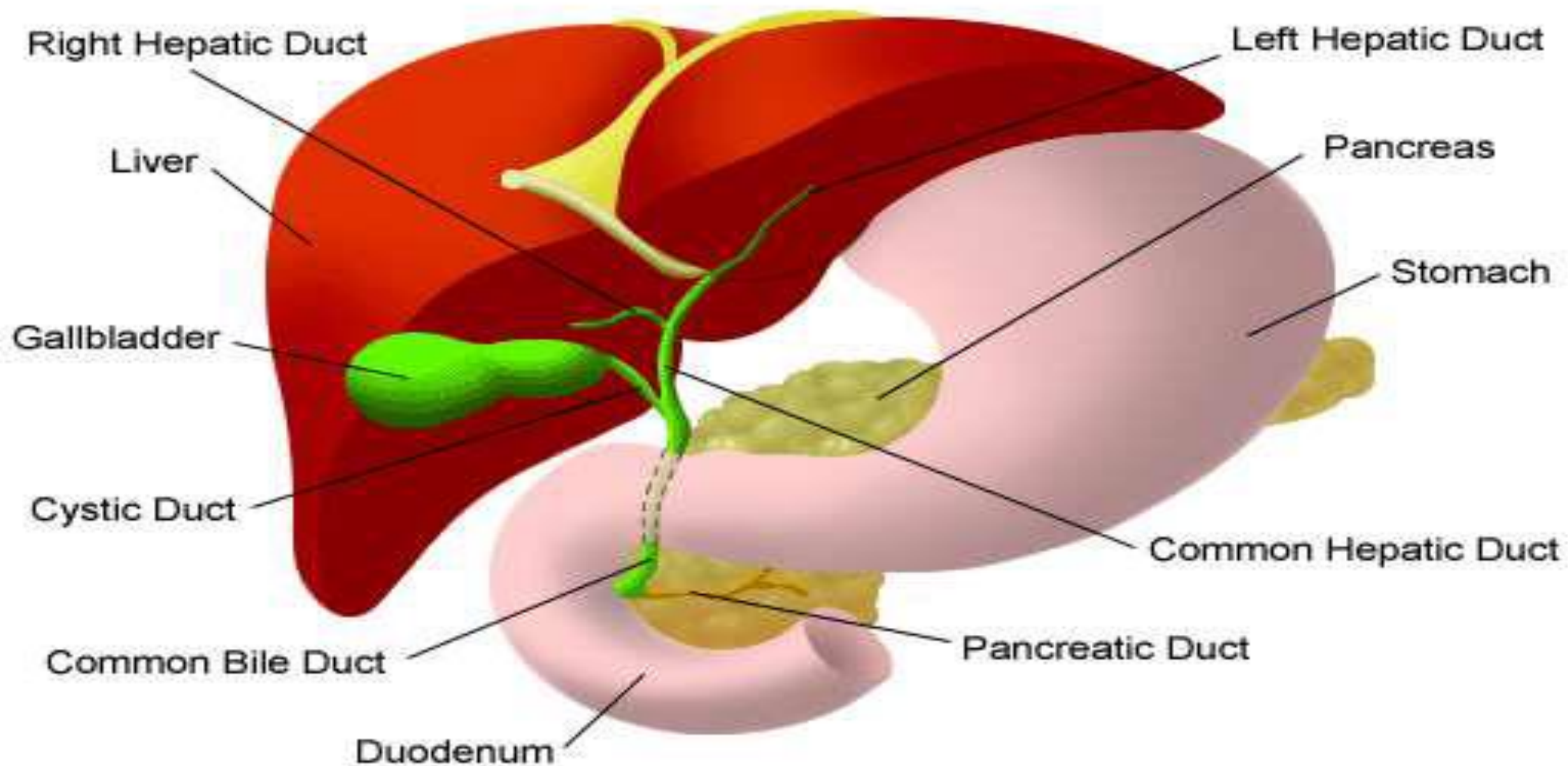


**PATHOLOGY OF THE
Liver, Gallbladder, and
Pancreas
PRACTICAL LAB.**

**DR.
AYSER HAMEED**

Biliary System



NORMAL ANATOMY

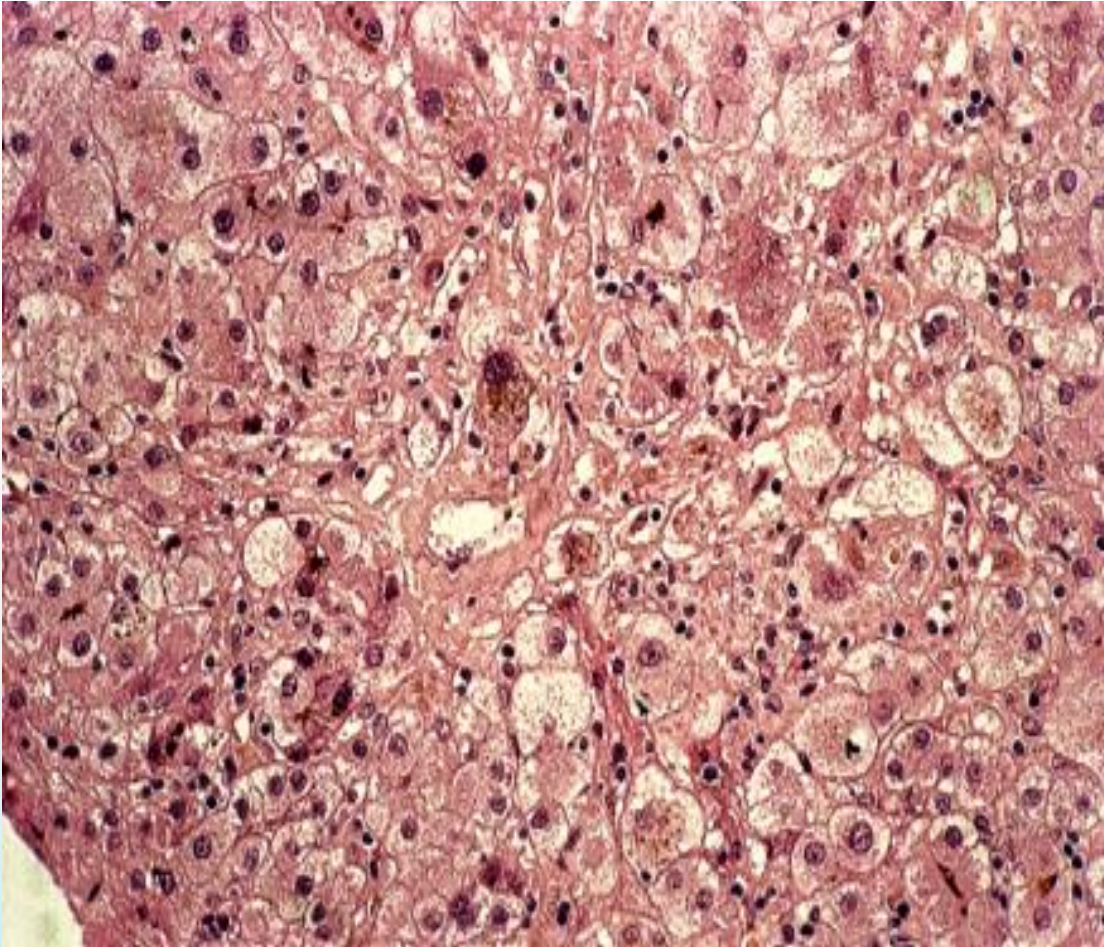


- External surface
- -red - brown
- - smooth
- - soft

General paranchymatous hepatic responses to liver injury

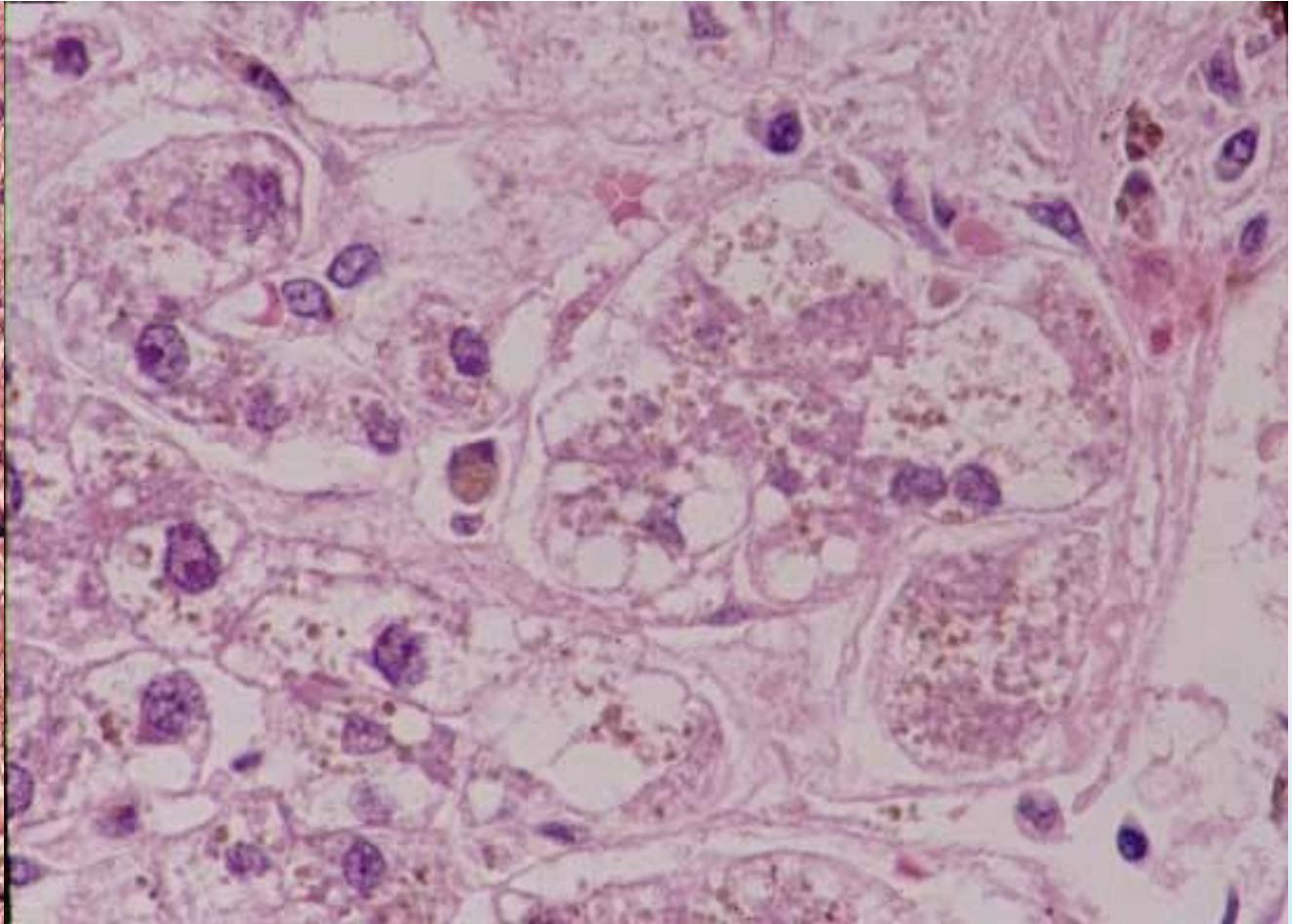
