b performed to R/O intra abdominal organ injury

PGI * LETHAL TRAUMA TRIAD :-

- ① Hypothermia
 - ② Coagulopathy
 - ③ Metabolic acidosis
- These three components are linked by arrows to 'Halt's coagulaⁿ' and 'lactic acidosis'. An arrow from 'Metabolic acidosis' points down to the text 'have depressant action on Myocardium'.

* Damage Control Surgery :-

- aka Abbreviated Laprotomy.

- 3 phase :-

phase ①

• Initial Exploration

→ Control H₂age & contamination?

Phase 2

• Secondary Resuscitaⁿ

→ shift the pt to ICU for 48 hr for resuscitaⁿ
- correct Hypothermia
Coagulopathy

phase 3

• Definitive Operaⁿ
performed after Resuscitaⁿ.

- avoid complex anastomosis
- Stoma formaⁿ is preferred.

ABDOMINAL COMPARTMENT SYND

- (N) intra abd. pressure: 5-7 mmHg
- Intra abd. HIN: pressure $\geq$ 12 mmHg
- Abd. compartment Synd: $\uparrow$ intra abd. pressure leading to compression of intra abd. organ $\rightarrow$ can cause fatal complica? dlt Respiratory failure (or) Mesenteric Vascular compromised.

Mech: $\downarrow$ Venous Return $\rightarrow \downarrow$ CO $\rightarrow \downarrow$ Renal Blood flow $\rightarrow \downarrow$ GFR $\rightarrow \downarrow$ Urine output.
 $\downarrow$ Visceral Blood flow

- Mn: $\uparrow$ PICS: $\rightarrow$ Peak Inspiratory pressure $\uparrow$
 - PCWP (pulmonary Capillary Wedge pressure) $\uparrow$
 - Intra - Pleural pressure $\uparrow$
 - Cardiac Rate (HR) $\uparrow$
 - Systemic Vascular Resistance $\uparrow$
- ~~Bladder~~ Intra abd. pressure is measured by Bladder Catheter.

Q. Grading of Abd. compartment Synd:-

Grade I: 12-15 mmHg	None	Rx.
II: 16-20 mmHg	oliguria, splanchnic hypoperfusion	Normovolemic Resuscitation
III: 21-25 mm	Anuria, $\uparrow$ ventila ⁿ pressure	Hypovolemic Resuscitation
>25 mm	Anuria, $\uparrow$ ventila ⁿ pressure + $\downarrow$ PO ₂	Decompression
		Emergency Reexplora?

- To prevent Abd. compartment Synd: - Abd. is close $\bar{e}$ the use of BOGOTA BAG



BE FAN OF VEINS

Bone

Extensor Tendon

Flexor Tendon

Artery

Nerve

Vein

SKin

* MC Salivary Gland Neoplasm:- pleomorphic Adenoma

* MC Malignant Salivary Gland Neoplasm:- Mucoepidermoid Ca.

* MC Benign Salivary Gland Tu. in children:- Hemangioma

* MC Minor Salivary Gland Tu. :- Adenoid cystic Ca.

Q:- Most of Salivary Gland Tu. are MC in female except Warthin Tu. & is MC in male

Q:- Most Salivary Gland Tu. are MC located in parotid. except Adenoid cystic Ca.

eg:- Pleomorphic Adenoma

Mucoepidermoid Ca.

Acinic Cell Ca.

Warthin Tu.

Salivary Gland Lymphoma

Metastasis. -(MC in Parotid)

* Loc for Most of Salivary Gland Tu. :- FNAC

* Loc for Staging of Salivary Gland Tu:- MRI

1) Mc Brain Tu:- Metastasis

Mc 1° Brain Tu:- Meningioma > Glioma

Mc Malignant Brain Tu. in children:- Medulloblastoma.

Mc Astrocytoma in children:- ~~Pilo~~ Pilocytic astrocytoma Best prognosis.

" " " Adult:- Glioblastoma Multiform. Worst prognosis

Astrocytoma:-

Best prognosis:- Pilocytic

