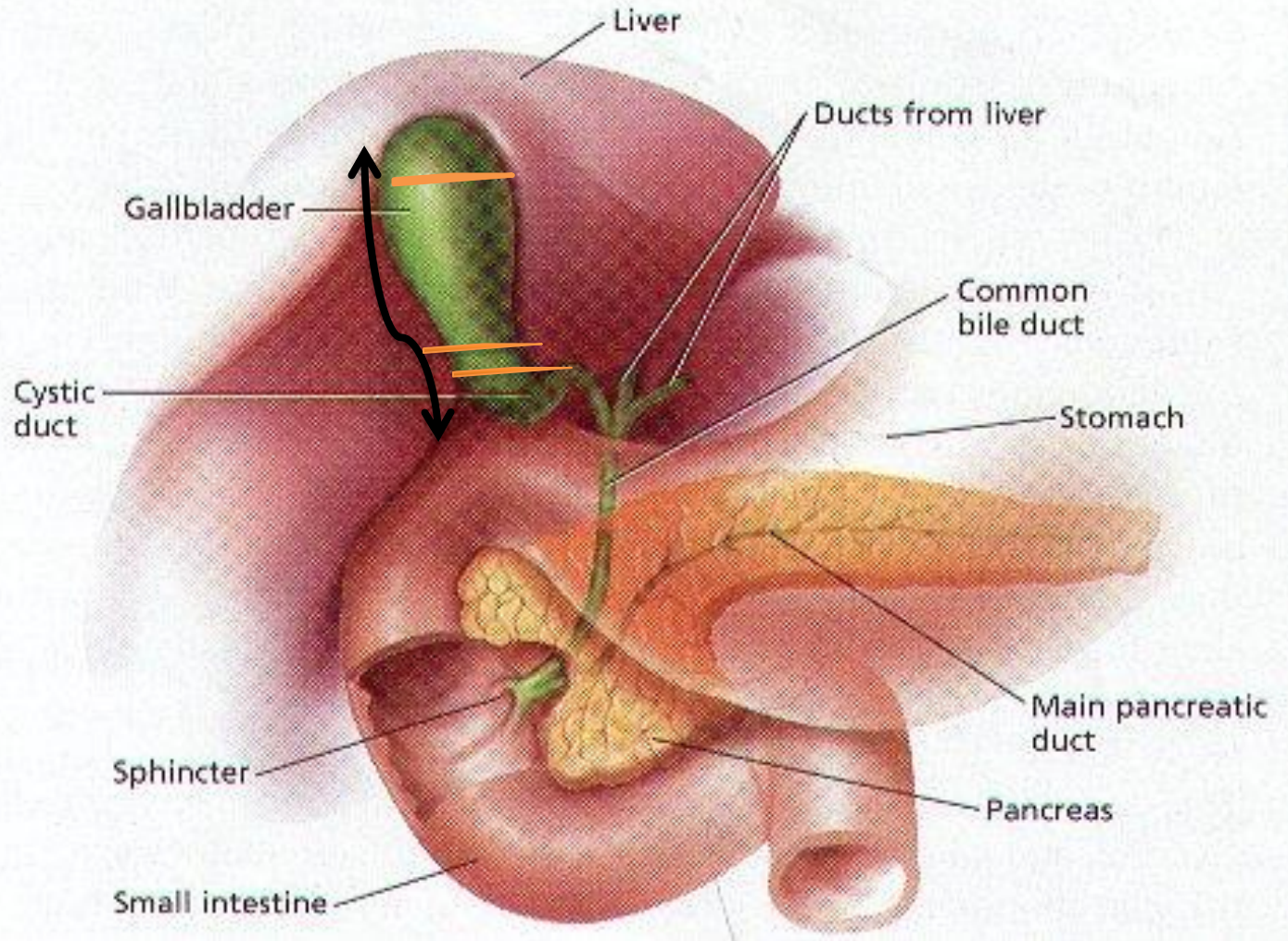
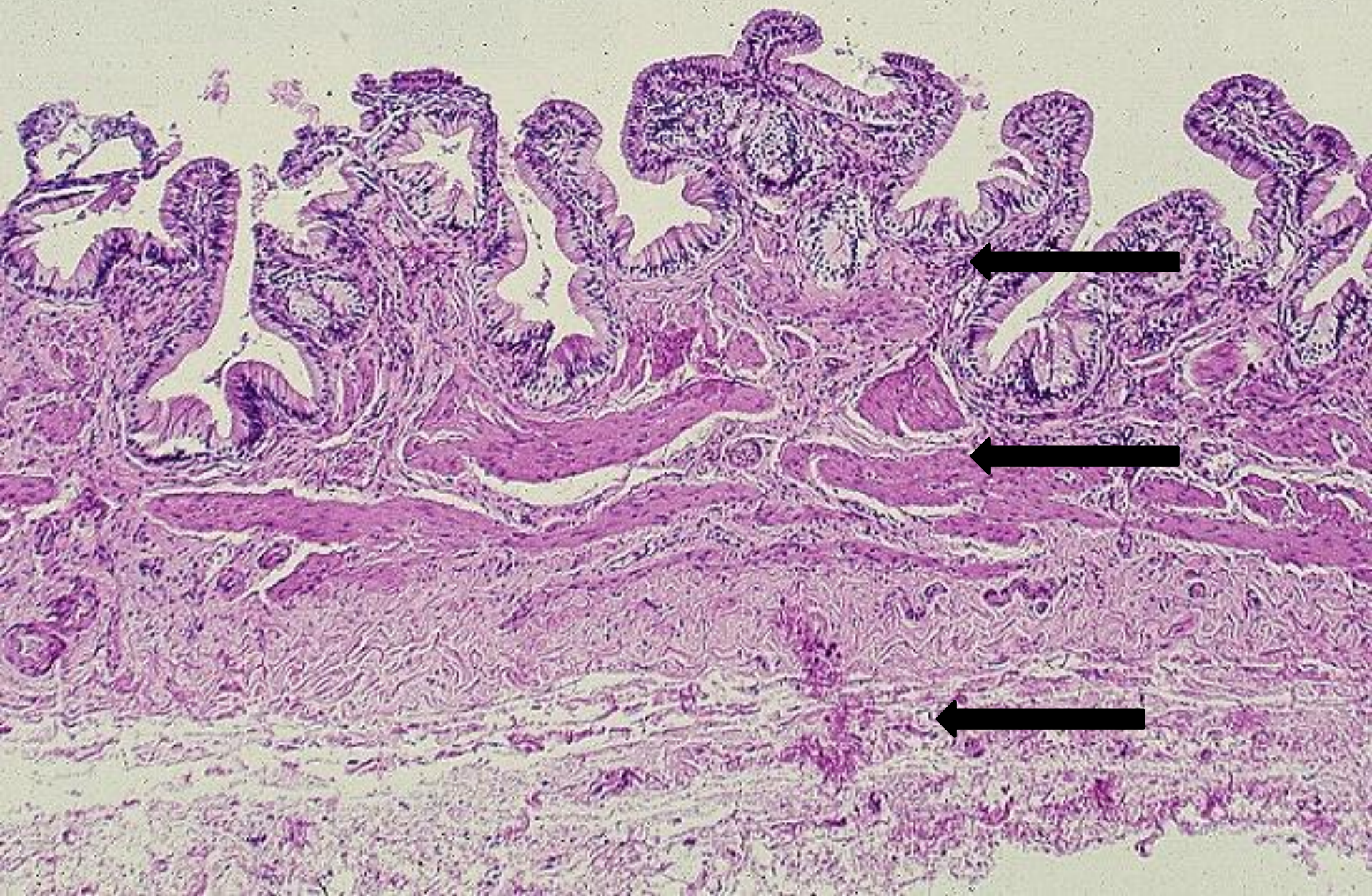


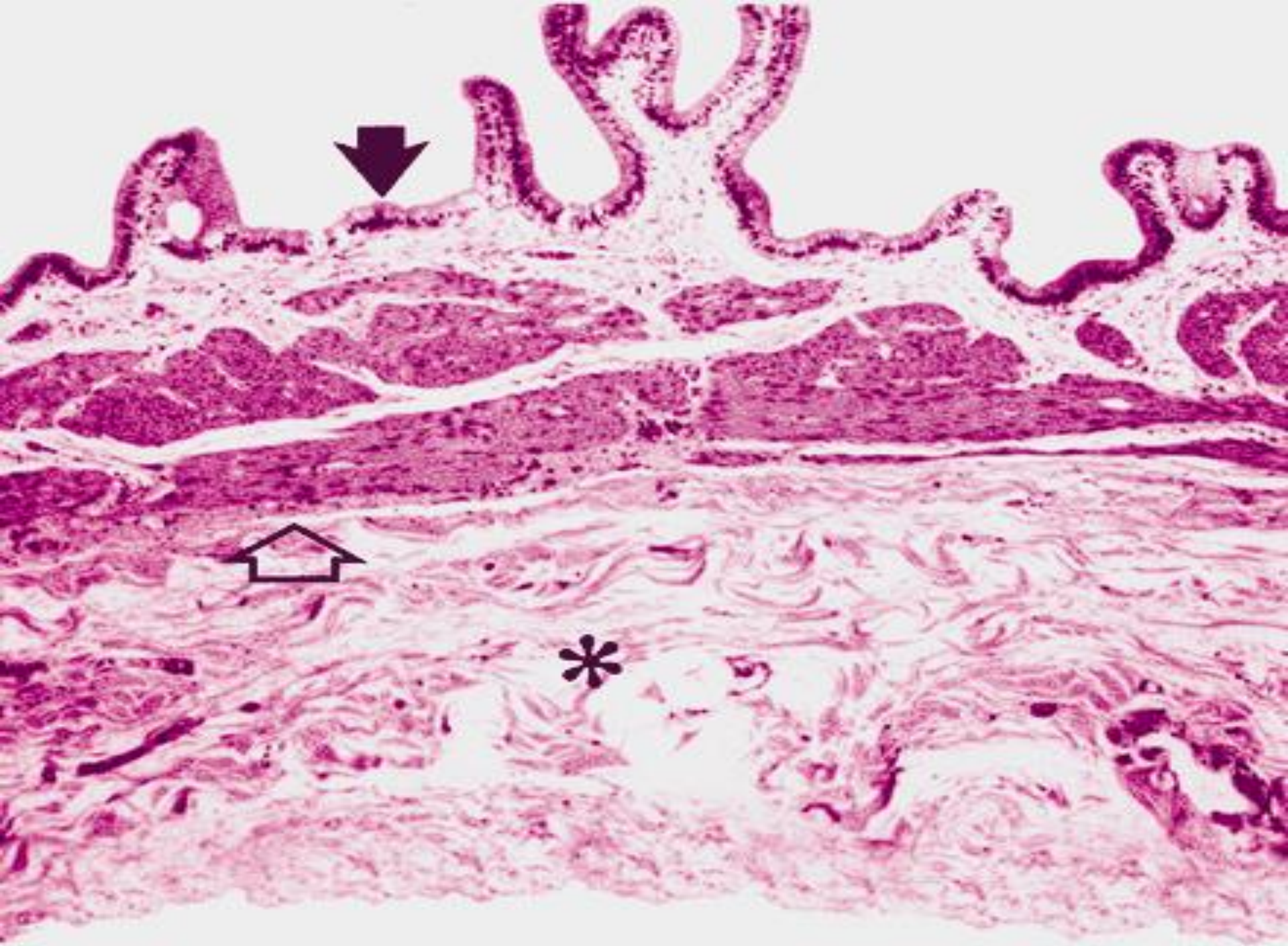
Diseases of GALL BLADDER

Pear-shaped sac

Posterior aspect of the right hepatic lobe







CONGENITAL ABNORMALITIES

- Duplication
- Agenesis
- Multiseptation
- Presence of heterotopic tissues
- Biliary atresia:
 - Gallbladder and extrahepatic ducts may be completely absent or may be represented by a fibrous cord without a lumen

