
بسم الله الرحمن الرحيم

EXTRAHEPATIC BILIARY APPARATUS

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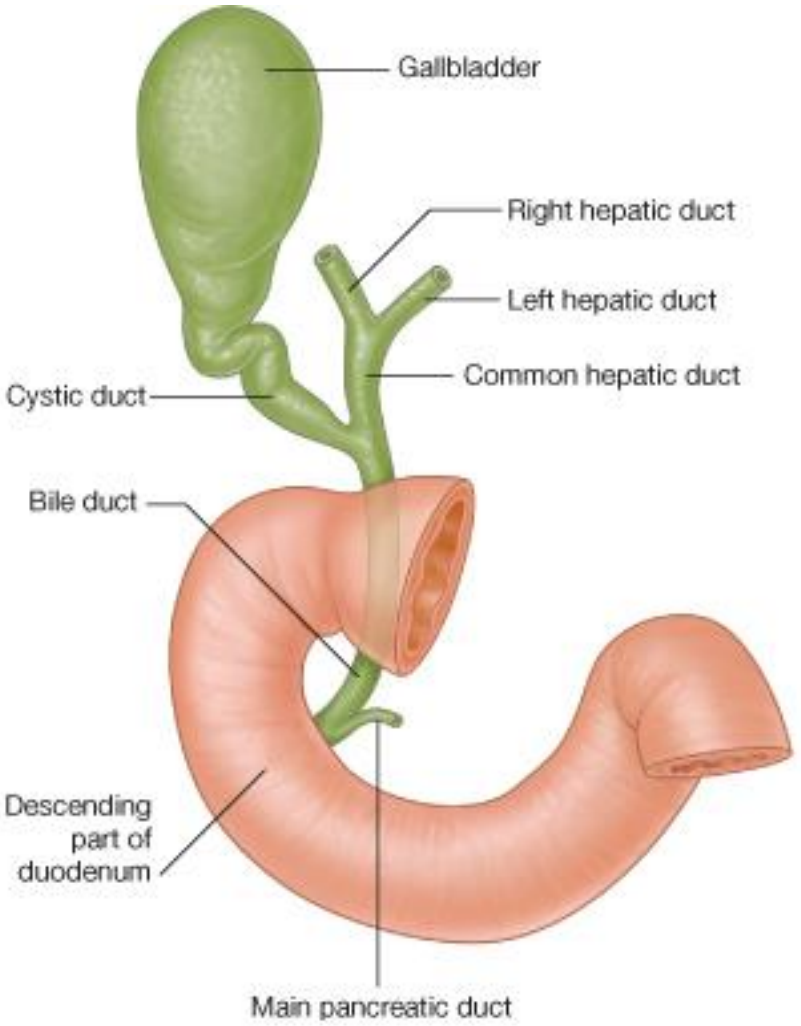
APPARATUS

Consists of

- Left and right hepatic du
- Common hepatic duct
- Gallbladder
- Cystic duct
- Common bile duct



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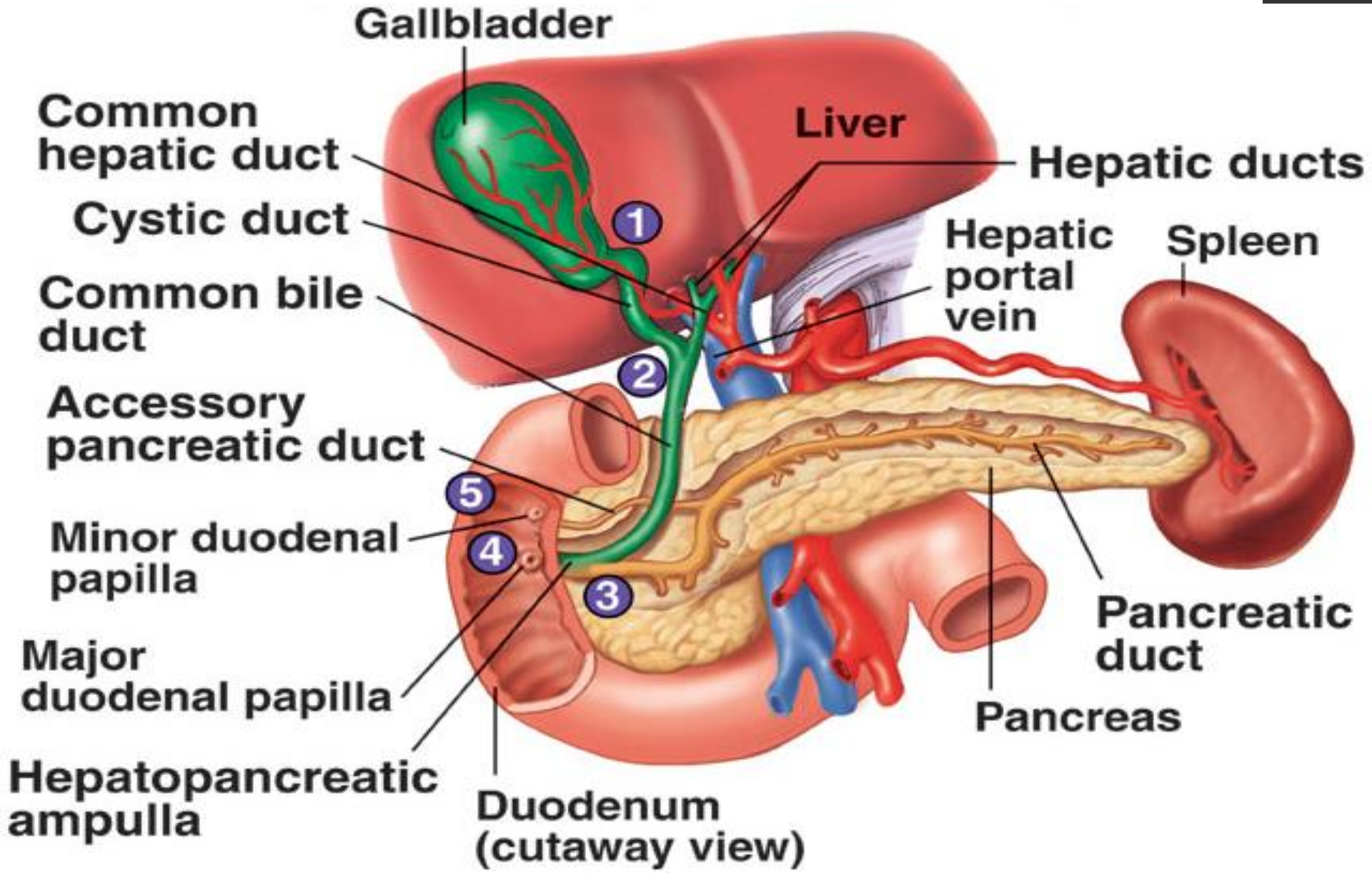

Gallbladder
Common hepatic duct
Liver
Hepatic ducts
Cystic duct
1
Hepatic portal vein
Spleen
Common bile duct
2
Accessory pancreatic duct
5
Minor duodenal papilla
4
3
Pancreatic duct
Major duodenal papilla
Pancreas
Hepatopancreatic ampulla
Duodenum (cutaway view)

FUNCTIONS

- COLLECTS BILE

  FROM LIVER

- STORES

  IN GALL BLADDER

- TRANSMITS

  TO 2ND PART OF DUODENUM

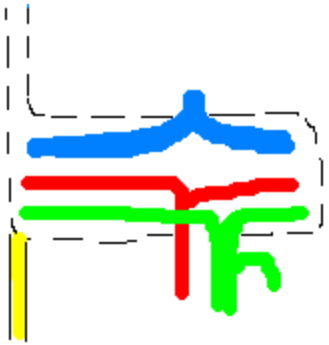
Hepatic ducts

- Right & left
- Porta hepatis-emergence
- Behind forwards:

✓ Portal vein

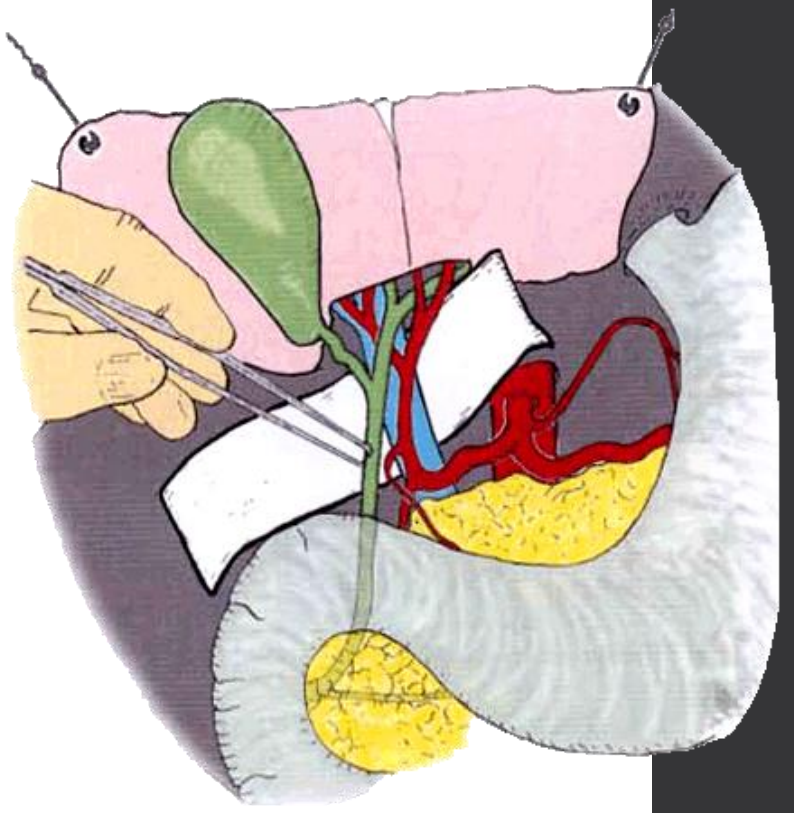
✓ Hepatic artery

✓ Bile duct



Common hepatic duct

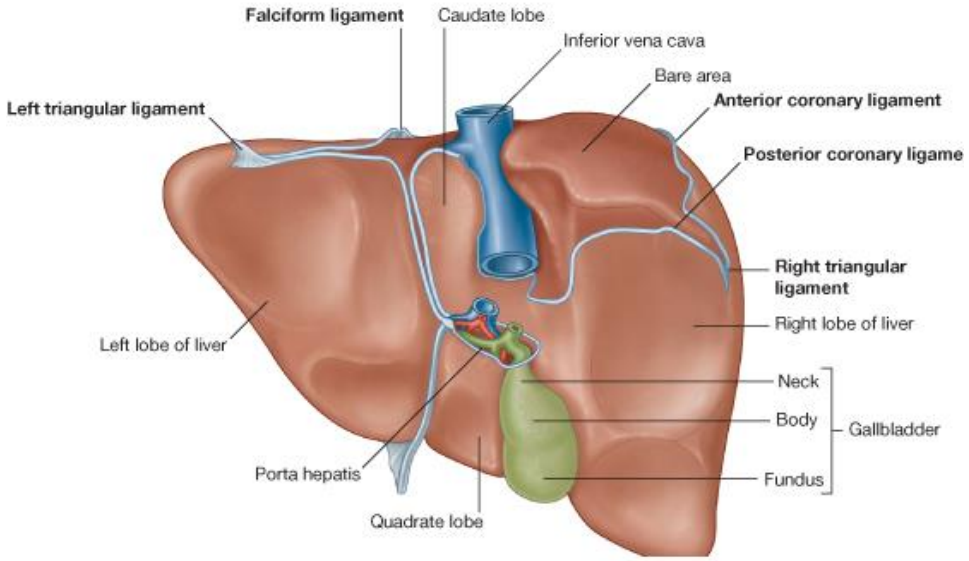
- Right & left hepatic ducts
- Right end of porta hepatis
- 3cm
- +cystic duct(right)=bile duct