- 1- Inflammation (acute & chronic).**
- 2- Degeneration & intracellular accumulation.**
- 3- Necrosis and apoptosis.**
- 4- Regeneration.**
- 5- Fibrosis.**

Ballooning degeneration



Swelling or hydropic changes in hepatocytes due to defect in membrane or mitochondrial function

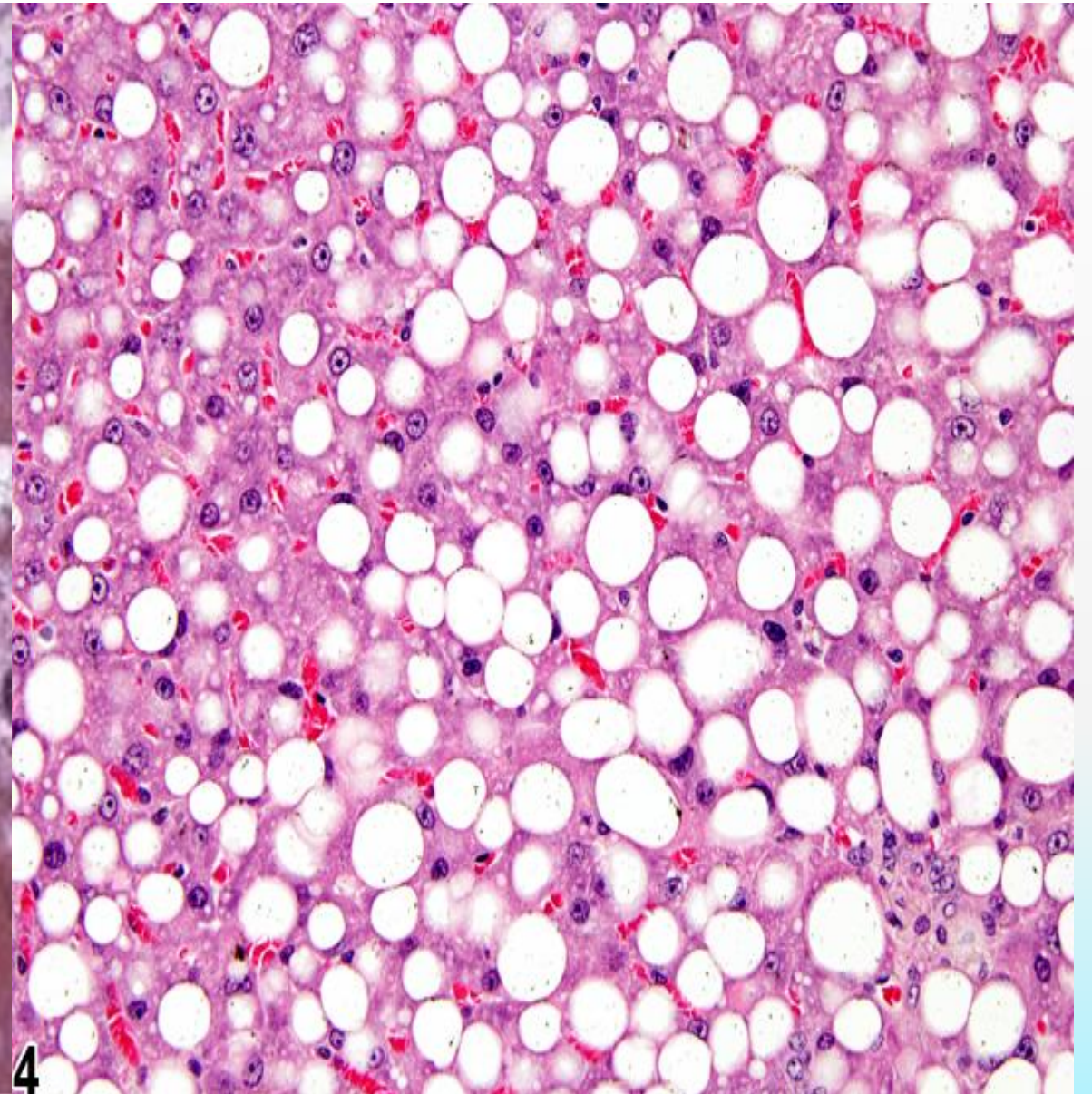
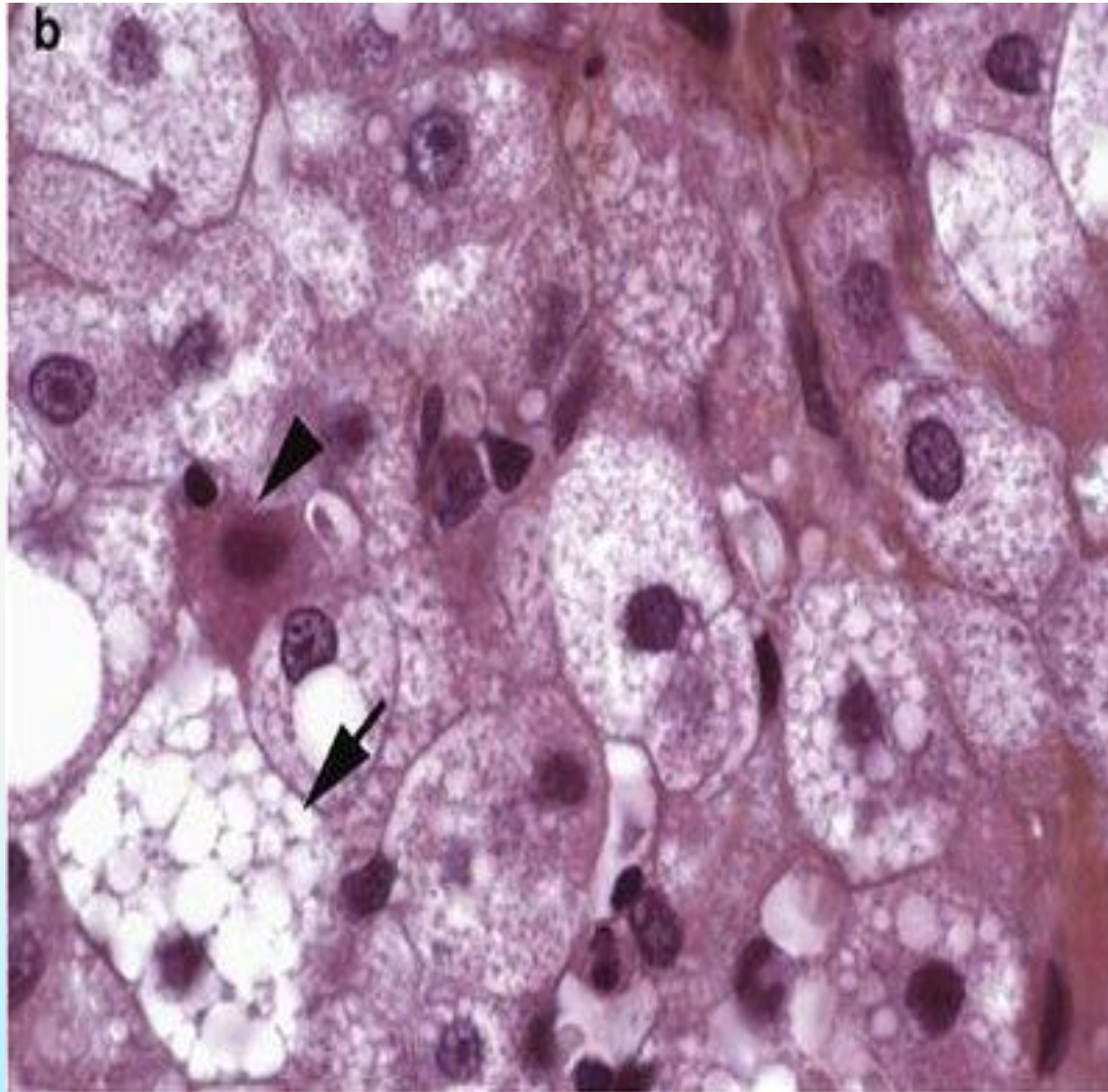
Feathery Degeneration