Phrygian cap deformity

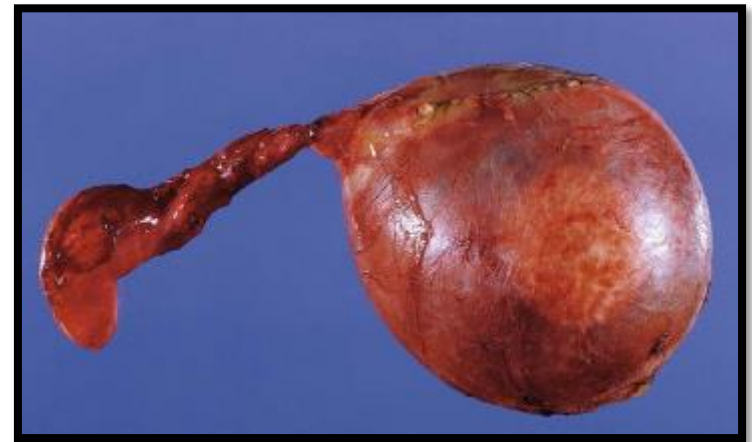
- Inversion of the fundus into the body of the organ, to which it may become adherent



- **Choledochal cyst:**

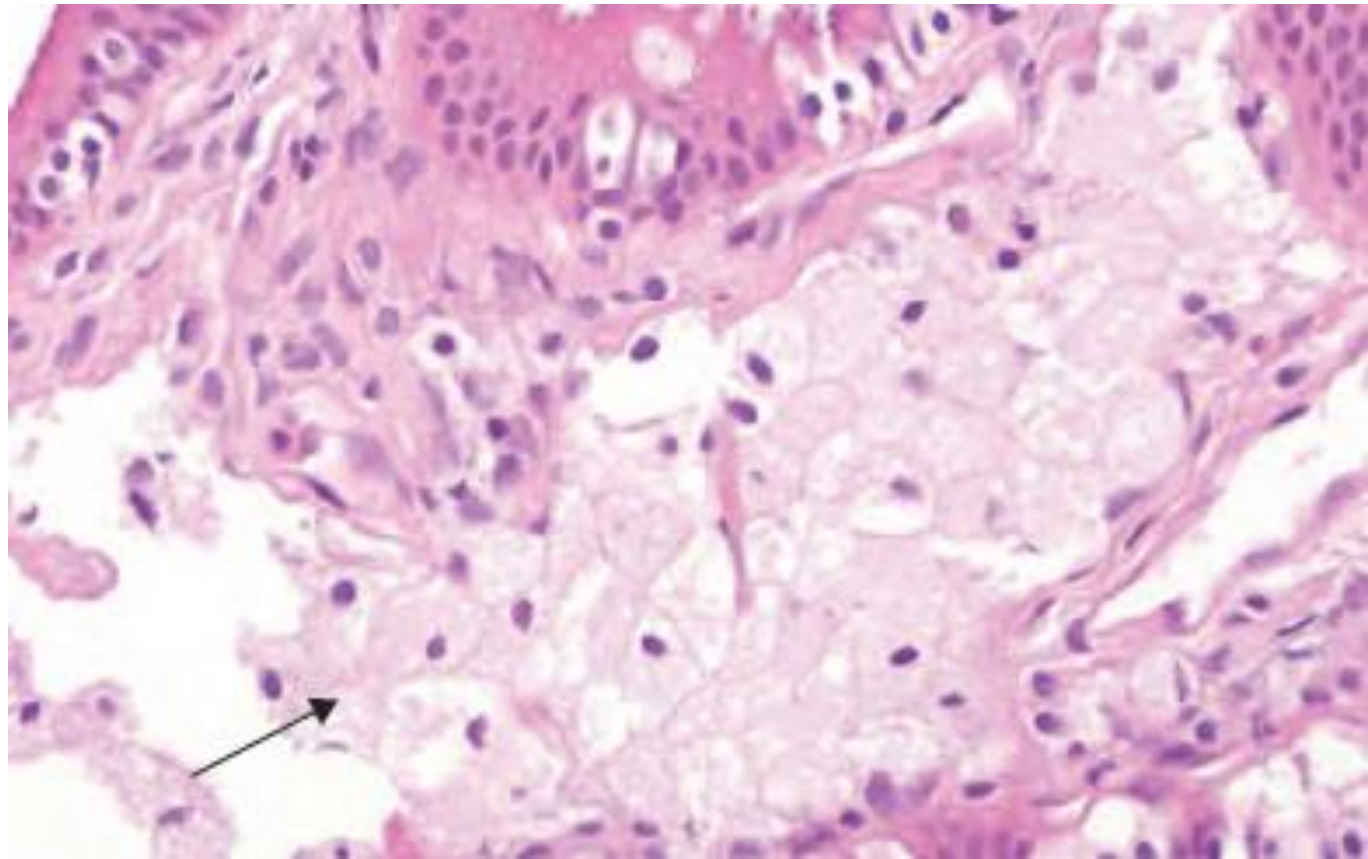
- Most common cause of obstructive jaundice in children beyond infancy
- Pseudo cyst
- Focal fusiform or spherical dilation of the common bile duct
- Females
- Clinical features:
 - Pain
 - jaundice
 - Mass

- **Gross:**
 - Cyst wall is fibrous and sometimes calcified.
 - The average amount of bile in the cavity is 1–2 liters



Cholesterolosis

- Cholesterol hypersecretion of liver promotes excess accumulation of cholesterol esters in the lamina propria of gall bladder.
- Mucosal surface studded with minute yellow flecks producing **Strawberry gall bladder**



Definitions

- **Cholelithiasis**: Formation of stones (calculi) within the gallbladder or biliary duct system
- **Cholecystitis**: Inflammation of gall bladder
- **Cholangitis**: Inflammation of the biliary ducts

CHOLECYSTITIS

- ACUTE
- CHRONIC
- Acute on chronic

ACUTE CHOLECYSTITIS

- Acute cholecystitis is acute inflammation of the gallbladder caused by obstruction(90%) of the neck/cystic duct
- Primary complication of gallstones

Acute acalculous cholecystitis

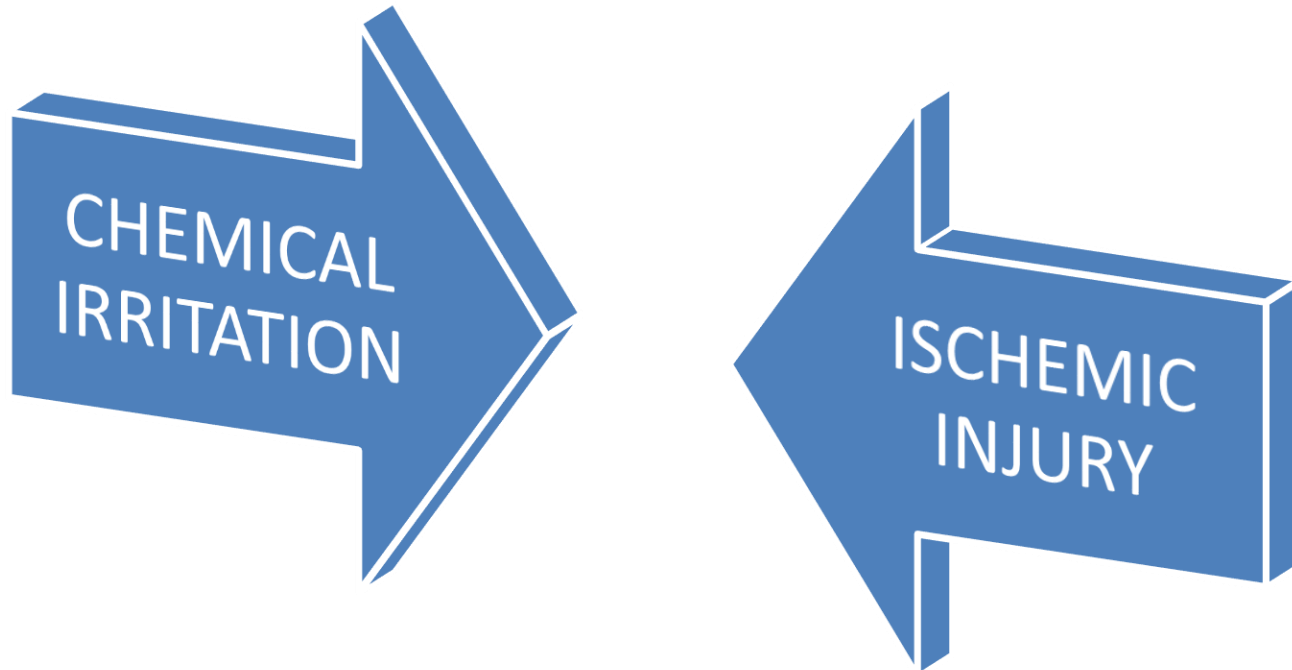
- Absence of gallstones
- Occurs in severely ill patients
 - Post op state after major surgery
 - Severe trauma
 - severe burns
 - Multiorgan failure
 - Sepsis
 - Prolonged intravenous hyperalimentation
 - Postpartum state