THE GALLBLADDER

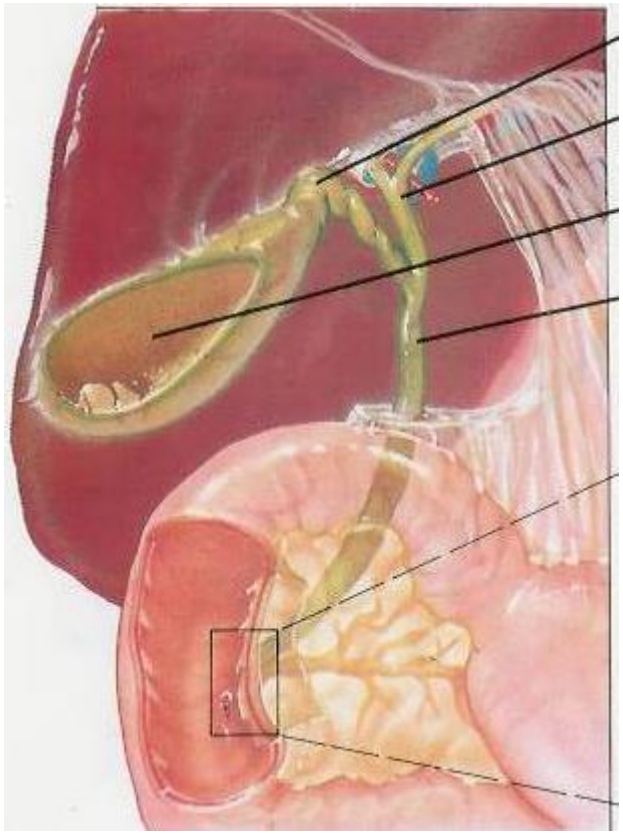
Gall bladder

- Pear-shaped, hollow structure
- situated in fossa for gall bladder
- On inferior surface of liver
- Extending from right end of porta hepatis to inferior border of liver



Measurements:

- 7-10 cm long
- ~ 3 cm diameter
- 30 – 50 cc volume

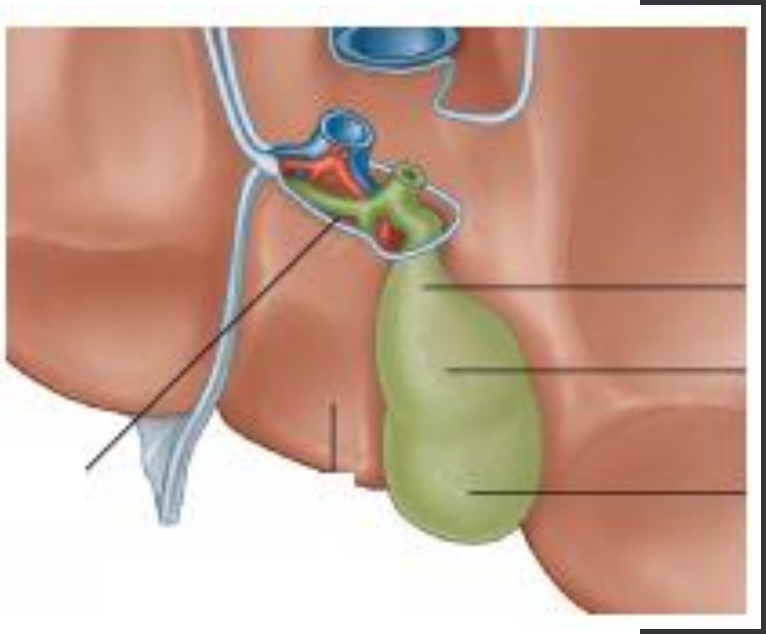


Parts

3 parts

- **Fundus of gallbladder**

  Surface projection: at the junction of right midclavicular line and right costal arch



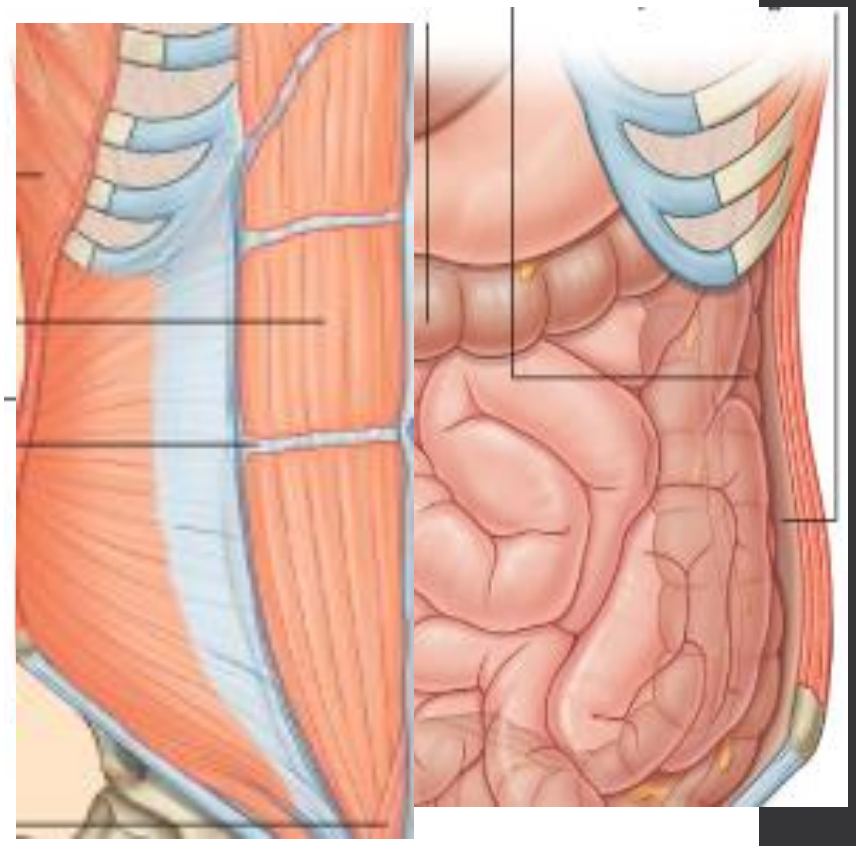
- **Body of gallbladder**

- **Neck of gallbladder**

  Narrow upper end

Fundus of GB:

- may be palpated in angle between lateral border of right rectus abdominis and 9th costal margin
- surrounded by peritoneum
- Anteriorly – ant abdominal wall
- Posteriorly – transverse colon

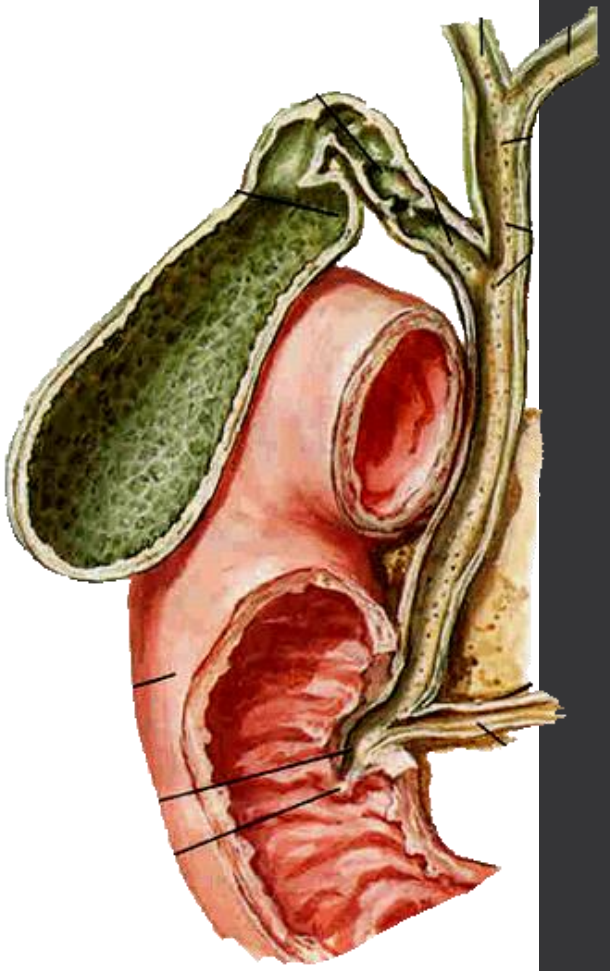


Body of Gallbladder

- Lies in gall bladder fossa
- Upper end continous with neck at right end of porta hepatis
- Superior surface devoid of peritoneum
- Inferior surface covered with peritoneum
- related to transverse colon & duodenum