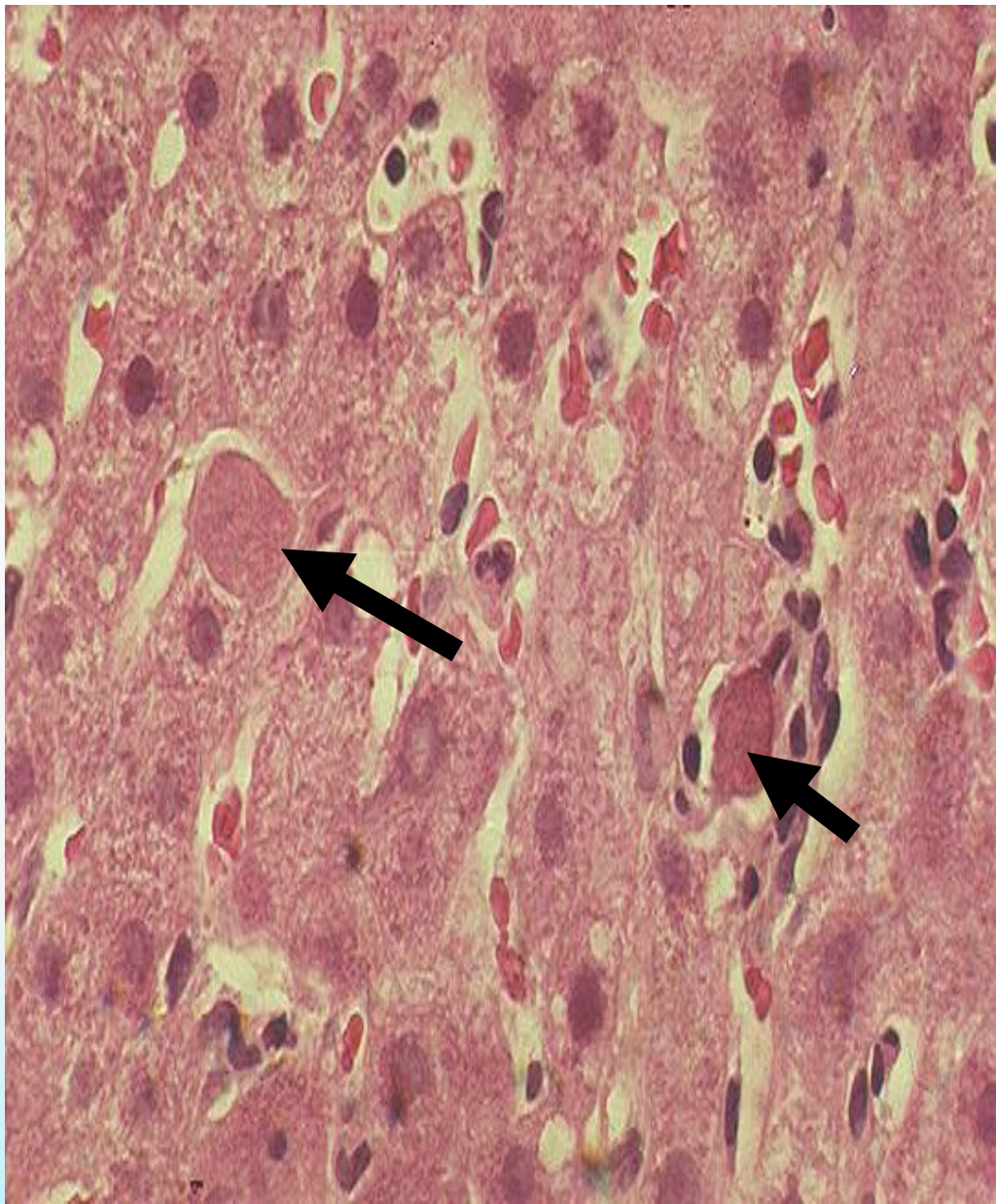


Foamy swollen hepatocytes due to retained pigment as Bile

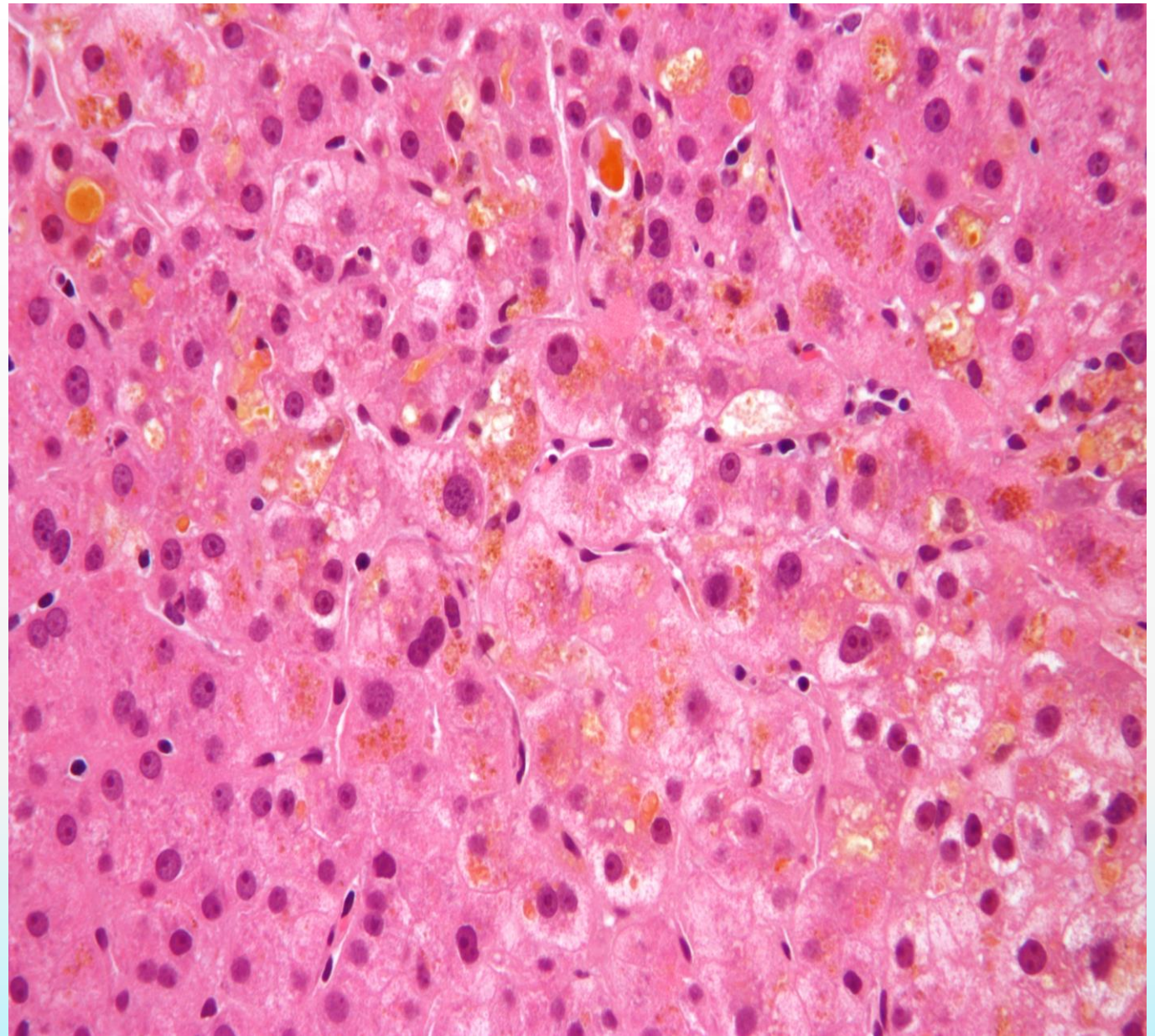
Microvesicular steatosis

Macrovesicular steatosis