Clinical features

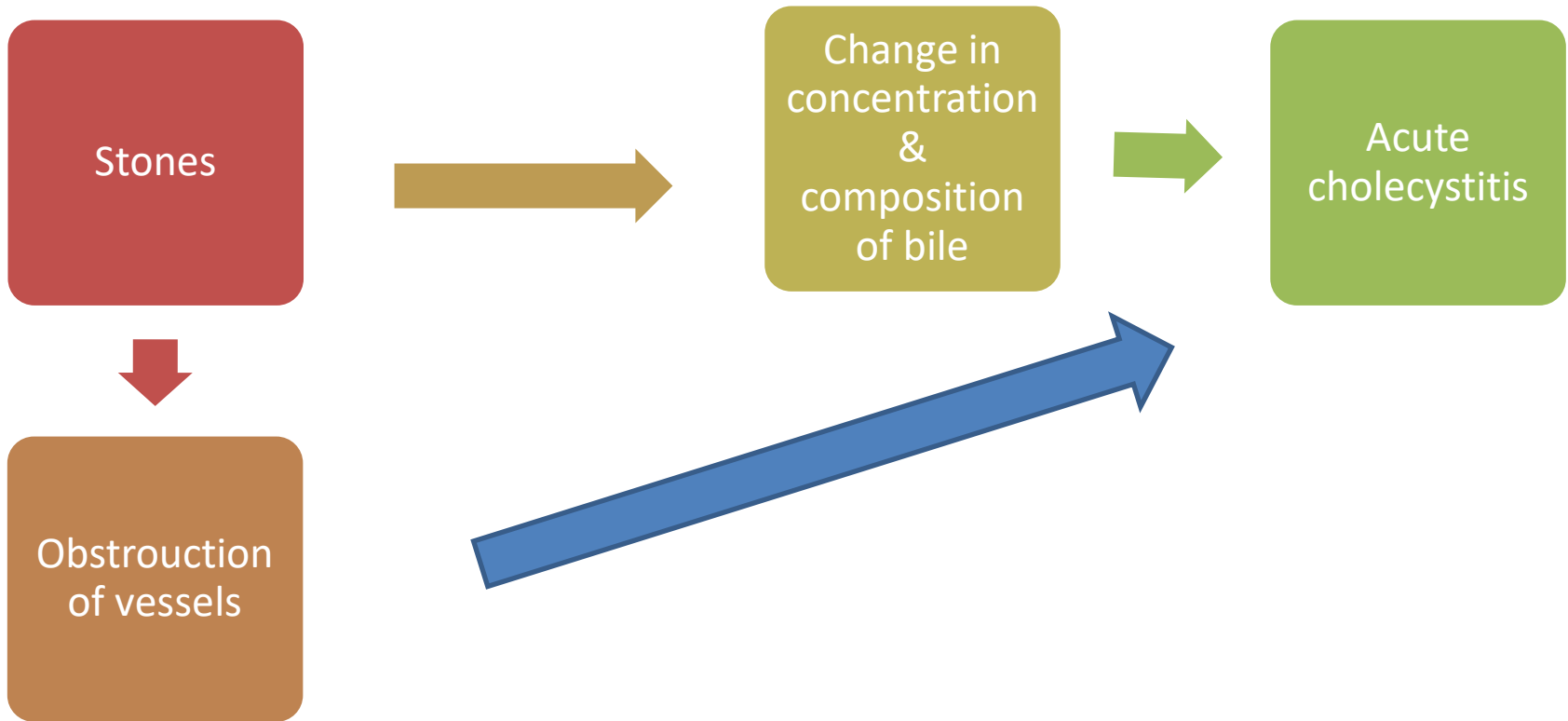
- Right upper quadrant
- Nausea and vomiting
- Fever
- Leucocytosis
- Increased alkaline phosphatase

PATHOGENESIS OF ACUTE CALCULOUS CHOLECYSTITIS

Gall stones



PATHOGENESIS OF ACUTE CALCULOUS CHOLECYSTITIS



Chemical agents

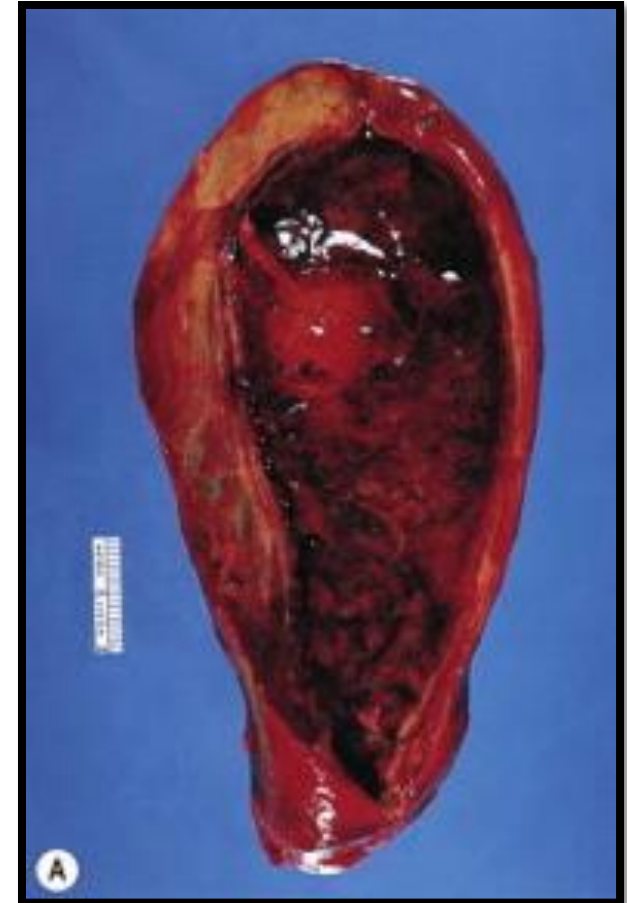
- Trypsin from pancreatic juice
- Unconjugated bile salts
- Phospholipid lysolecithin
- Release of prostaglandins contribute to inflammation

PATHOGENESIS OF ACUTE ACALCULOUS CHOLECYSTITIS

- Dehydration
- Gallbladder stasis
- Biliary sludge , viscous bile , gallbladder mucus
- Bacterial contamination and formation of lysolecithins

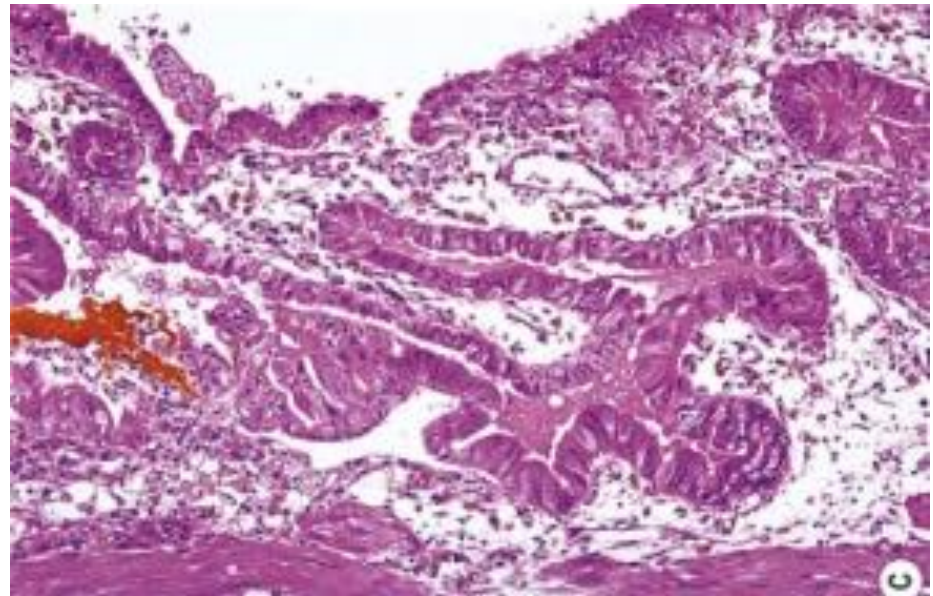
GROSS

- Enlarged and tense
- Bright red, violaceous to green black discolouration with subserosal haemorrhages
- Serosa : Suppurative exudate
- Gallbladder wall : Thickened and edematous
- Cut surface shows stones



Microscopy

- Edema
- Leucocytic infiltration
- Congestion
- Frank abscess
- Gangrenous necrosis



CHRONIC CHOLECYSTITIS

- Sequel of repeated attacks of acute cholecystitis
- 90% ass with cholelithiasis

Morphology

- Serosa : Smooth and glistening wall fibrosis
- Wall thickened
- Lumen : Green yellow clear mucoid bile and stones
- Mucosa : Usually preserved