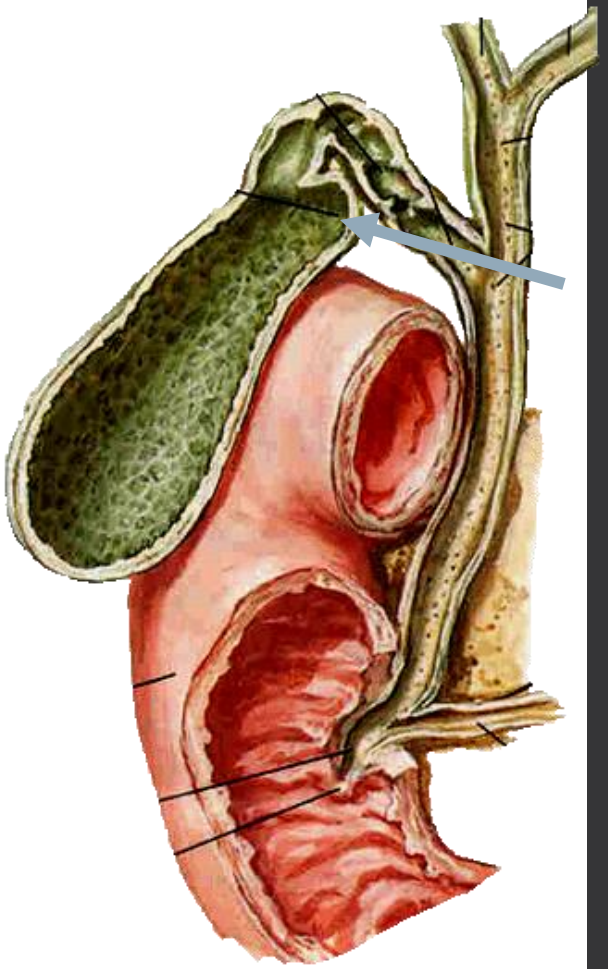
Neck

- Situated near right end of porta hepatis
- Antero-superiorly→postero-inferiorly
- continuous with cystic duct (constriction)
- Attached to liver by loose (areolar) connective tissue –cystic vessels
- Inferiorly – 1st part of duodenum
- Mucous membrane-folded spirally



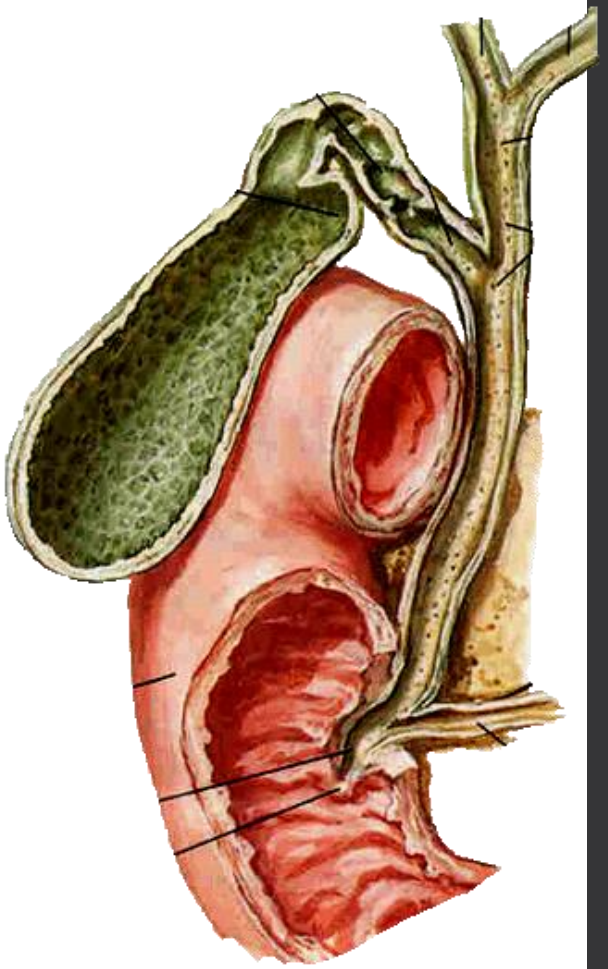
Hartmann’s pouch

- Dilated posteromedial wall of neck
- Directed downwards and backwards
- Normal variation
- *Gall stones may lodge in it - pathological*



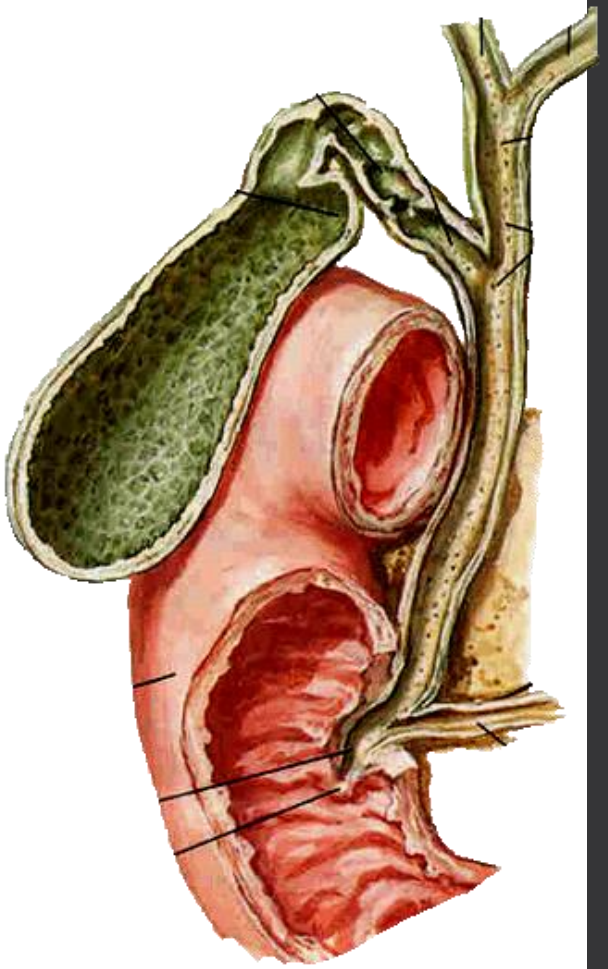
Cystic duct

- 3-4cm long
- Extends from neck of gallbladder to common hepatic duct
- Joins with common hepatic duct inferior to porta hepatis
- Downwards, backwards, to left
- superior and posterior to pylorus of stomach
- Spiral valve may extend into neck of gallbladder: 5-12 cresecentic folds



Bile duct

- Formed by union of cystic and common hepatic duct
- 7.5 cm long
- Narrow tube, 6 mm diameter



COURSE

- Downwards & backwards
- Deep to pyloric sphincter
- 3 parts

  SUPRADUODENAL:

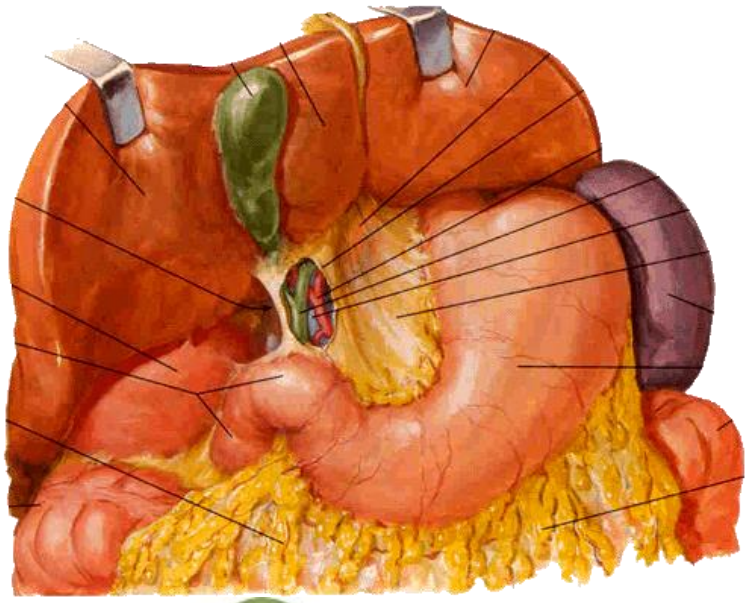
  through lesser omentum

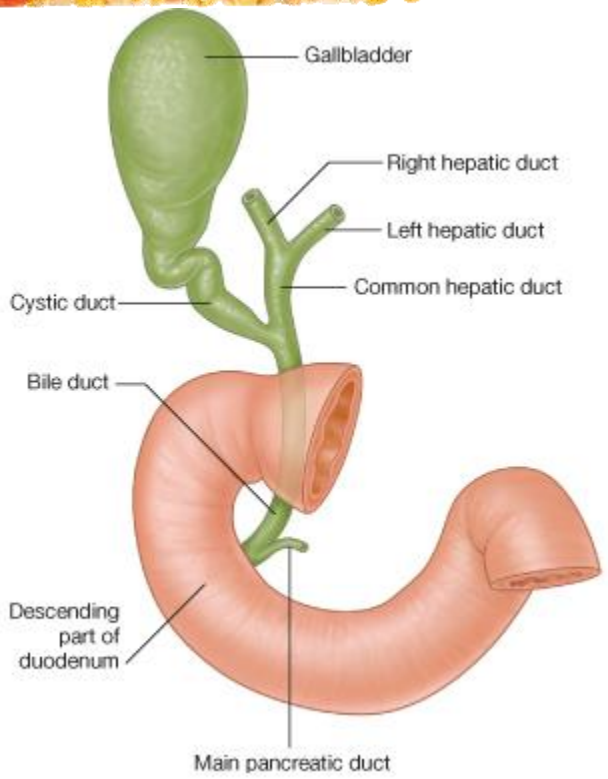
  RETRODUODENAL:

  behind 1st part of duodenum

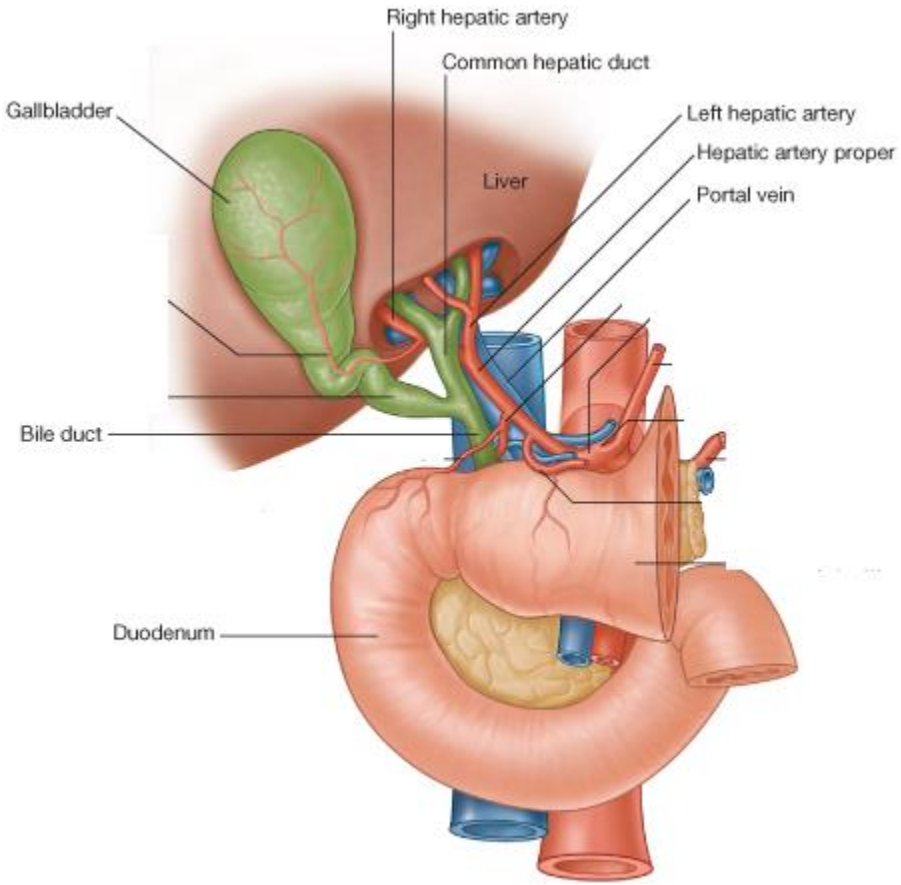
  INFRADUODENAL:

  behind /embedded in head of pancreas

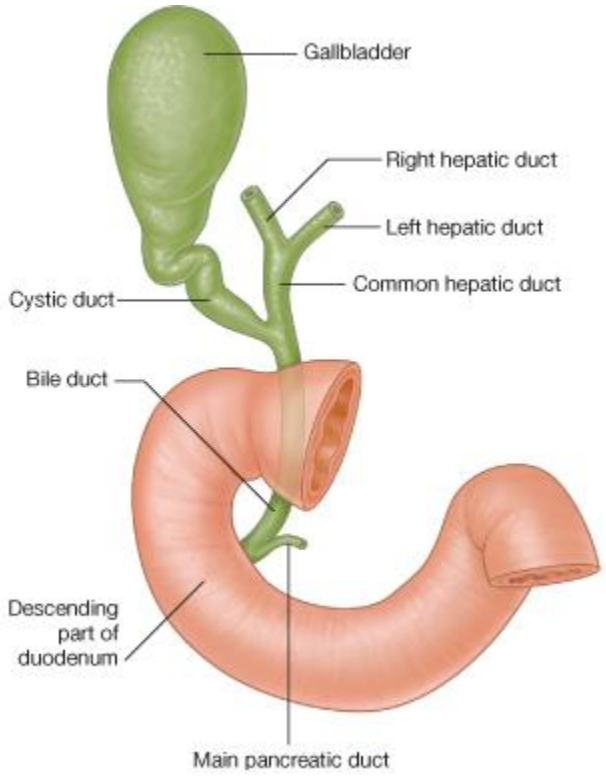


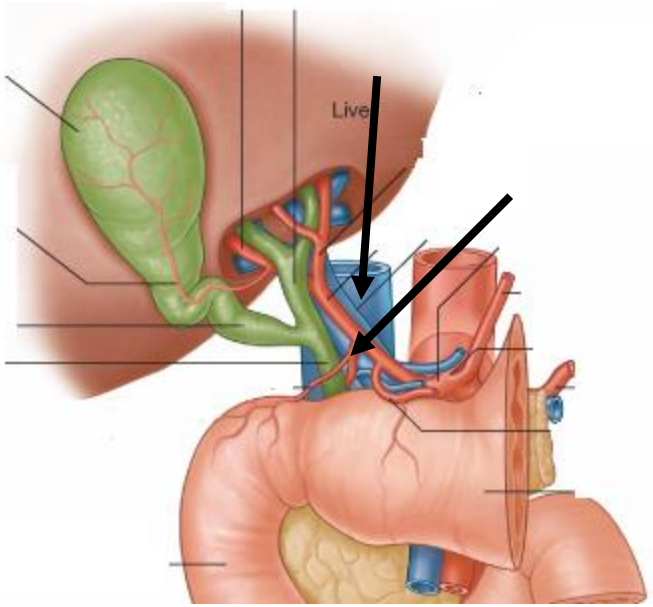


Supraduodenal part

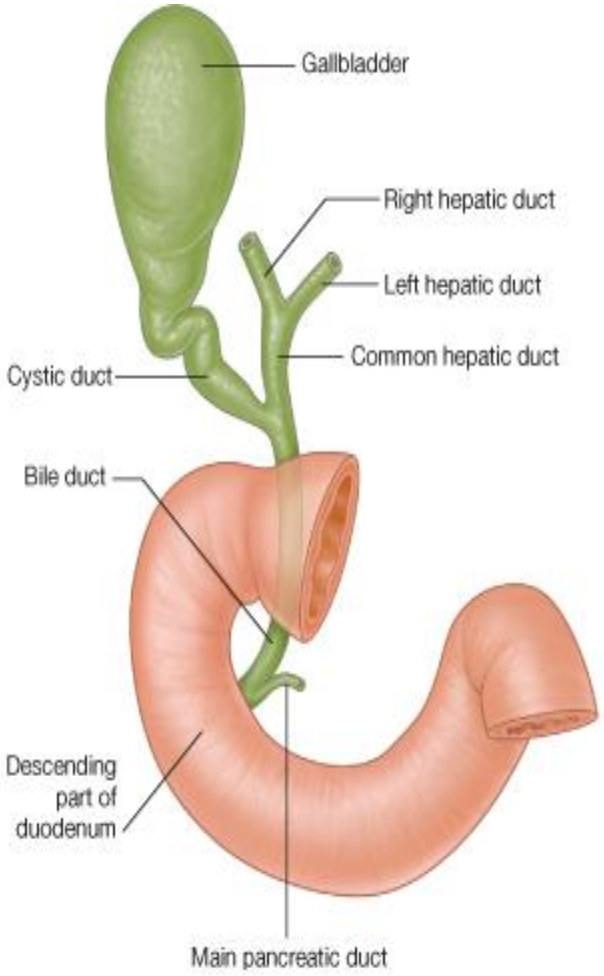


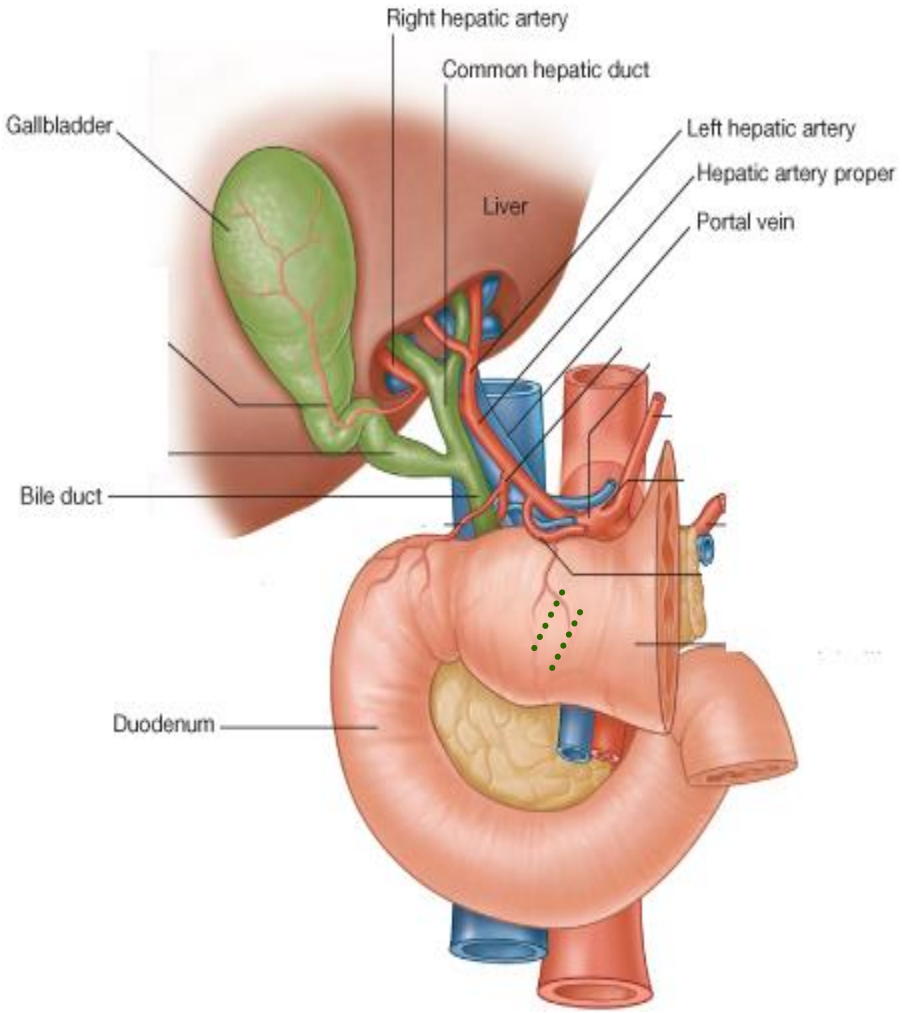
Retorduodenal part





INFRADUODENAL PART

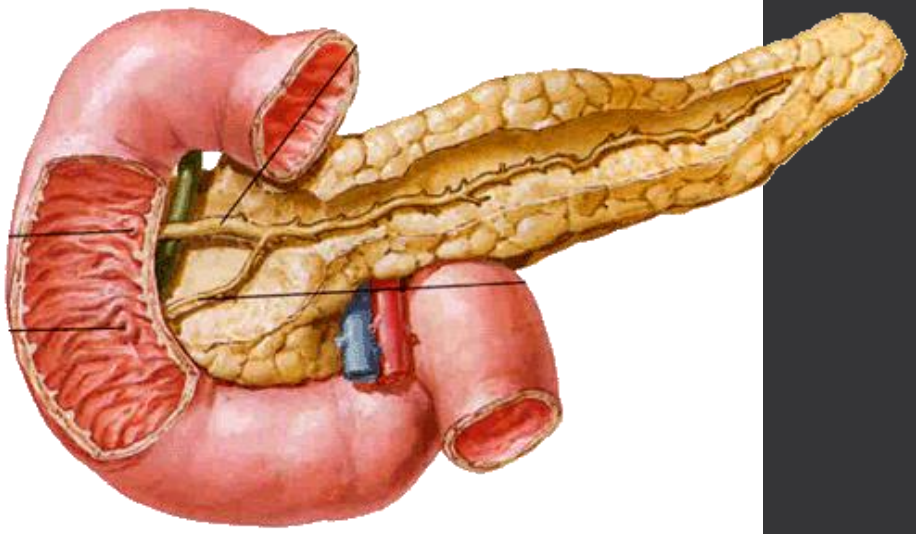


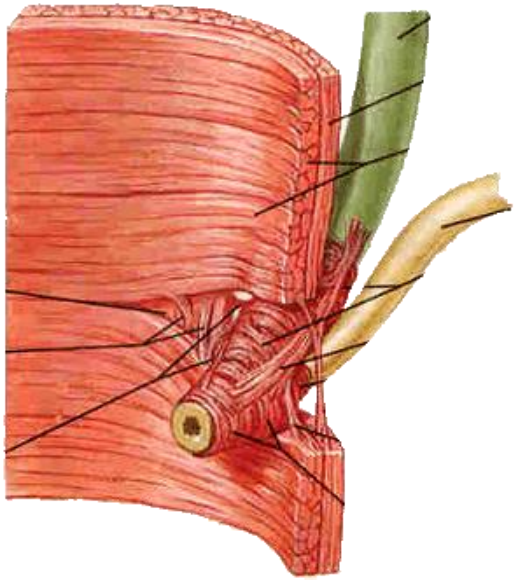


Intraduodenal segment

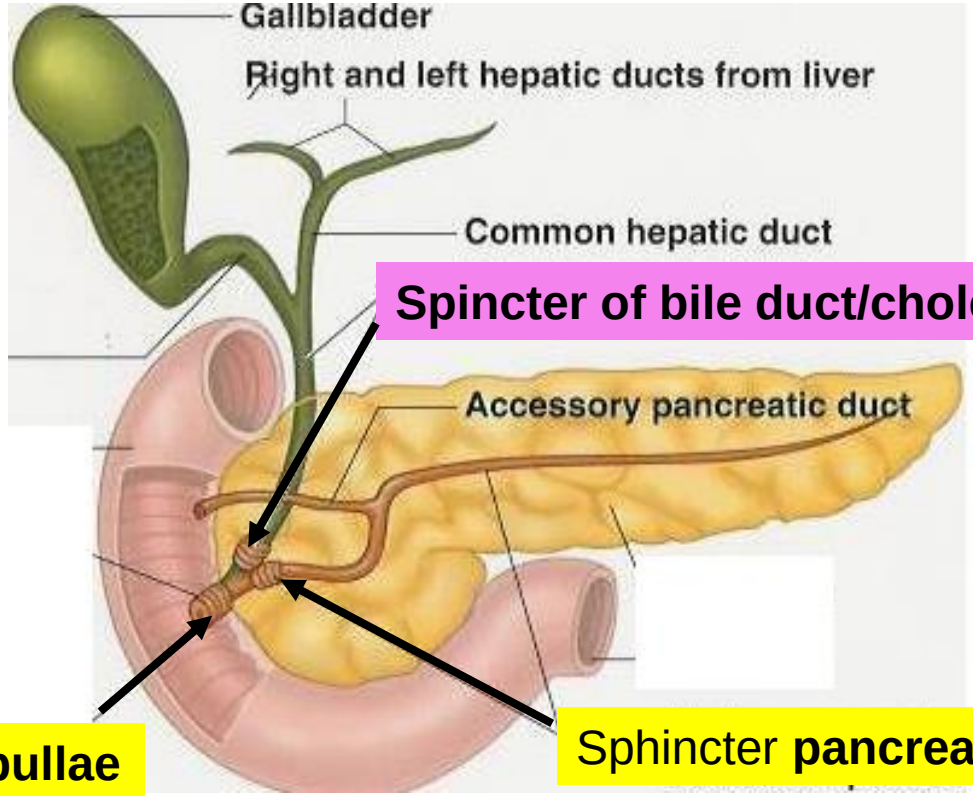
- Enters the wall of descending part of duodenum obliquely where joins the pancreatic duct to form the **hepatopancreatic ampulla /Ampulla of Vater**

- opens at the major duodenal papilla 8-10cm distal to pylorus





Sphincter of **Oddi**