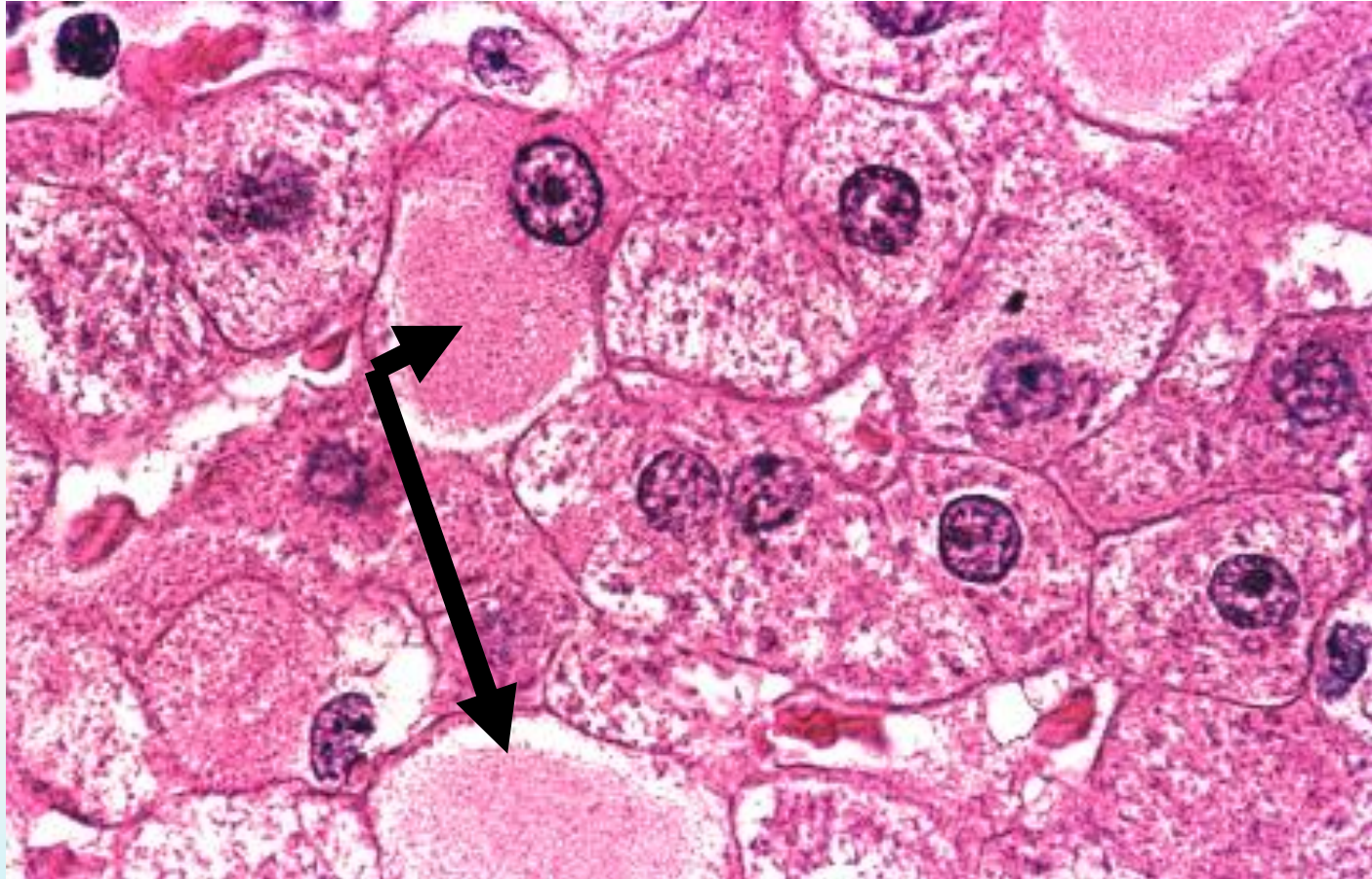


Apoptotic body



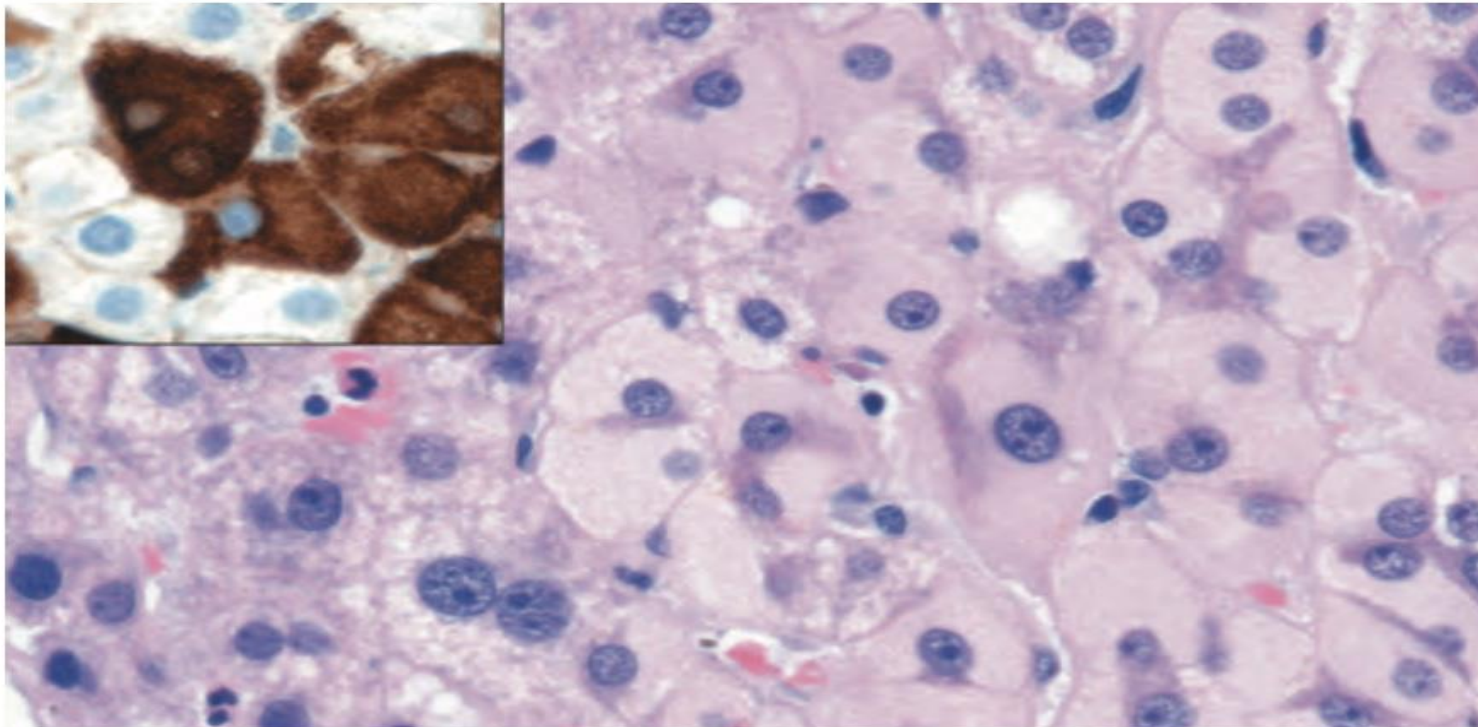
Cholestasis: deposition of bile in bile canaliculi appears as brownish deposits