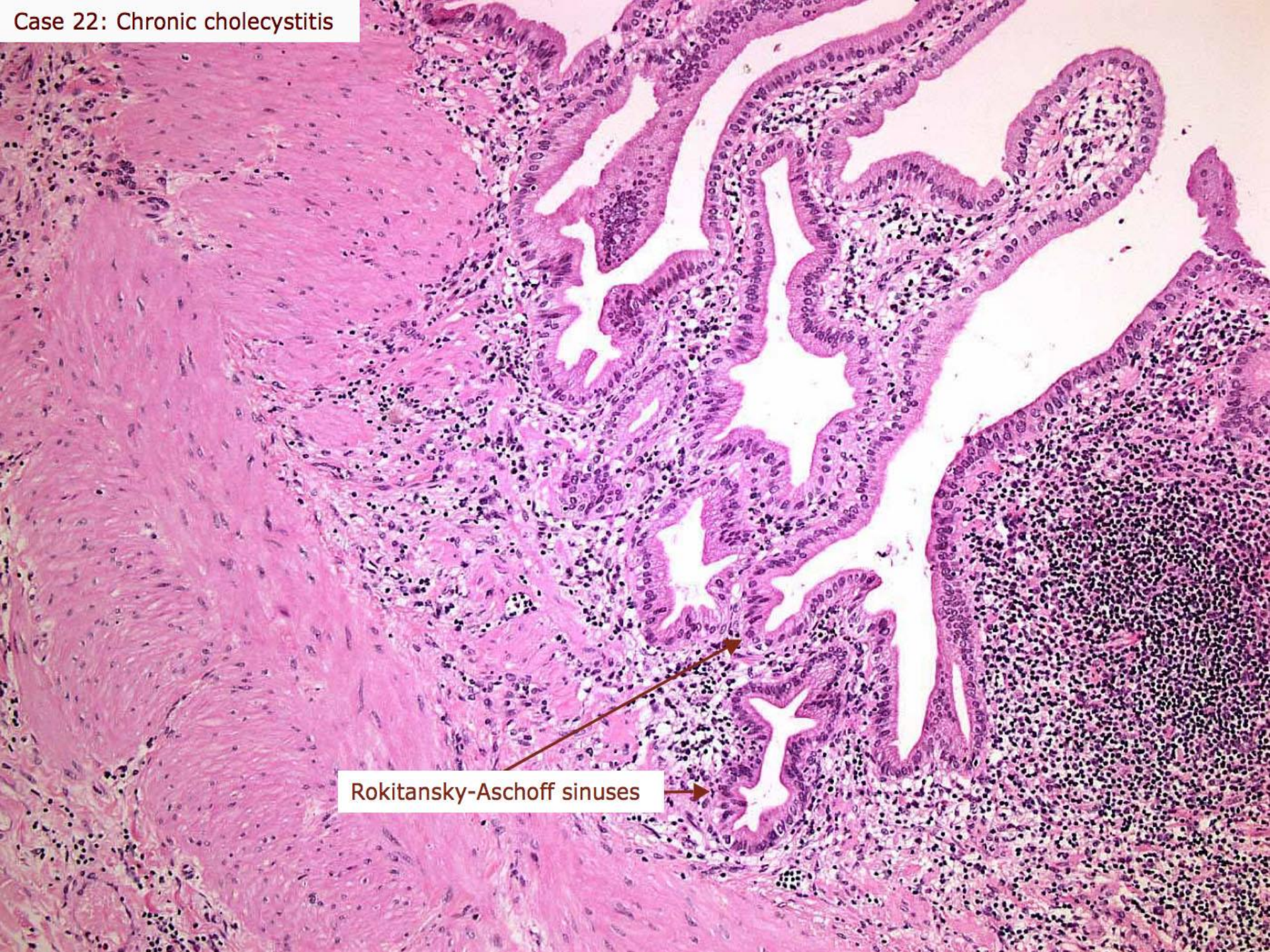
Gross – chronic calculous cholecystitis



Microscopy

- Infiltration by lymphocytes, plasma cells, macrophages in mucosa and subserosal fibrous tissue
- Marked subepithelial and subserosal fibrosis
- Reactive proliferation of mucosa and fusion of mucosal folds give rise to buried crypt of epithelium within the gallbladder
- *Rokitansky – Aschoff sinuses* : Outpouchings of mucosa epithelium within the wall

Case 22: Chronic cholecystitis



Rokitansky-Aschoff sinuses

Case 22: Chronic cholecystitis

the lamina propria is infiltrated by lymphocytes and plasma cells



lymphoid follicle formation is seen within the lamina propria

- **Porcelain gallbladder:**

- Extensive dystrophic calcification
- Increased incidence of cancer



Xanthogranulomatous cholecystitis :

- Shrunken , nodular , inflamed with necrosis and haemorrhage
- Abundant macrophages packed with lipids mixed with fibrous tissue response
- Confused with malignant neoplasm

- ***Hydrops of gallbladder :***

- Atrophic chronically obstructed gallbladder which contains only clear secretions

Acute Cholangitis

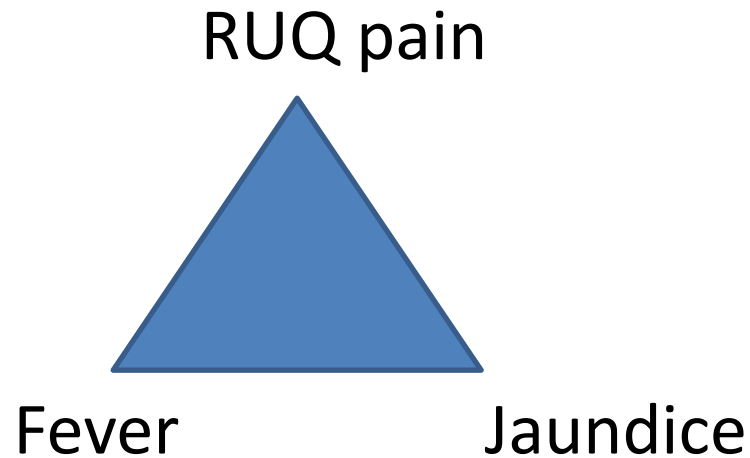
- Potentially life-threatening **bacterial infection** of the bile ducts , assoc with partial or **complete obstruction ductal system**.
- Causes:
 - E. coli
 - Enterobacter
 - Pseudomonas
 - Kleibsiella
 - Clostridium
 - Bacteroides

Etiology

- Choledocholithiasis
- Primary sclerosing cholangitis
- Bile duct stricture
- Malignancy
- Acute or chronic pancreatitis

Clinical features

Charcot's triad



Reynold's pentad:

Shock

Altered mental status

Diagnosis

- Leukocytosis
- Elevated Bilirubin
- Alkaline phosphatase
- Ultrasound
- HIDA
- CT scan

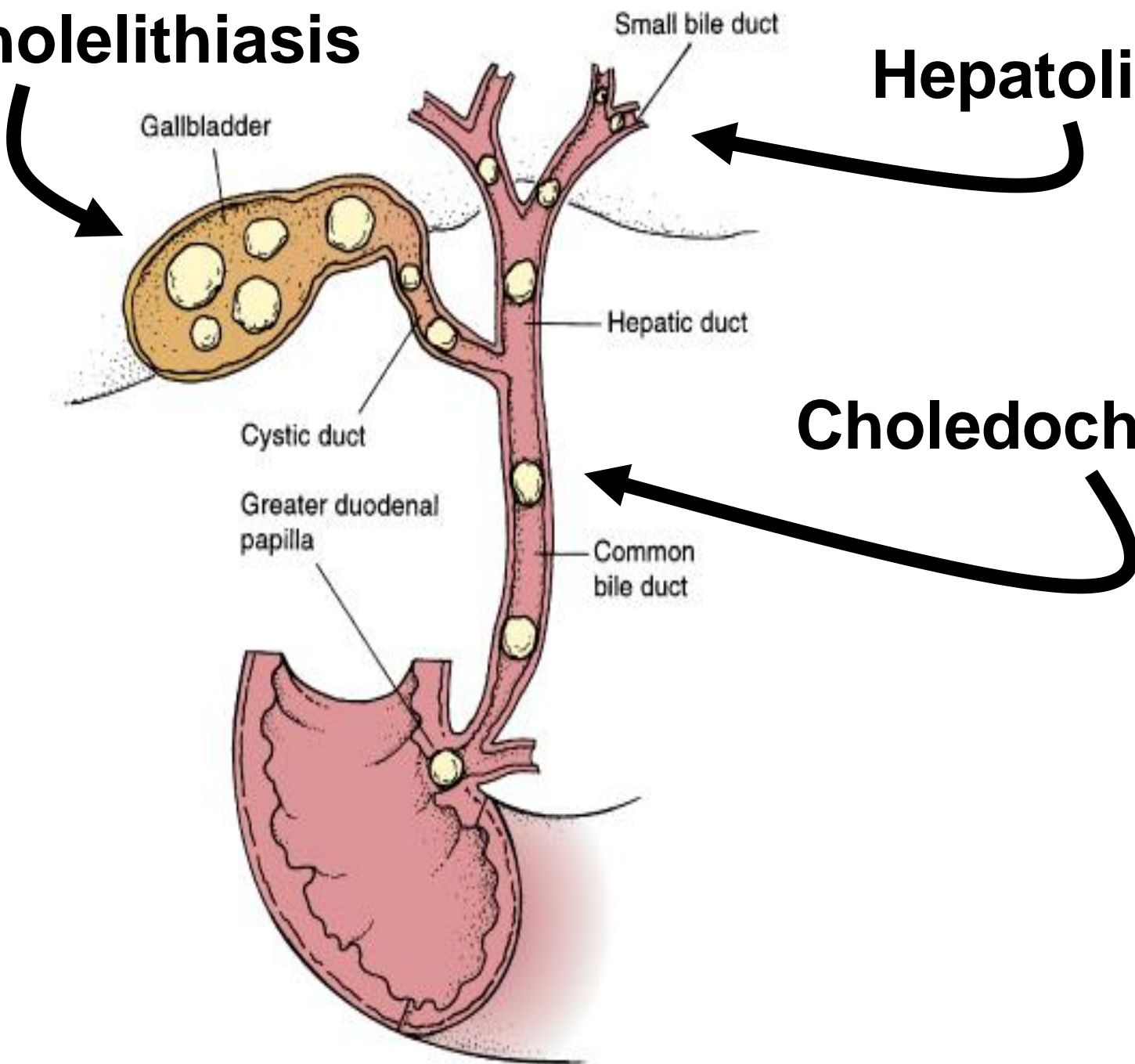
GALLSTONES (CHOLELITHIASIS)

- Concretions formed from normal or abnormal constituents of bile
 - Cholesterol
 - Calcium bilirubinate
 - Calcium carbonate

Cholelithiasis

Hepatolithiasis

Choledocholithiasis



RISK FACTORS FOR GALL STONES

CHOLESTEROL STONES

- Obesity
- Familial
- Diabetes mellitus
- High calorie diet
- Rapid weight reduction