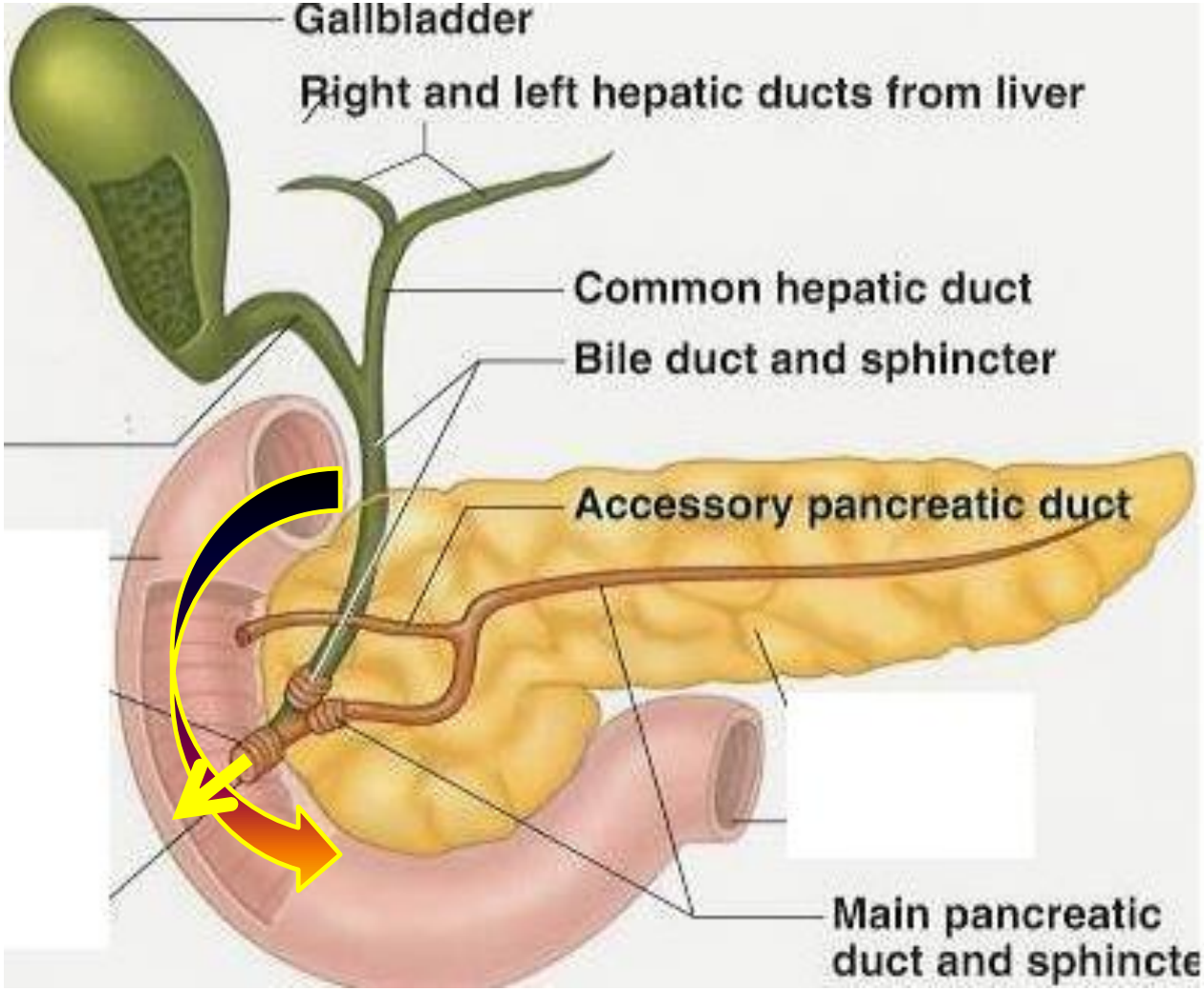


Spincter of bile duct/choledochus /Boyden

Sphincter of **ampullae**

Sphincter **pancreaticus**

Sphincter of **Oddi**

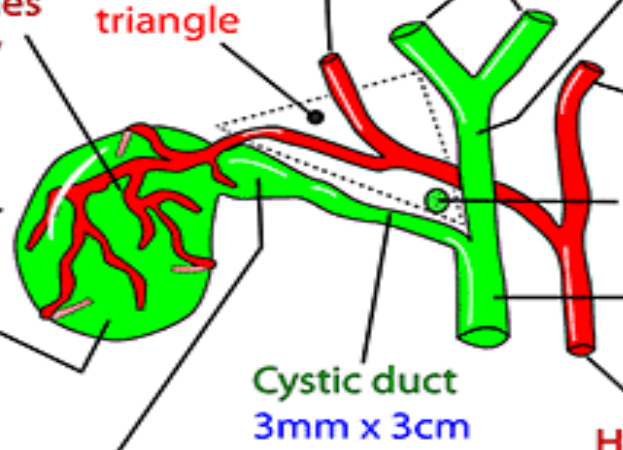


BILIARY TREE - GENERAL TOPOGRAPHY

GALL BLADDER

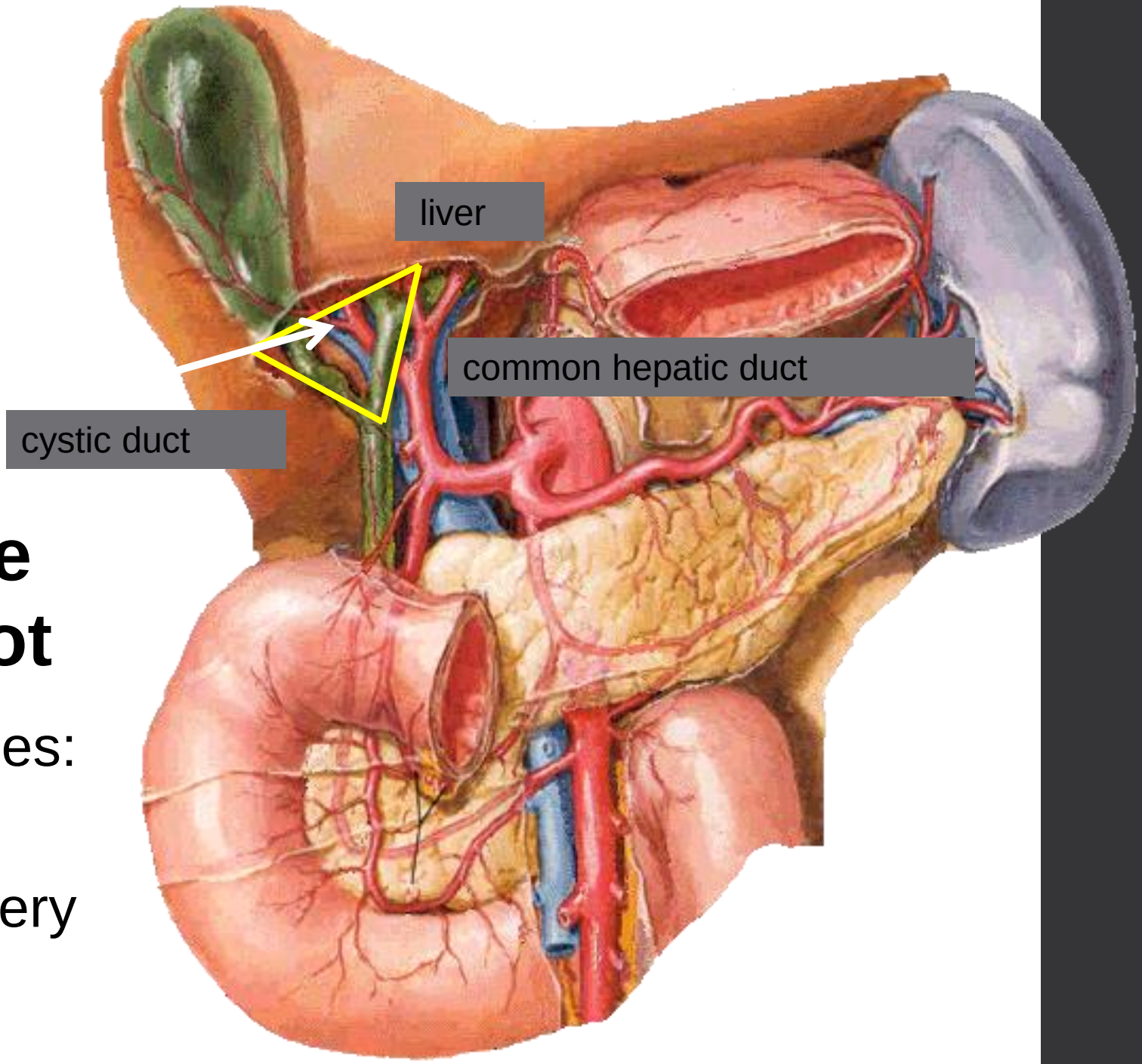
- Fibromuscular sac - stores & concentrates bile. Holds 50ml
- Lined by simple columnar epithelium. Mucous cells at neck only
- Veins directly to liver bed then to hepatic veins. Occasionally join the portal vein
- Lymphatics to porta hepatis
- Parasympathetics & sympathetics (see liver)
- Anterior: liver and abdominal wall
- Posterior: transverse colon & 1st part of duodenum