Chronic viral hepatitis B showing ground glass hepatocytes

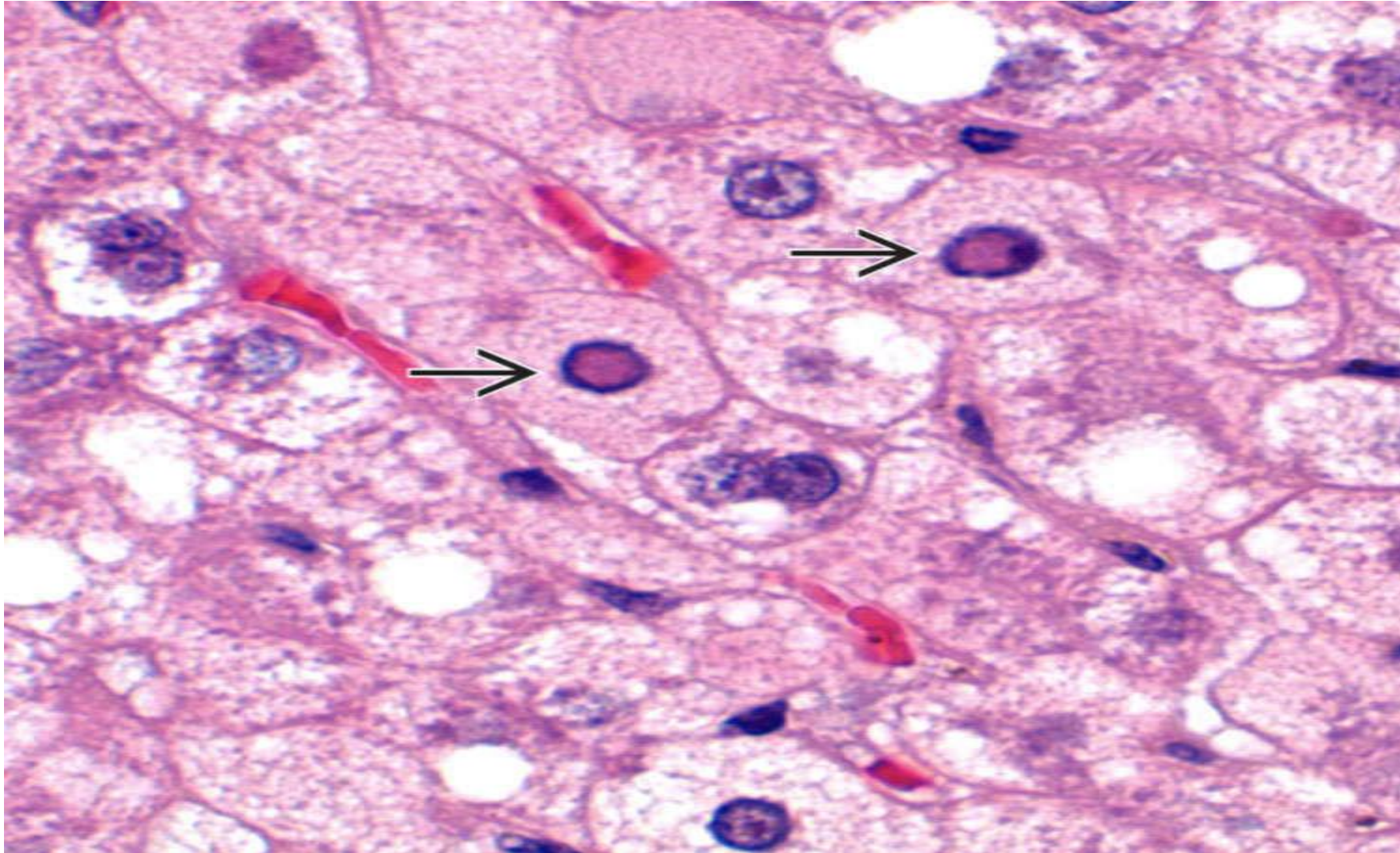


Ground glass hepatocytes, characterized by more pale, eosinophilic, and homogeneous cytoplasm than surrounding normal (more granular) hepatocytes. Note (artifactual) cleft between "ground glass" cytoplasm and hepatocellular cell membrane. The change corresponds to extensive endoplasmic reticulum hyperplasia and massive accumulation of HBsAg. (H&E)

- **Ground-glass hepatocytes** in chronic hepatitis B caused by accumulation of hepatitis B surface antigen in the endoplasmic reticulum. The cytoplasmic inclusions are light pink and finely granular on hematoxylin and eosin staining; immunostaining (*inset*) confirms that they contain hepatitis B surface antigen (*brown*)

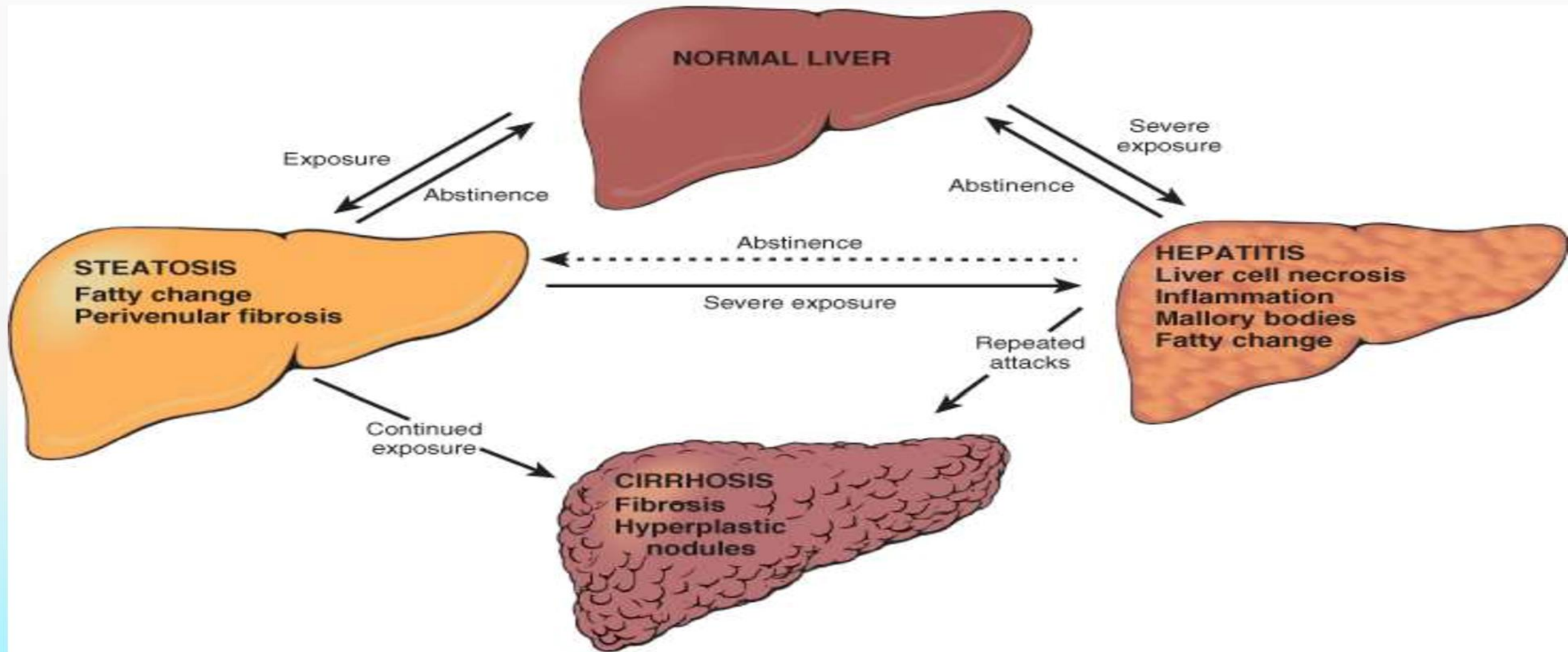


Sanded Nuclei Hepatitis B-infected hepatocytes may have pale pink, finely granular intranuclear inclusions (sanded nuclei image)