PIGMENT STONES

- Chronic hemolysis
- Infection

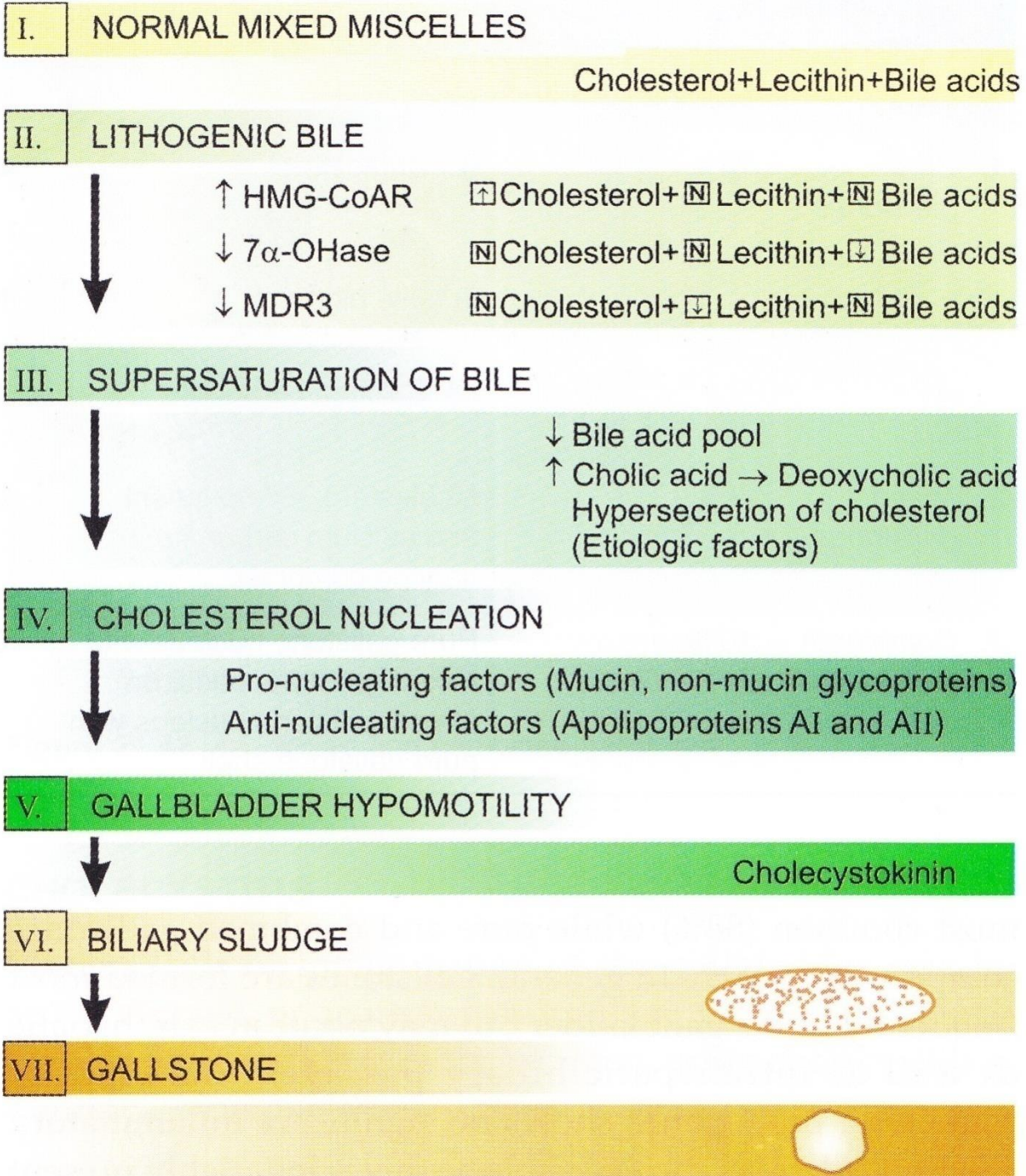
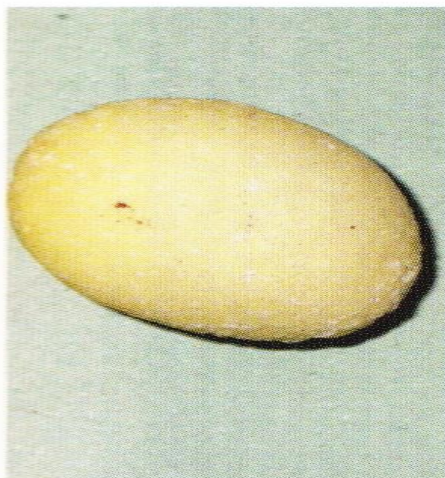


TABLE 21.12: Features of Gallstones.

Type	Frequency	Composition	Gallbladder Changes	Appearance
1. <i>Pure gallstones</i>	10%	i) Cholesterol	Cholesterolosis	Solitary, oval, large, smooth, yellow-white; on C/S radiating glistening crystals
		ii) Bile pigment	No change	Multiple, small, jet-black, mulberry-shaped; on C/S soft black
		iii) Calcium carbonate	No change	Multiple, small, grey-white, faceted; C/S hard
2. <i>Mixed gallstones</i>	80%	Cholesterol, bile pigment and calcium carbonate in varying combination	Chronic cholecystitis	Multiple, multifaceted, variable size, on C/S laminated alternating dark-pigment layer and pale-white layer
3. <i>Combined gallstones</i>	10%	Pure gallstone nucleus with mixed gallstone shell, or mixed gallstone nucleus with pure gallstone shell	Chronic cholecystitis	Solitary, large, smooth; on C/S central nucleus of pure gallstone with mixed shell or vice versa



CHOLESTEROL (YELLOW-WHITE)



PIGMENT (MULBERRY-SHAPED)



CALCIUM CARBONATE (HARD)

Figure 21.40  Pure gallstones of various types.

Bile pigment stones

Black	Brown
Sterile gall bladder bile	Infected extra/intra hepatic ducts
Oxidised polymers of calcium salts of unconj bilirubin CaCO₃ , CaPO₄ , glycoproteins , chol. monohydrate	Pure Ca salts of unconj bil , mucin , glycoprotein , cholesterol , ca salts of palmitate and stearate
Multiple Spiculated & molded	Laminated Soft & greasy
50-75% radio opaque	



MIXED GALLSTONES
(MULTIFACETED)



COMBINED GALLSTONES
(SMOOTH-SURFACED)

Mixed and combined gallstones.

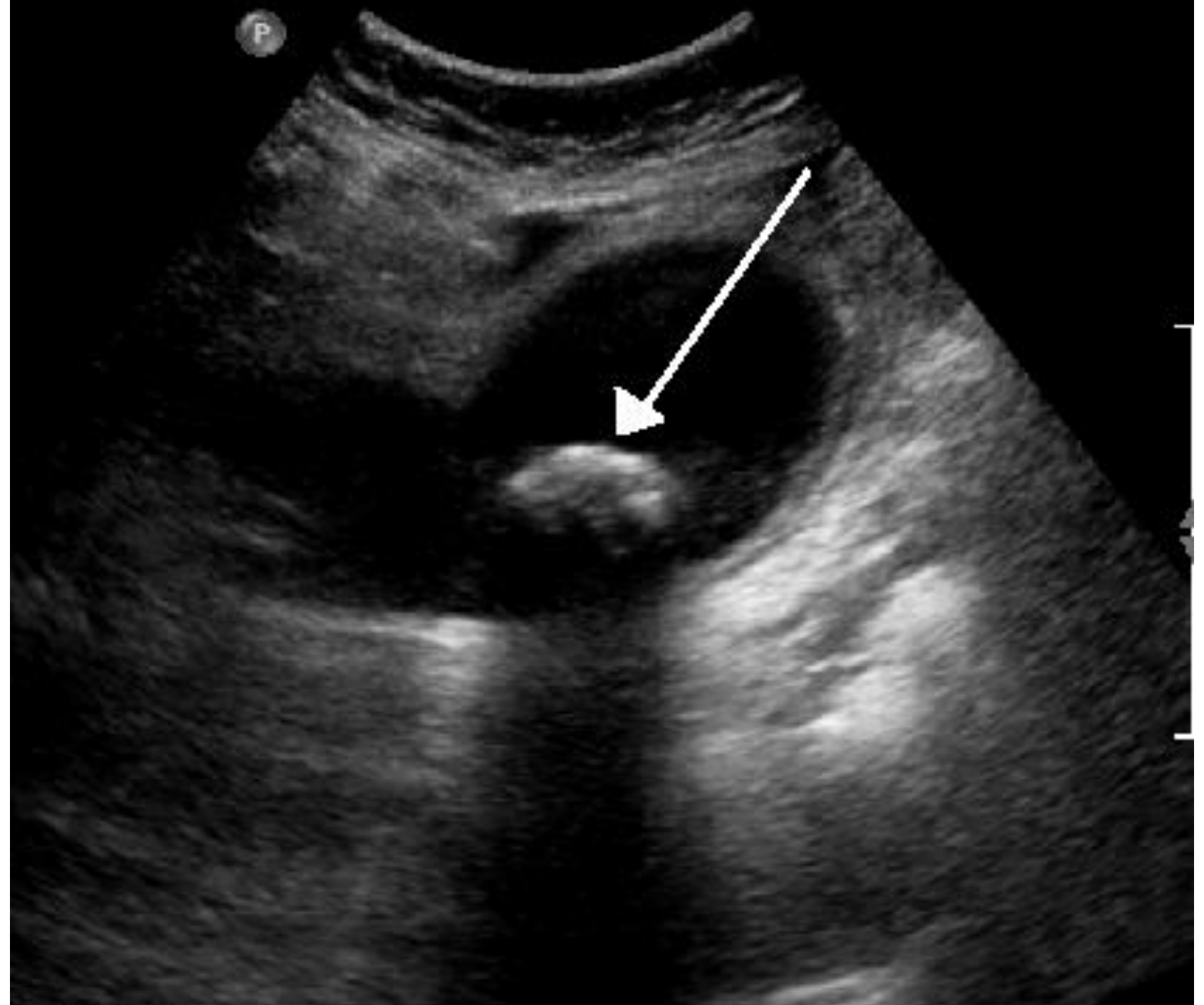
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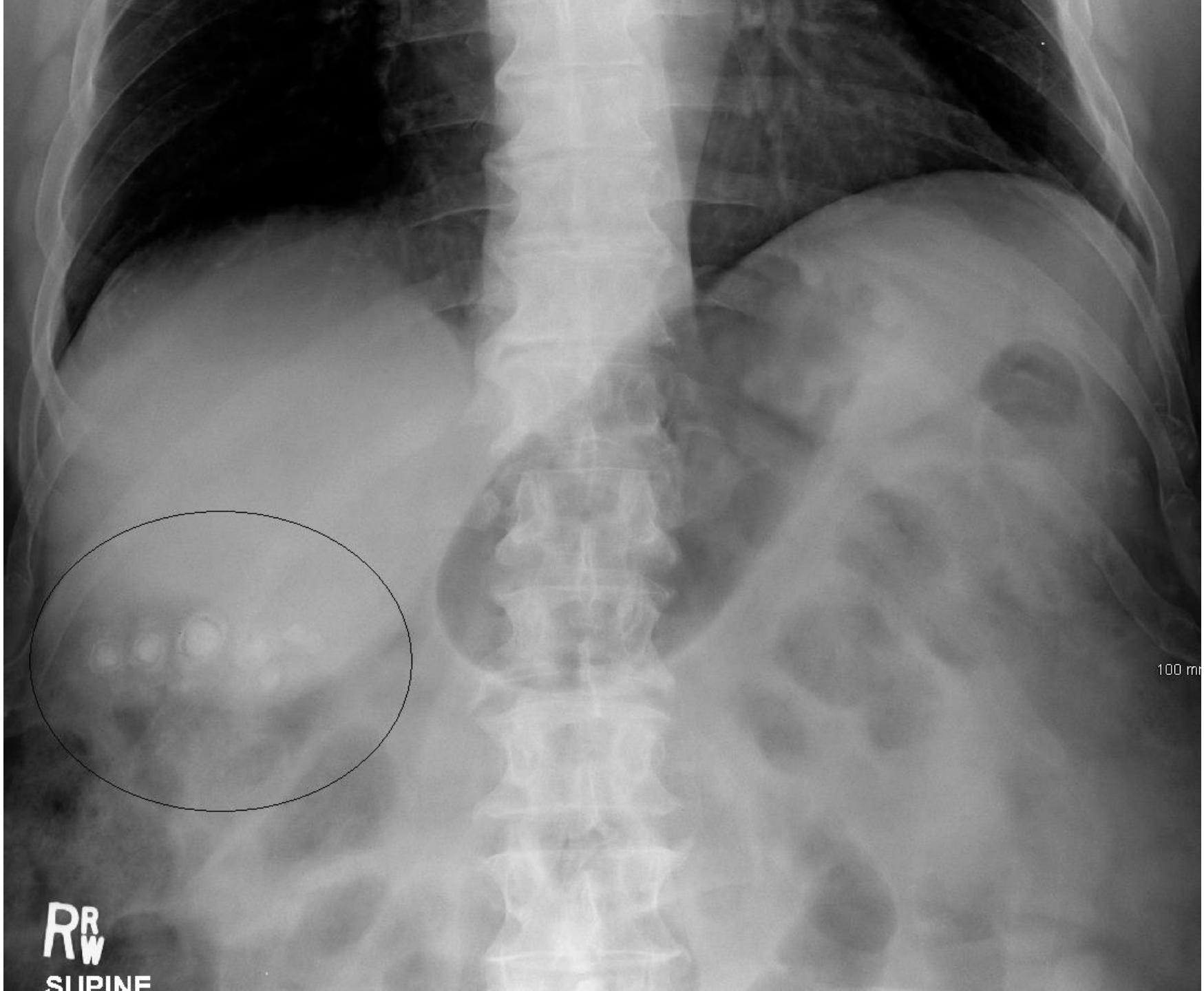