BILIARY DUCTS



Neck with mucous cells leading to mucosal folds giving the spiral valve of Heister. When there is a swelling like this it is called Hartmann's pouch, usually formed by the presence, or previous presence of a stone

Hepatic artery - note that there are a few small arteries from bed of liver therefore there is usually no gangrene when cystic artery thromboses

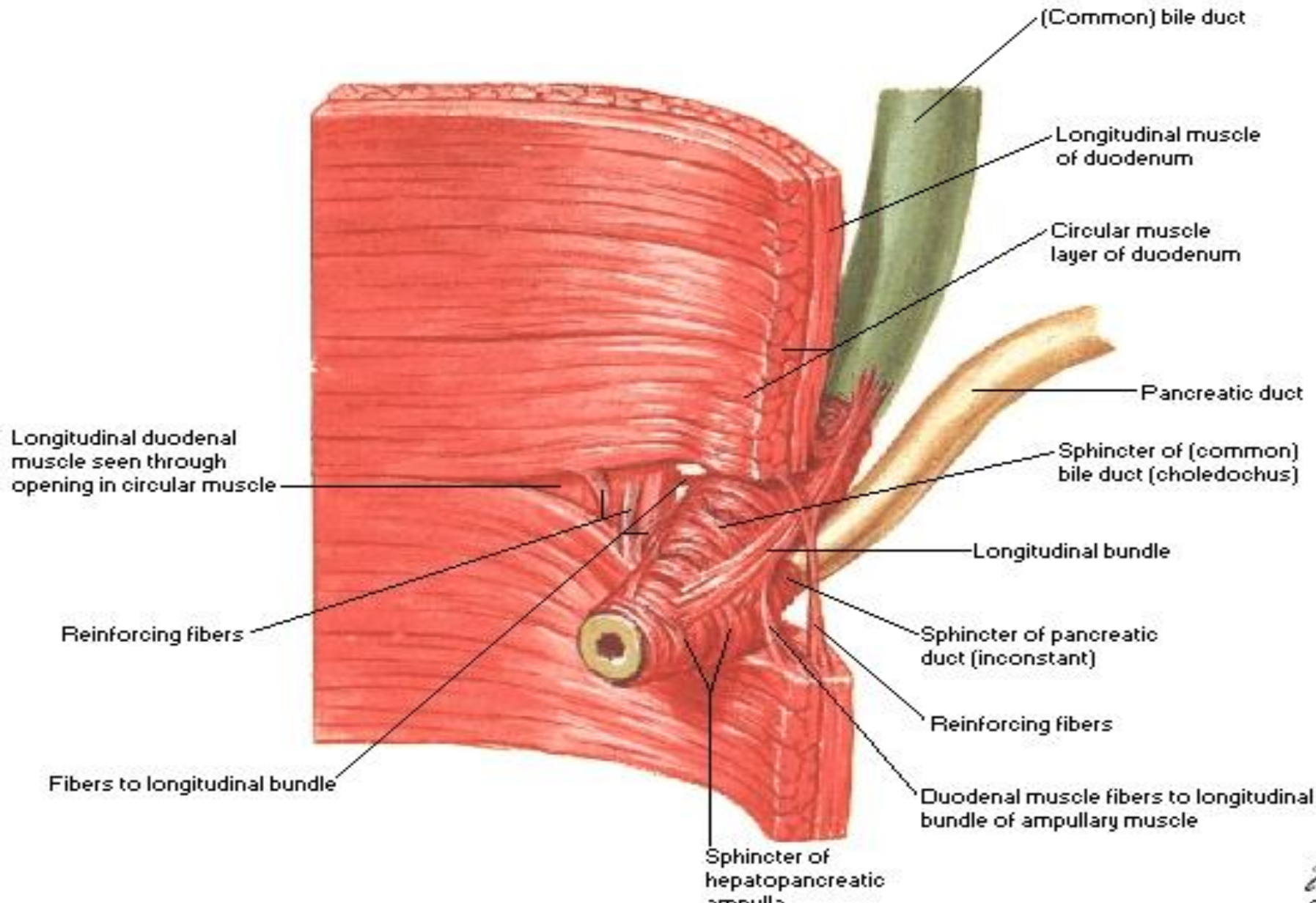


Triangle of Calot

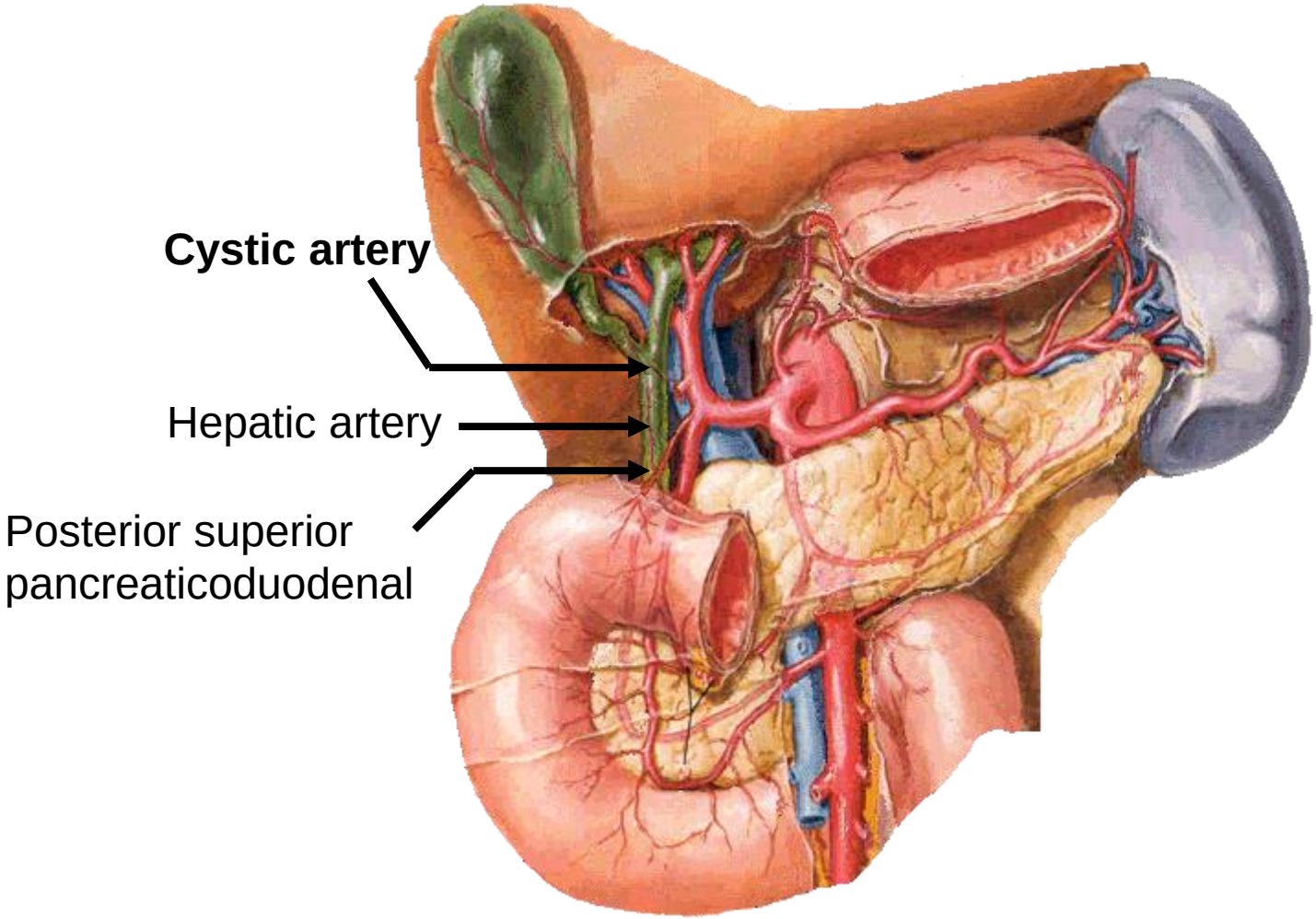
- Boundaries:
- Content: cystic artery

Junction of Bile Duct and Duodenum

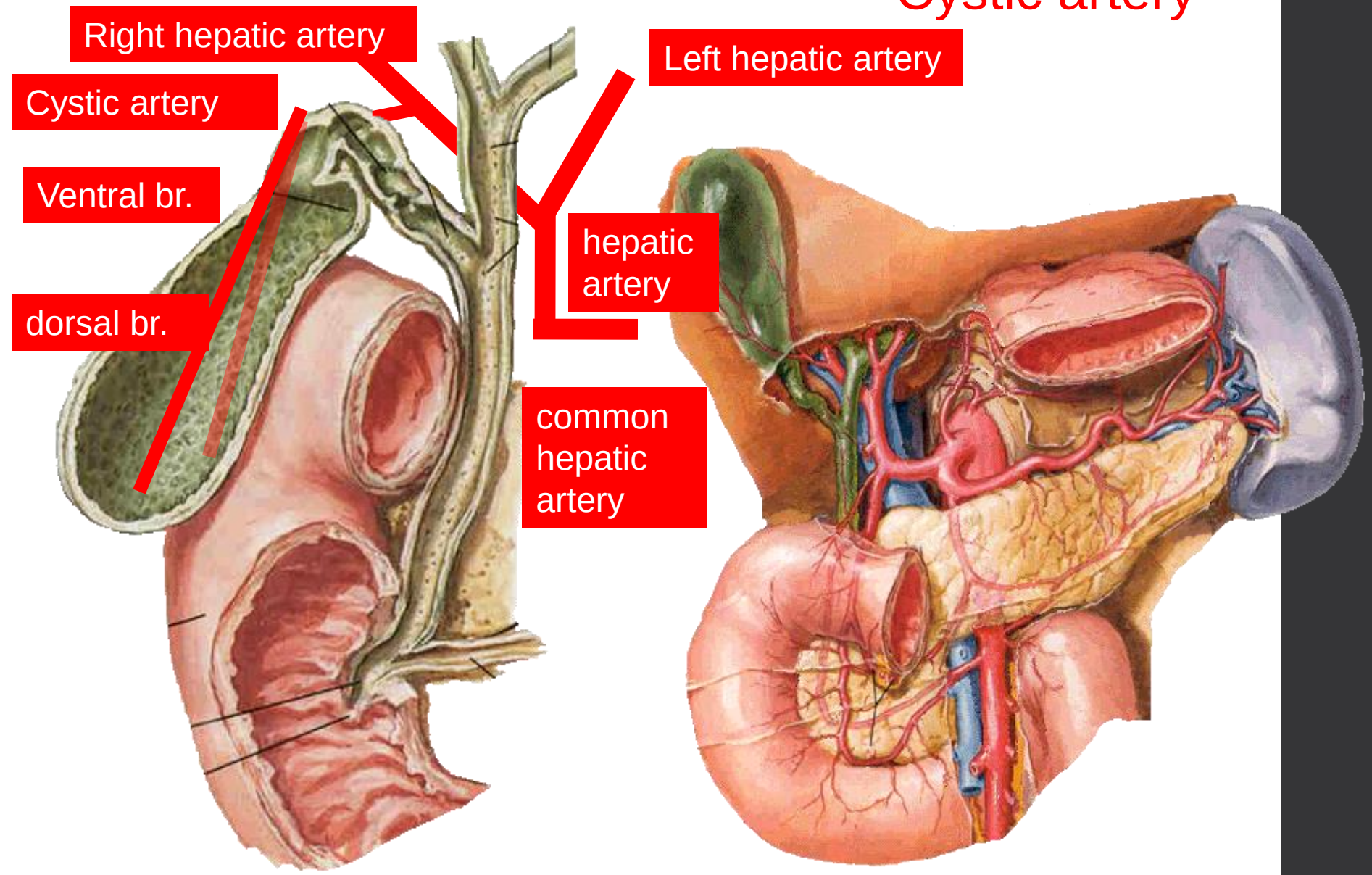
Dissection



BLOOD SUPPLY OF BILE DUCT:

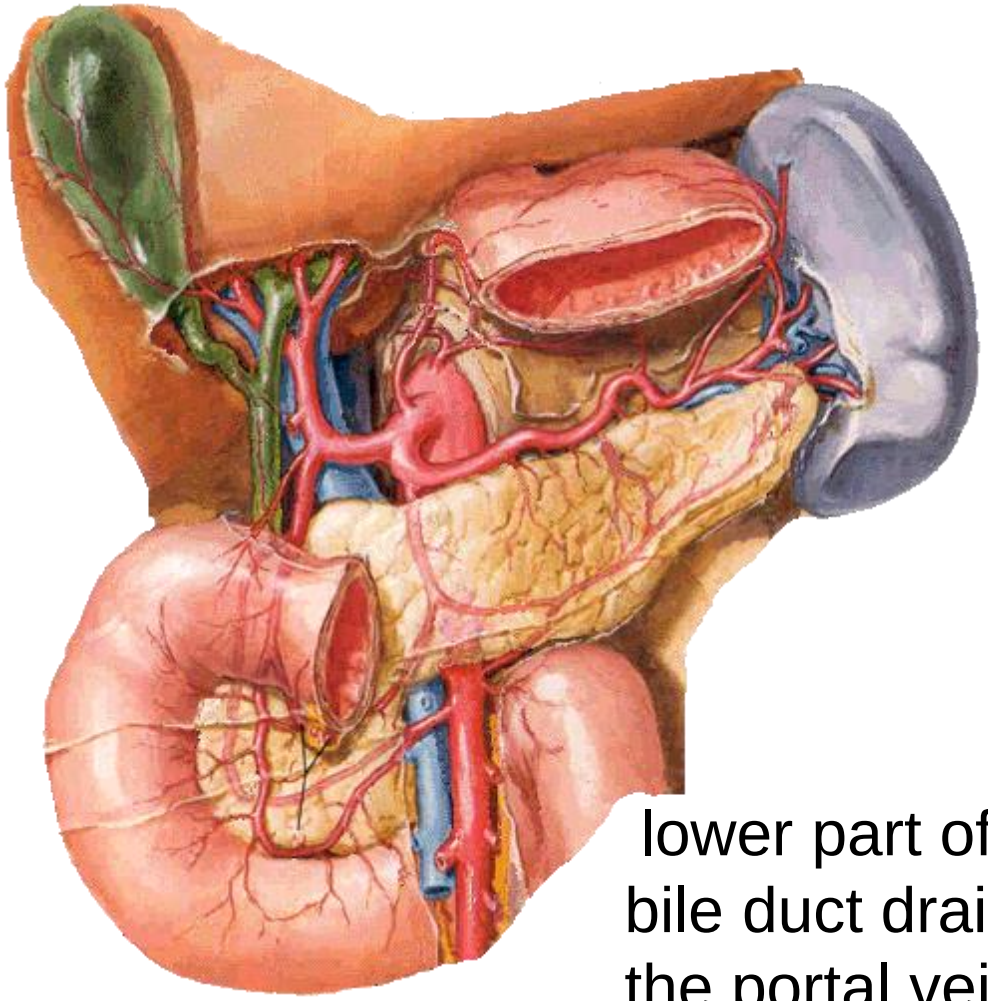


Cystic artery



Venous drainage

Superior surface of gall bladder drains veins entering through liver into the hepatic veins.



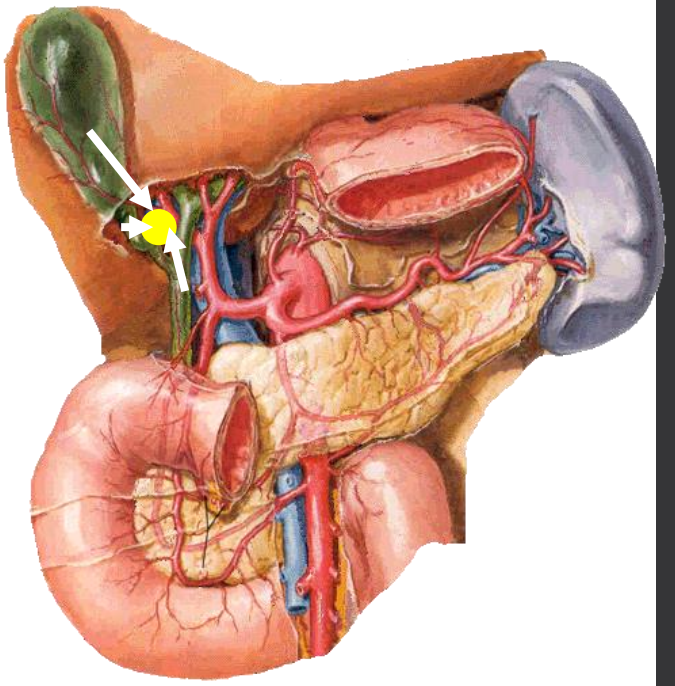
Rest of gall bladder-cystic veins

lower part of the bile duct drains into the portal vein.

LYMPHATIC DRAINAGE