TOXIN-INDUCED LIVER DISEASE

ALCOHOLIC LIVER DISEASE



ALCOHOLIC LIVER DISEASE

(fatty changes)

Steatosis

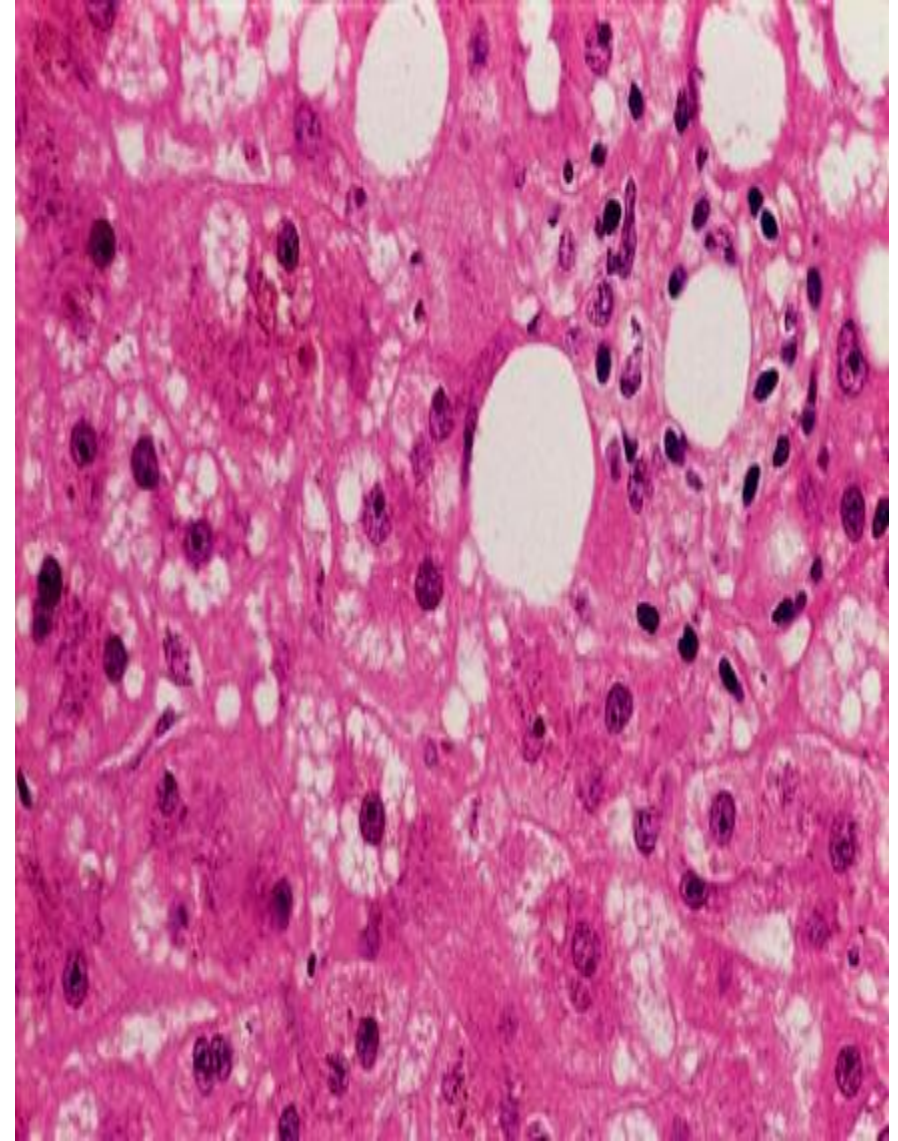
**Lipid droplets
accumulate in
hepatocytes**

2 histologic types:

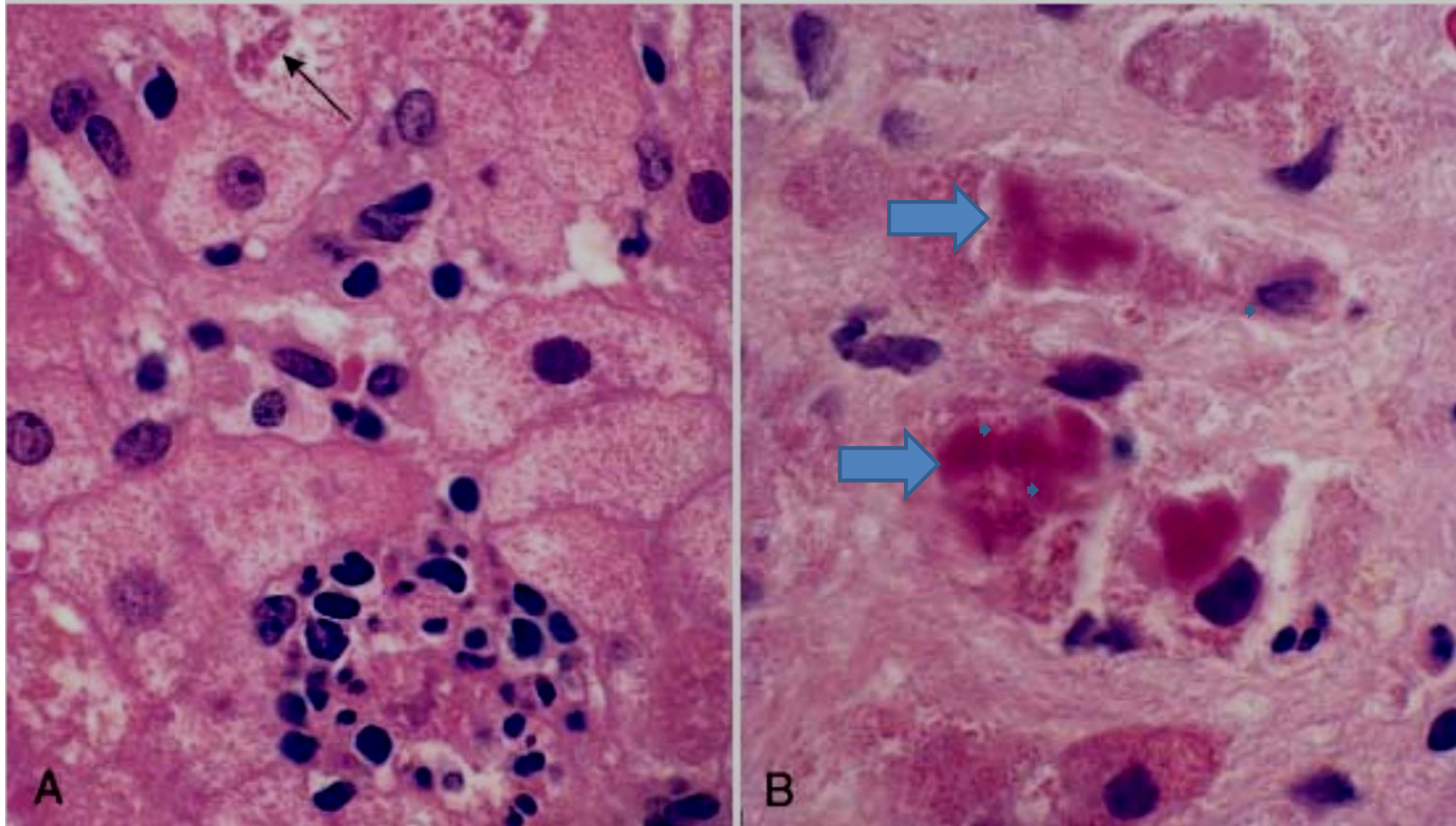
Microvesicular

Macrovesicular

**Completely reversible if
there is abstinence**



MALLORY'S bodies: eosinophilic cytoplasmic inclusions (cytokeratin intermediate filaments) occur in alcoholics