P





100 mm

RR
RW
SUPINE

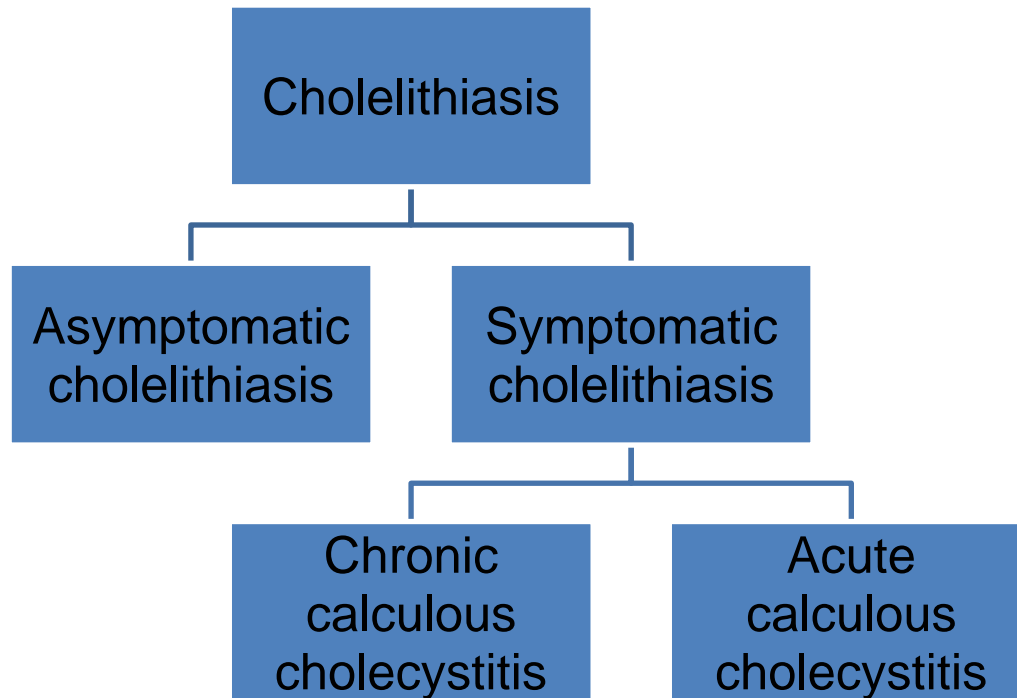
GALLSTONES – SYMPTOMS

- Asymptomatic
- Biliary pain, which tends to be excruciating and constant or “colicky” (spasmodic) in Right hypochondrium

COMPLICATIONS OF GALL STONES

- Cholecystitis – Acute & Chronic
- Empyema
- Perforation & Fistulas
- Inflammation of the biliary tree (cholangitis)
- Obstructive cholestasis or pancreatitis
- “Gallstone ileus” or Bouveret's syndrome
 - A large stone eroding directly into an adjacent loop of small bowel, leading to intestinal obstruction
- Malignancy

SPECTRUM OF GALLSTONE DISEASES



Gallbladder Cancer

- Most common cancer of biliary tract
- F > M ; 7th decade
- **More aggressive than cholangiocarcinoma**
- Most common risk factor:
 - Gallstones
 - Polyps
 - porcelain GB

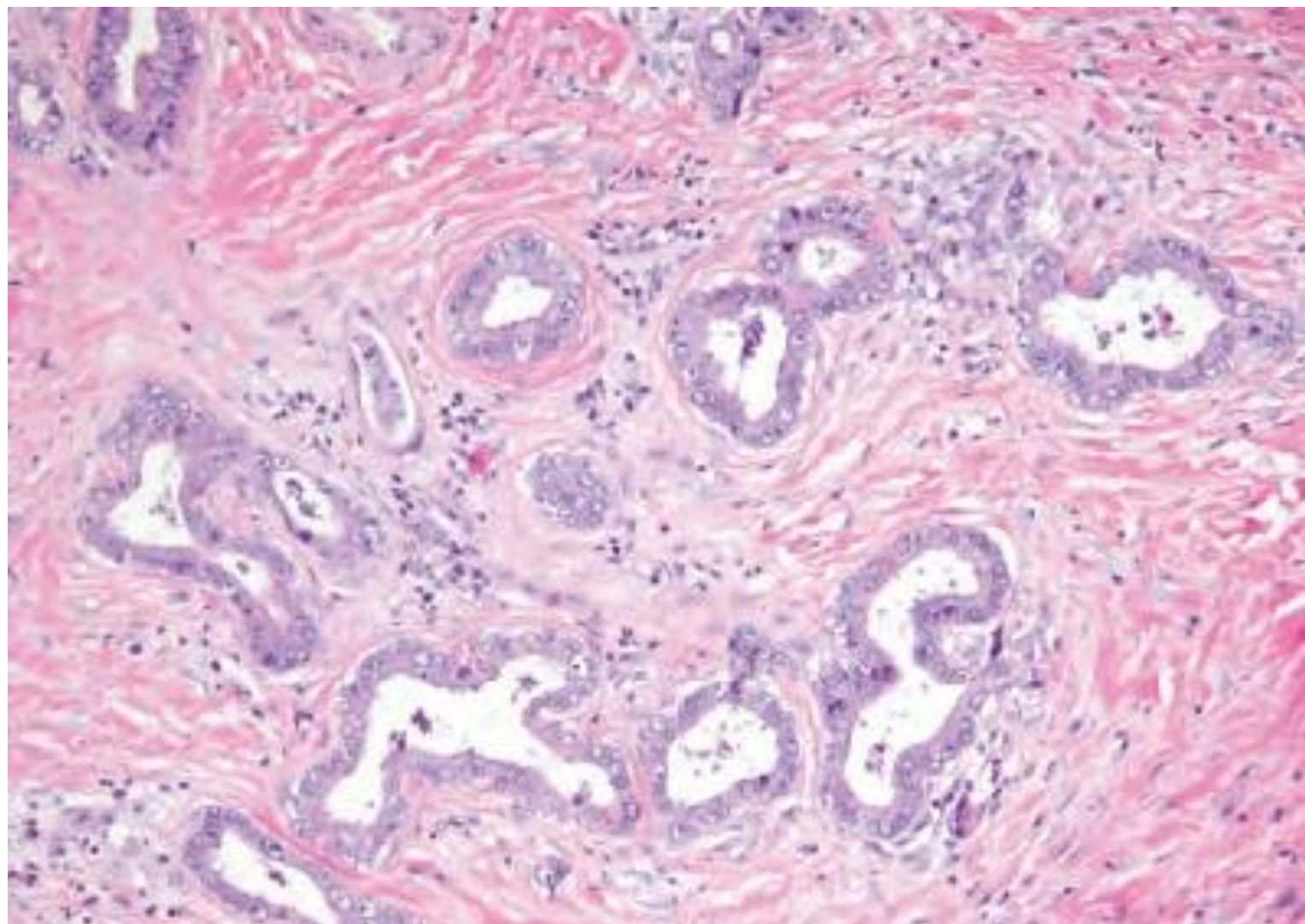
Gross

- Patterns of growth :
 - Infiltrating :
 - Area of diffuse thickening and induration of the gallbladder wall
 - Exophytic:
 - Grows into the lumen as irregular cauliflower like mass(necrotic, hemorrhagic, ulcerated)

- Tumors are *Scirrhou*s and firm in consistency
- Most common site : fundus and neck