- Lymphatics from the gall bladder cystic duct, hepatic duct and upper part of the bile duct pass to the cystic node , these are the most constant members of the upper hepatic nodes.

- The lower part of the bile duct drains into the lower hepatic and the upper pancreaticosplenic nodes.



Nerve supply

- Sympathetic and parasympathetic from celiac plexus
- Parasympathetic ---- vagous nerve
- Hormone →cholecystokini → duodenum

NERVE SUPPLY

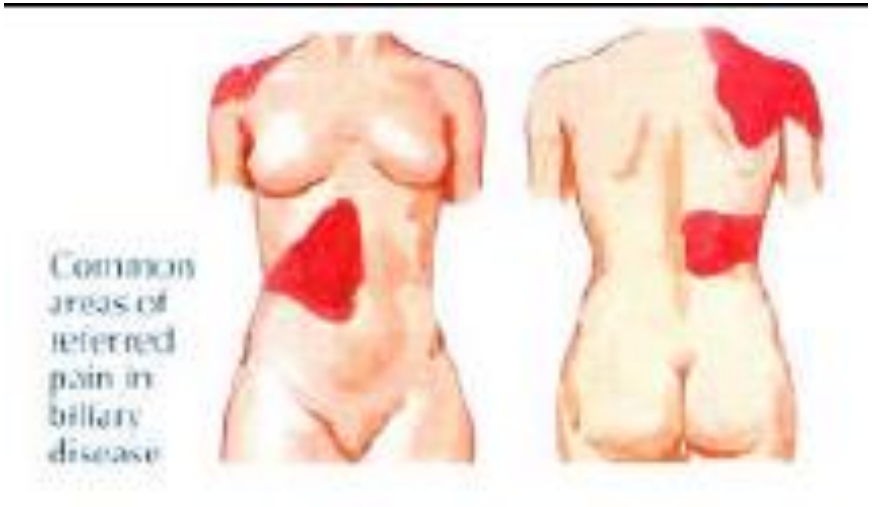
The celiac plexus of nerves, through sympathetic and parasympathetic nerves fibers .

derived from the hepatic plexus, which receives fibres from

coeliac plexus,
left and right vagus
right phrenic nerves.

The nerve plexus supplies the lower part of the bile duct over the superior pancreaticoduodenal artery.

NERVE SUPPLY



Parasympathetic nerves are motor to musculature of the gall bladder and bile ducts, but inhibitory to the sphincters of the bile duct.

Gall bladder pain via vagus is referred to stomach.

Sympathetic nerves (T 7-9) are vasomotor and motor to sphincters. Pain via sympathetic nerves is referred to the inferior angle of the scapula.