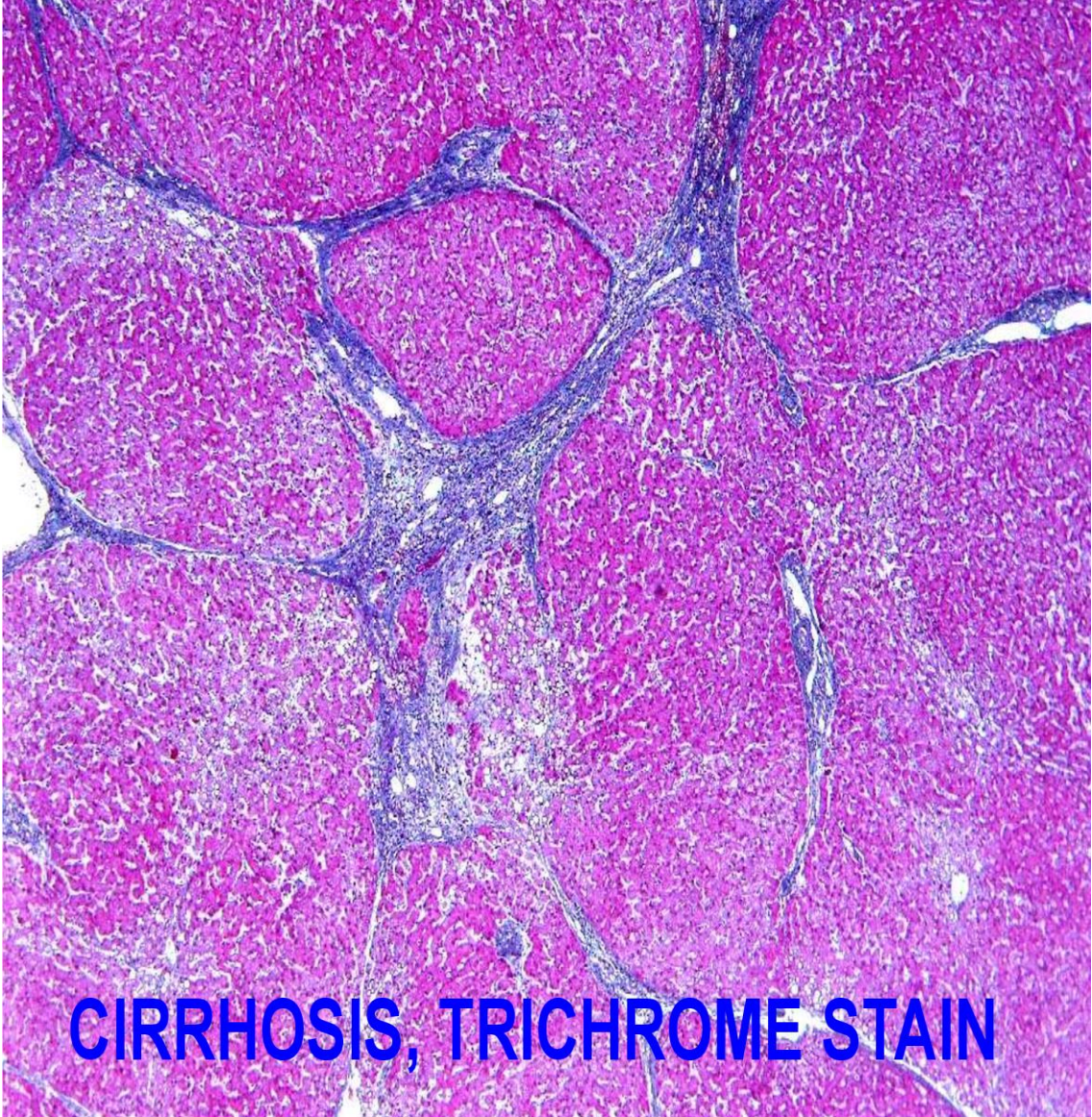
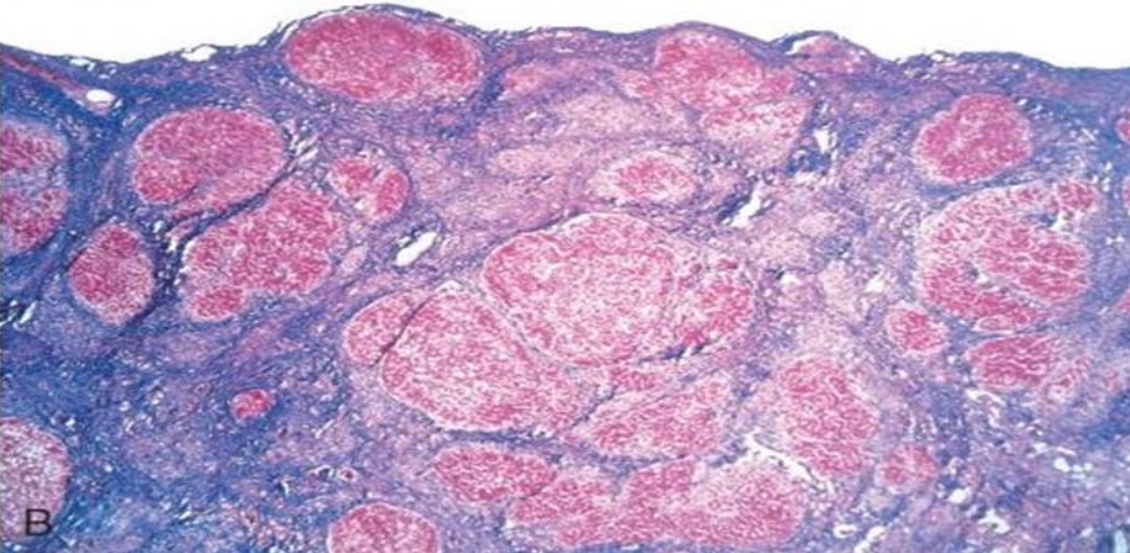


❑ Cirrhosis is the morphologic change most often associated with chronic liver disease; it refers to the diffuse transformation of the liver into regenerative parenchymal nodules surrounded by fibrous bands.