Microscopy

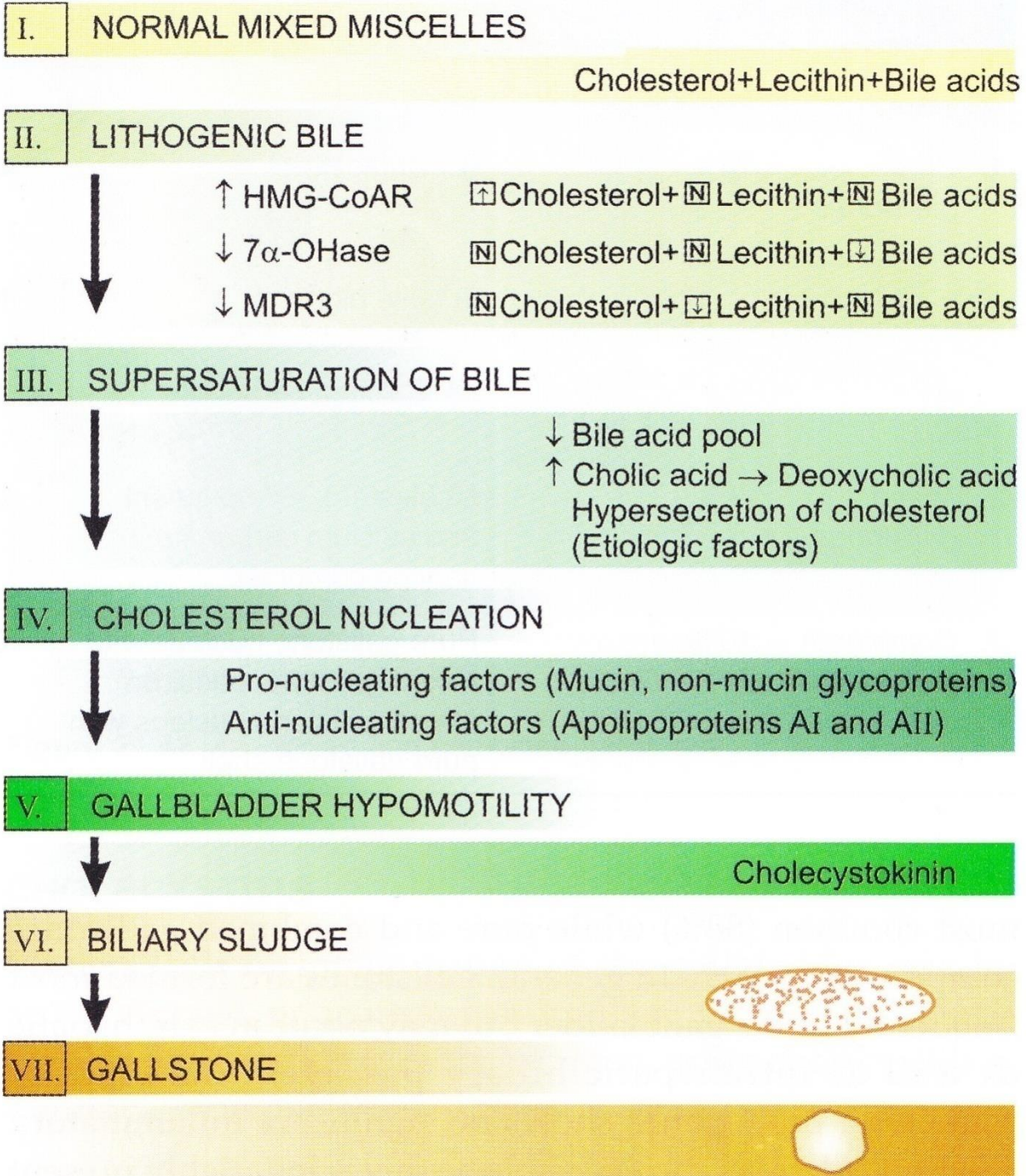
- *Adenocarcinoma*
- Glandular or papillary in architecture ; well to moderately differentiated
- 5% are squamous cell carcinomas or have adenosquamous differentiation



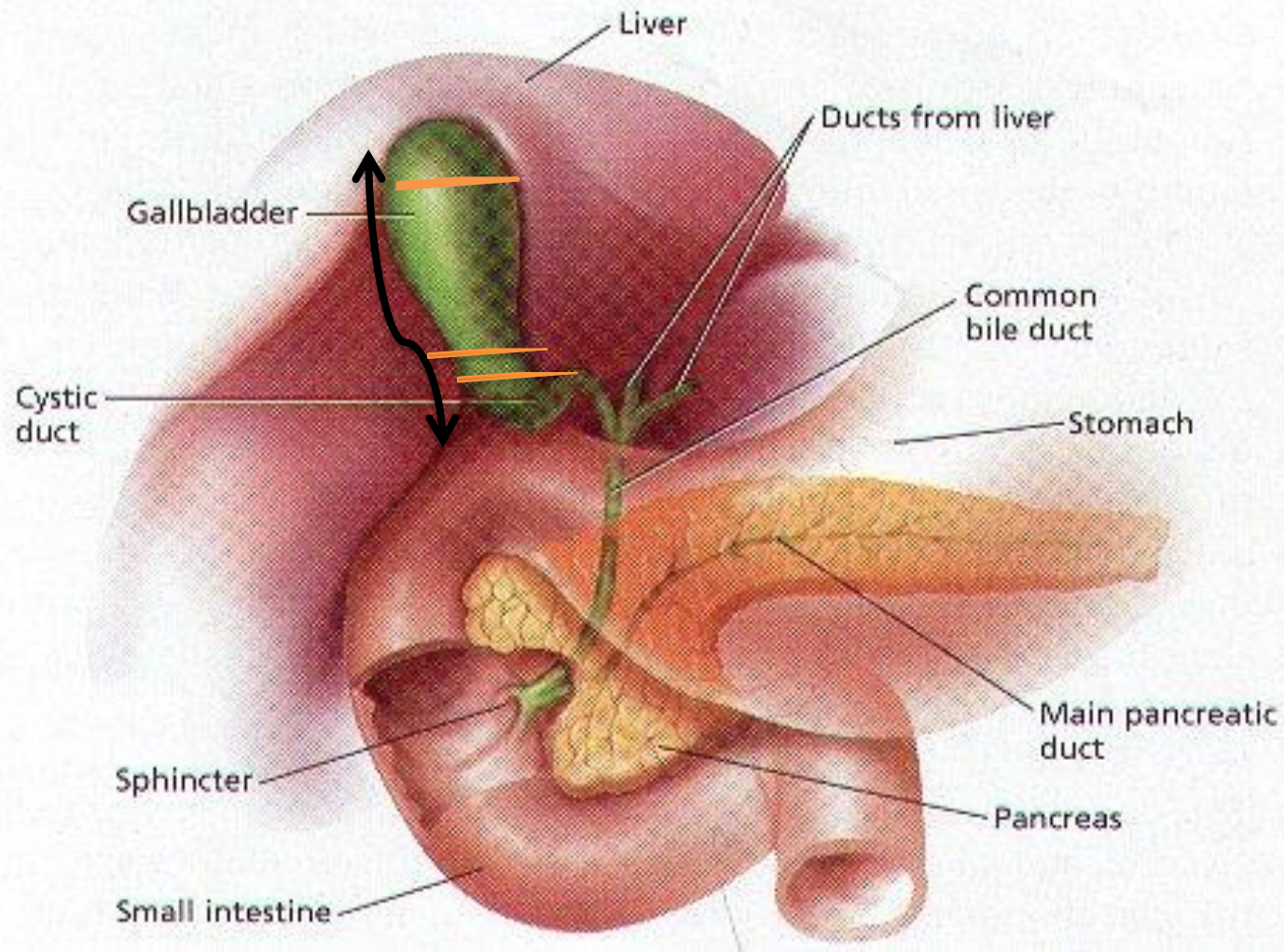
- Metastasis to liver already occurs by the time these tumors are diagnosed
- Cystic duct , bile duct
- Portahepatic lymph nodes
- Peritoneum , GIT , lungs

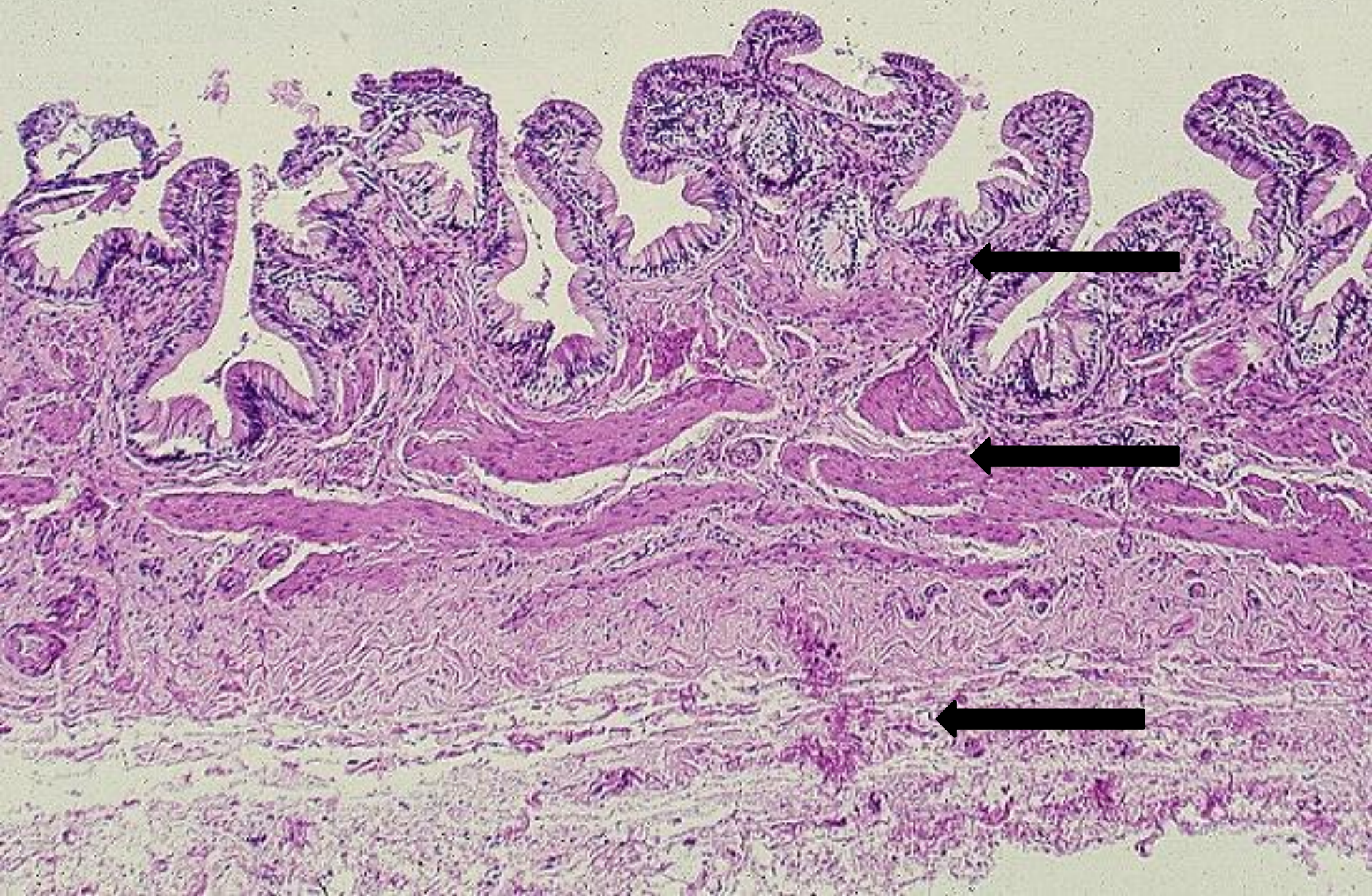
Clinical features

- Insidious in onset
- Abdominal pain , jaundice , anorexia , nausea , vomiting
- Pre op diagnosis possible only in 20% cases