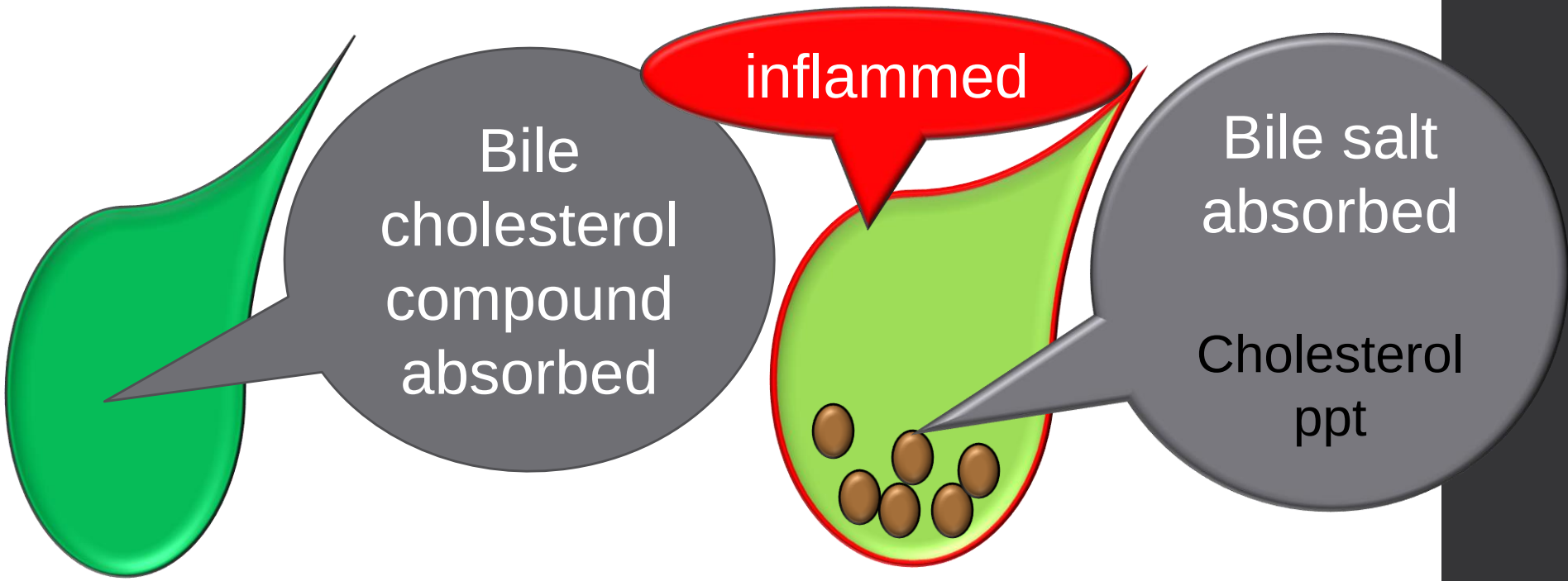
Pain via the phrenic nerve is referred to the right shoulder

FUNCTIONS OF GALL BLADDER

- Storage of bile
- Absorption of water and concentration of bile 10 times

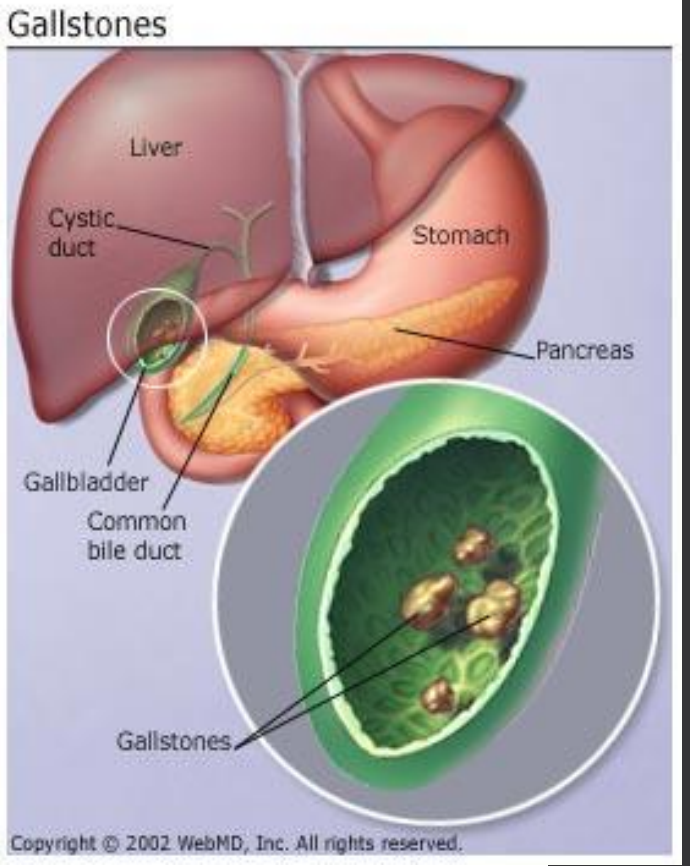
Functions of Gall bladder

Bile salt: cholesterol solvent



BILE

- Bile composed of water, ions, bile acids, organic molecules (including cholesterol, phospholipids, bilirubin)
- Gallstones are mostly cholesterol
- Acids and salts emulsify fats for absorption across wall of small intestines into lacteal lymph capillaries (review)
- Contains waste products from RBC breakdown and other metabolic processing (color of feces from bilirubin in bile)(review)
- Ions buffer chyme from stomach (review)

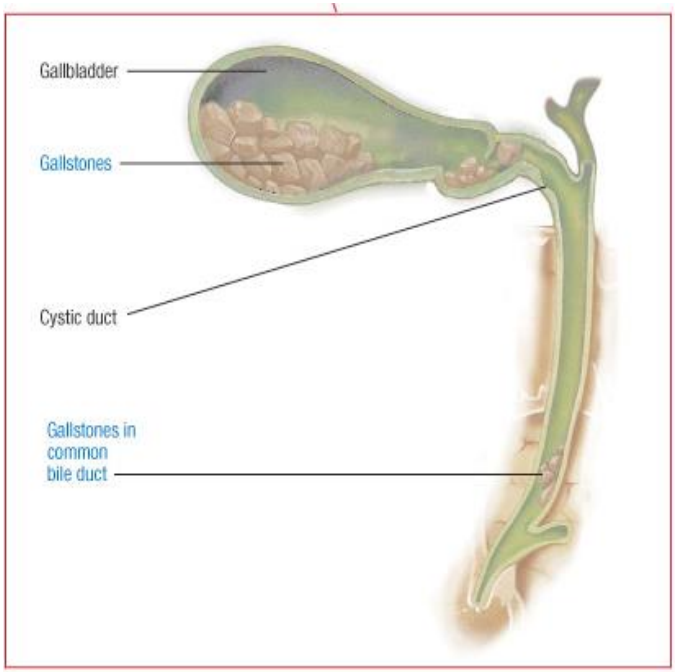


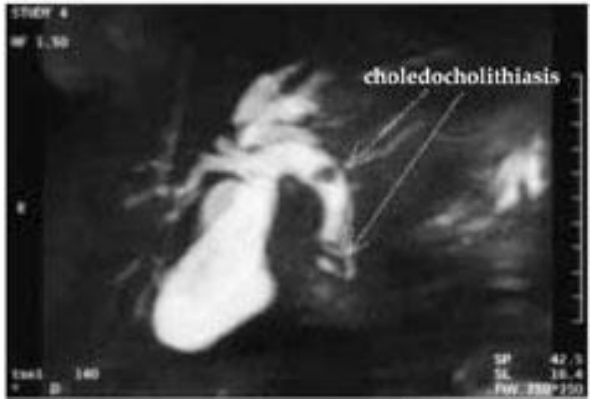
Applied anatomy

- ANOMALIES OF THE GALL BLADDER
- ANOMALIES OF THE DUCTS
- ANOMALIES OF BLOOD VESSELS

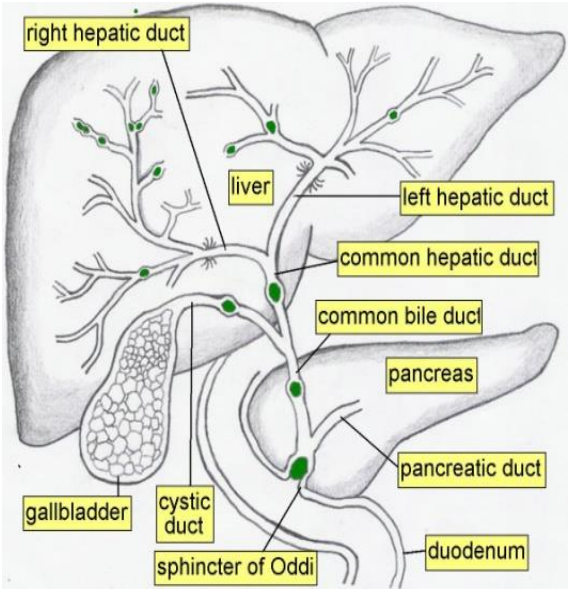
Cholelithiasis

- GB shows likely sites of stone formation/deposition





magnetic resonance cholangiopancreatography

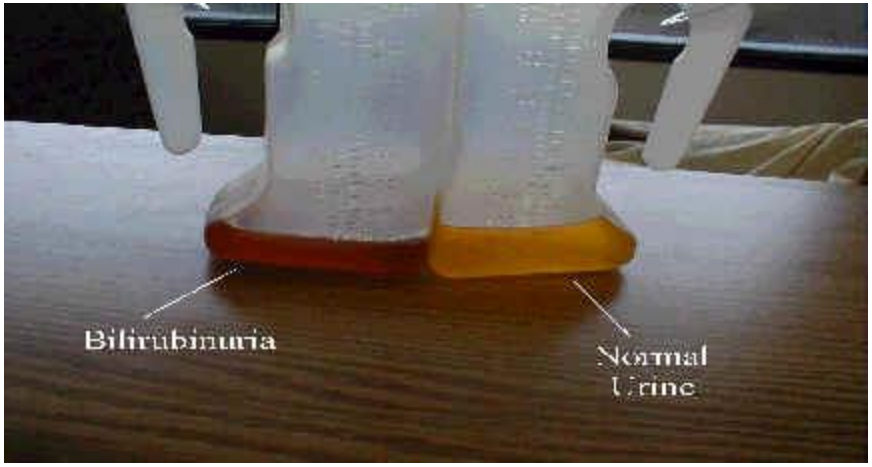



CM
1
3
4

Obstructive jaundice/post hepatic jaundice

common causes

- gallstones in the common bile duct
- pancreatic cancer in the head of the pancreas.




THANK
YOU