Quiz

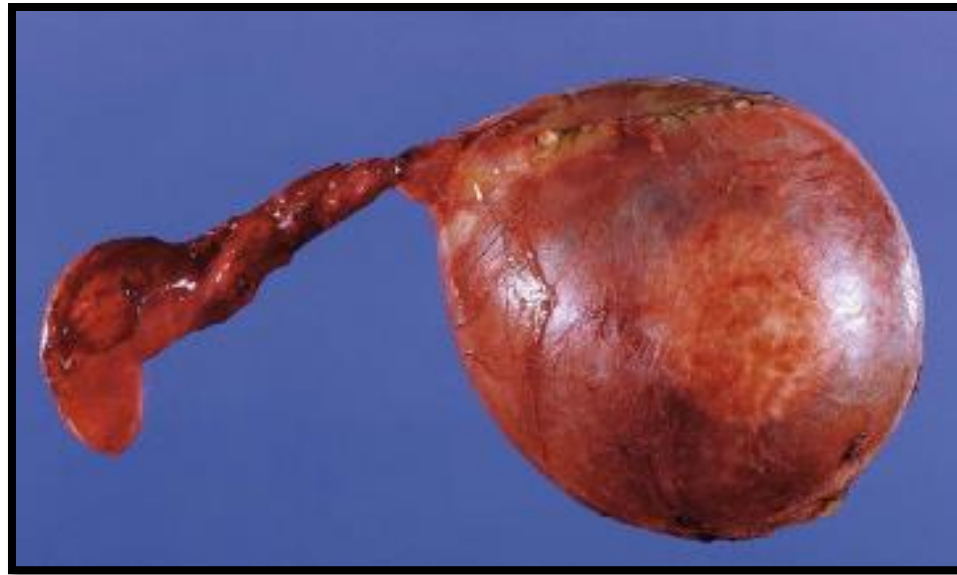




Phrygian cap deformity



Choledochal cyst



Cholangitis

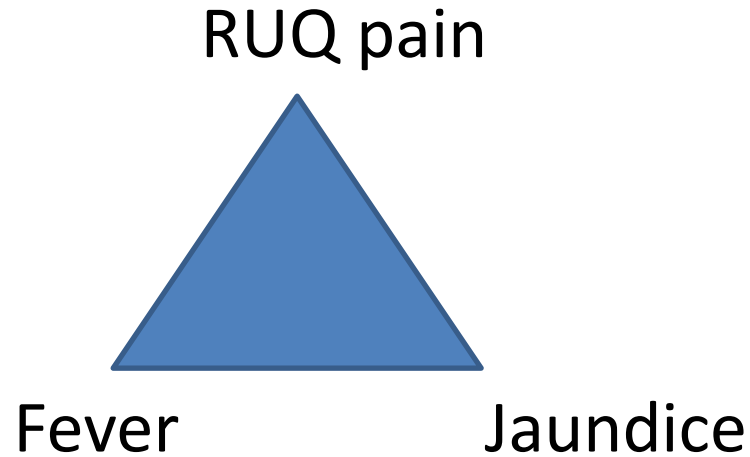
- Inflammation of the biliary ducts

Porcelain gallbladder



ACUTE CHOLANGITIS

Charcot's triad



Reynold's pentad

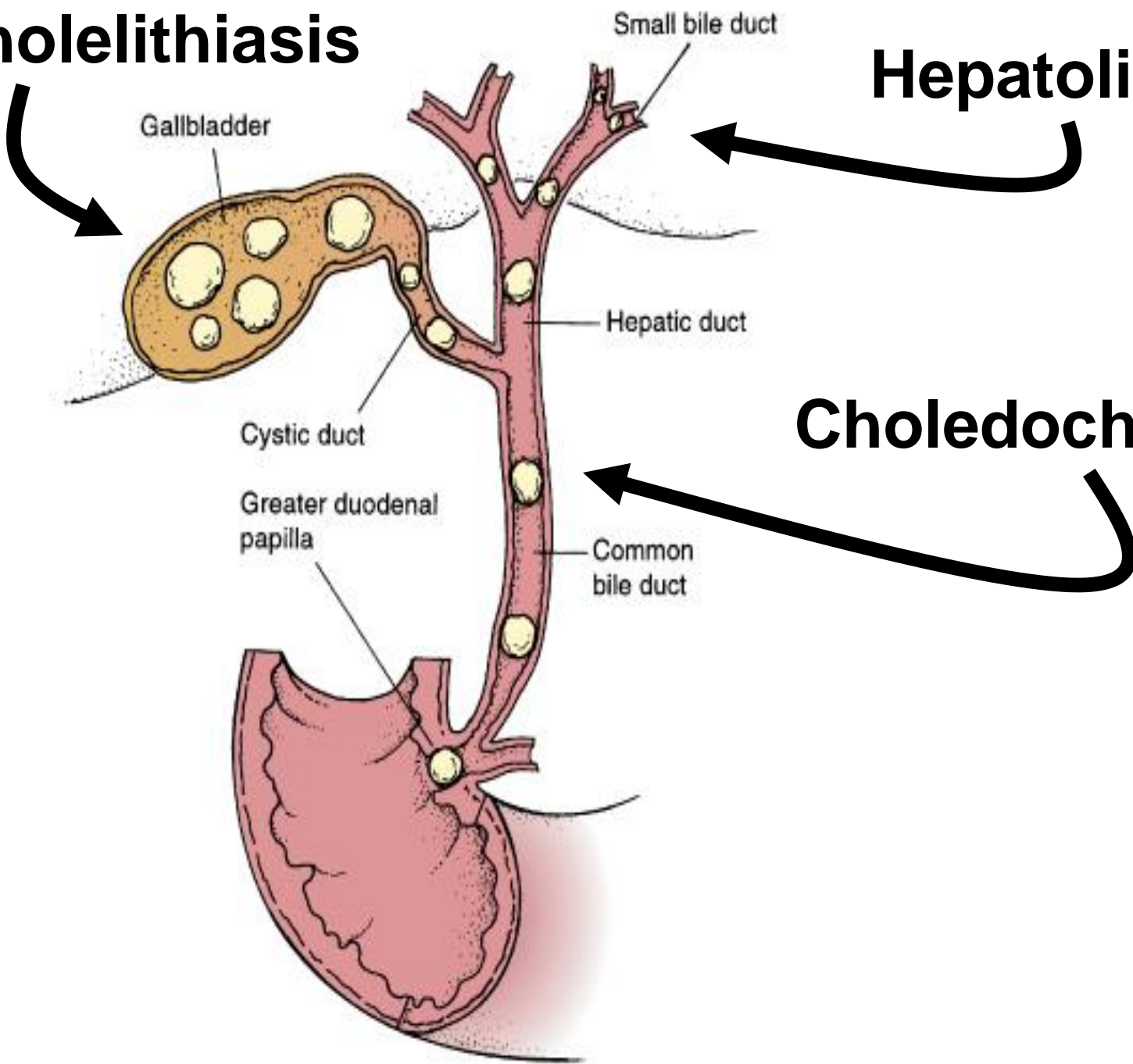
Shock

Altered mental status

Cholelithiasis

Hepatolithiasis

Choledocholithiasis



“Gallstone ileus” or Bouveret's syndrome

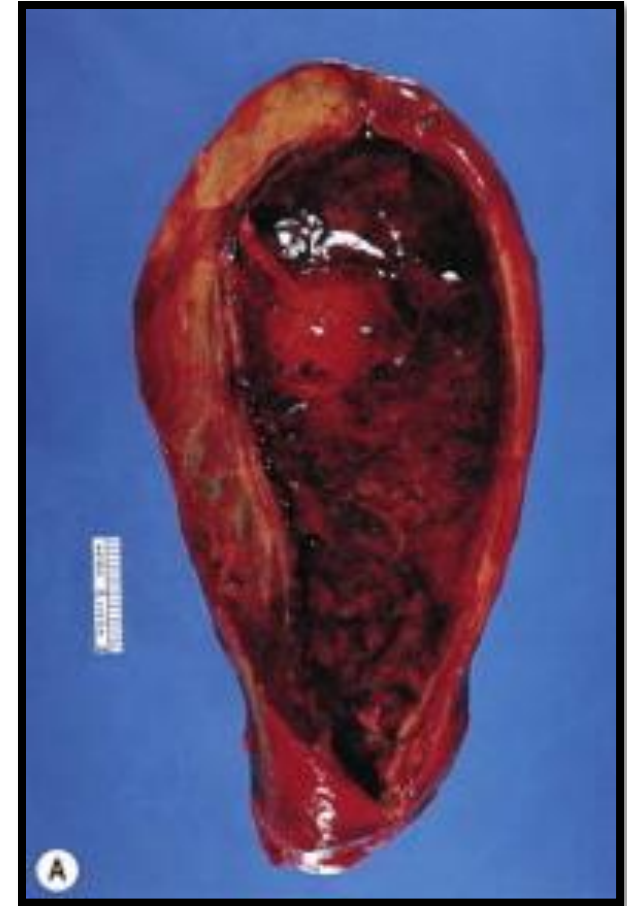
- A large stone eroding directly into an adjacent loop of small bowel, leading to intestinal obstruction

CHOLESTEROLOSIS

- STRAWBERRY GALLBLADDER

Acute cholecystitis

- Angry GB



Klatskin tumors

- Extrahepatic perihilar cholangiocarcinoma

THANK YOU