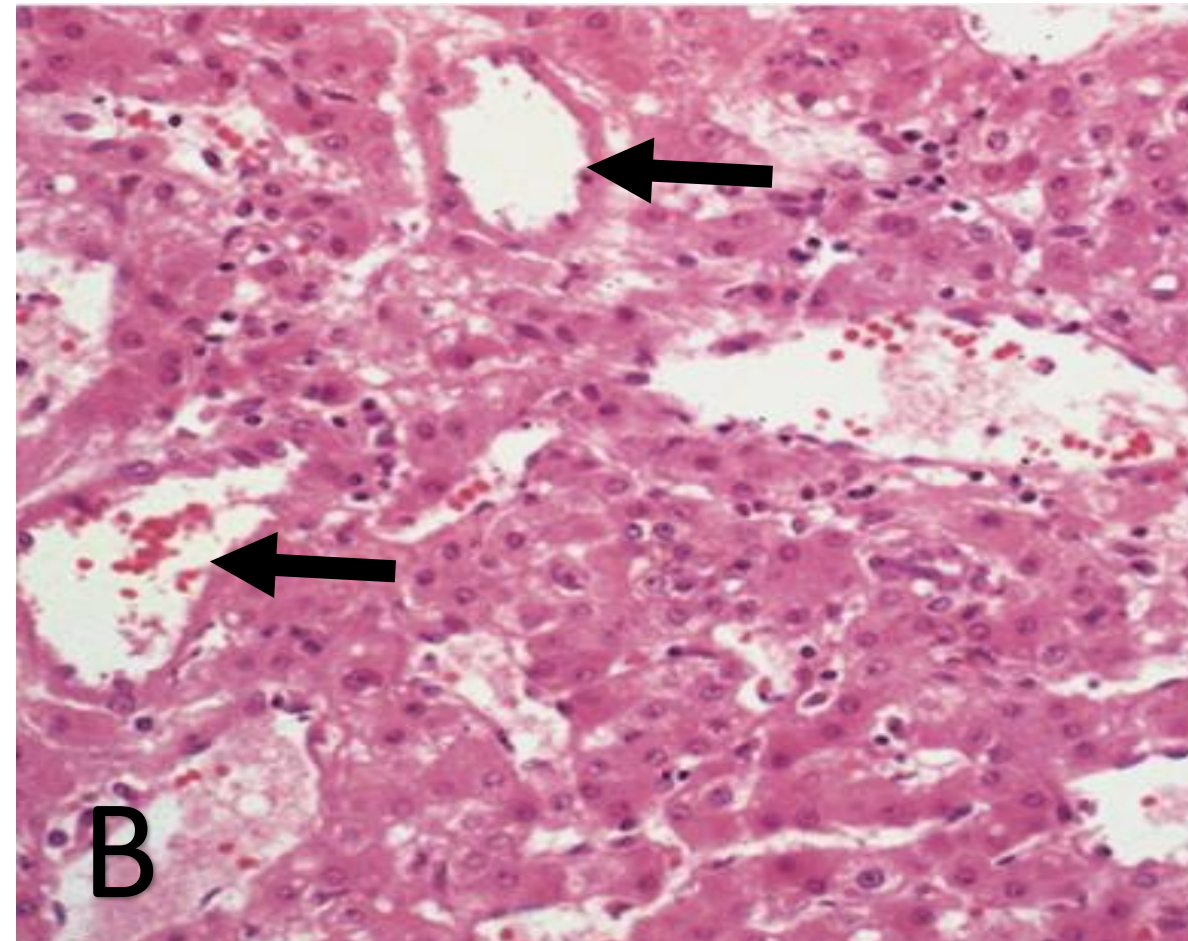
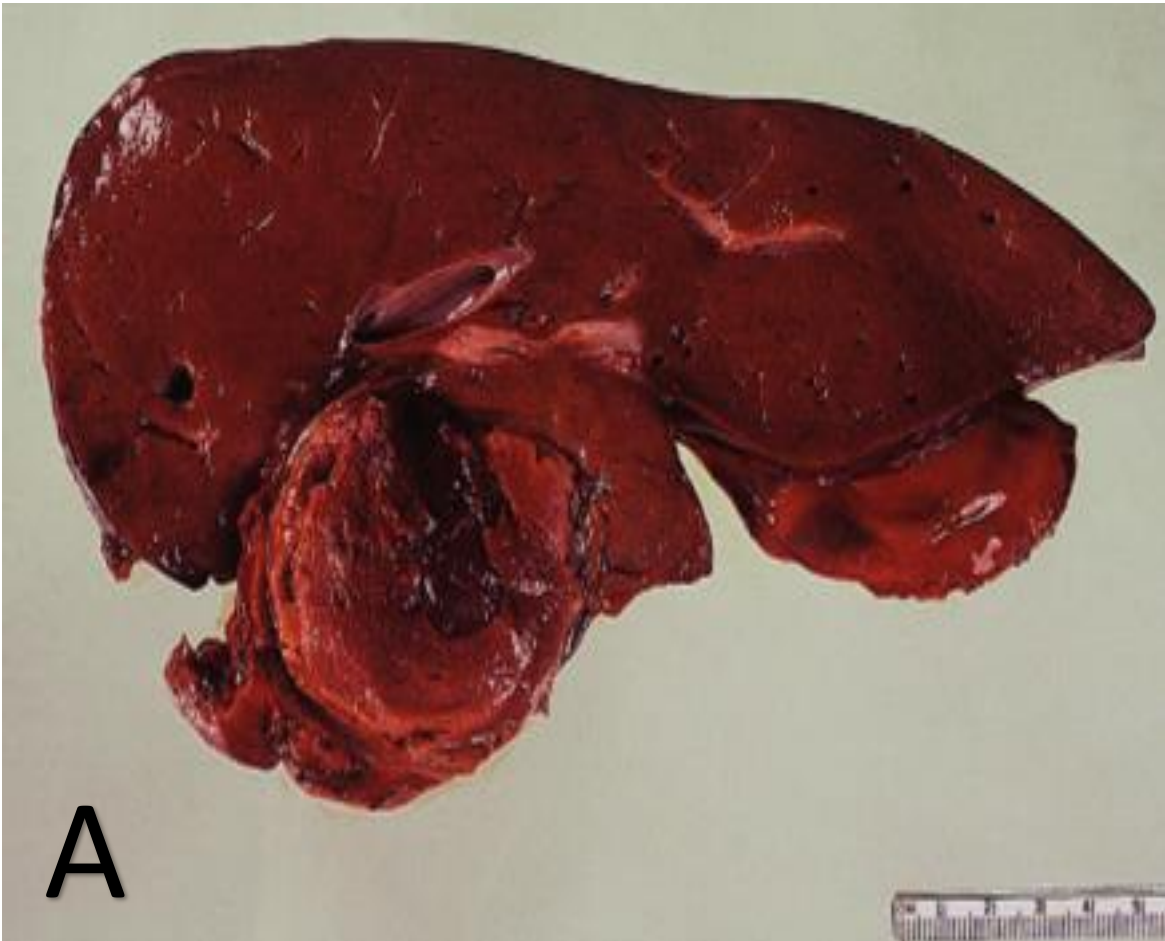
❑ Causes:

- ✓ **Long-term alcohol abuse.**
- ✓ **Ongoing viral hepatitis (hepatitis B, C and D).**
- ✓ **Nonalcoholic fatty liver disease, a condition in which fat accumulates in the liver.**
- ✓ **Hemochromatosis, a condition that causes iron buildup in the body.**
- ✓ **Autoimmune hepatitis, which is a liver disease caused by the body's immune system.**
- ✓ **Destruction of the bile ducts caused by primary biliary cholangitis.**
- ✓ **Hardening and scarring of the bile ducts caused by primary sclerosing cholangitis.**
- ✓ **Wilson's disease, a condition in which copper accumulates in the liver.**
- ✓ **Cystic fibrosis.**
- ✓ **Alpha-1 antitrypsin deficiency.**

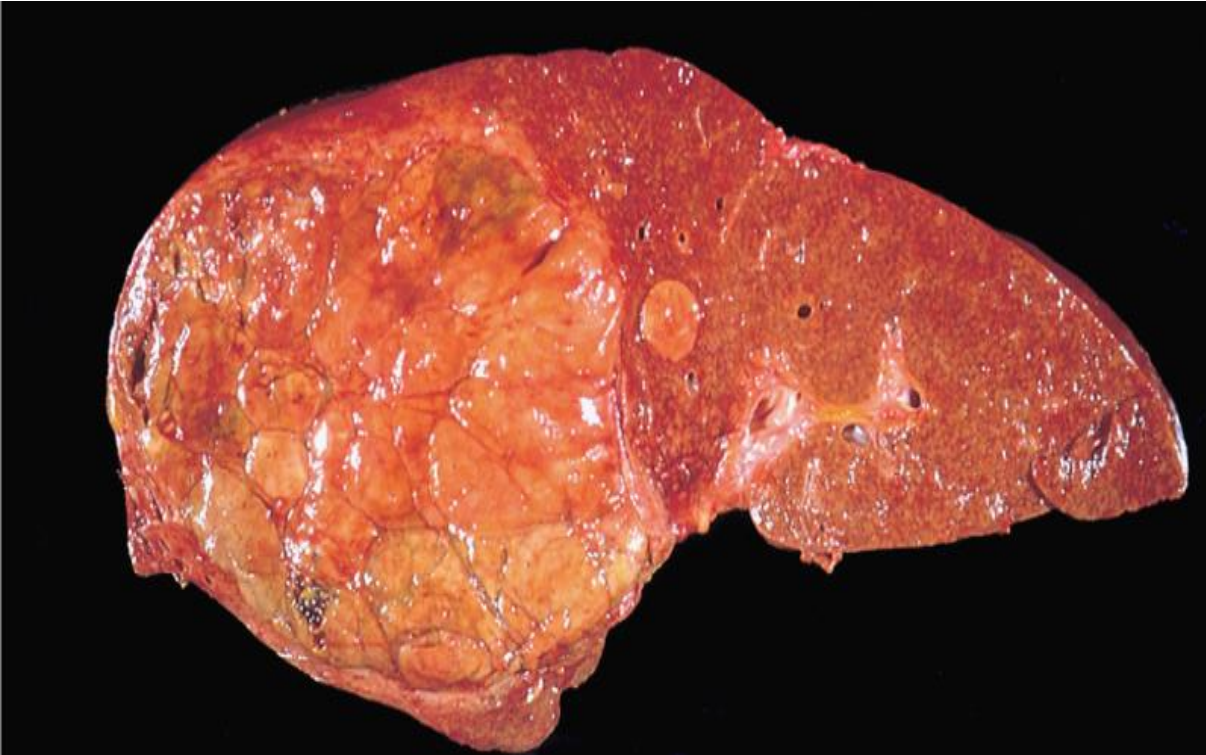
cirrhosis



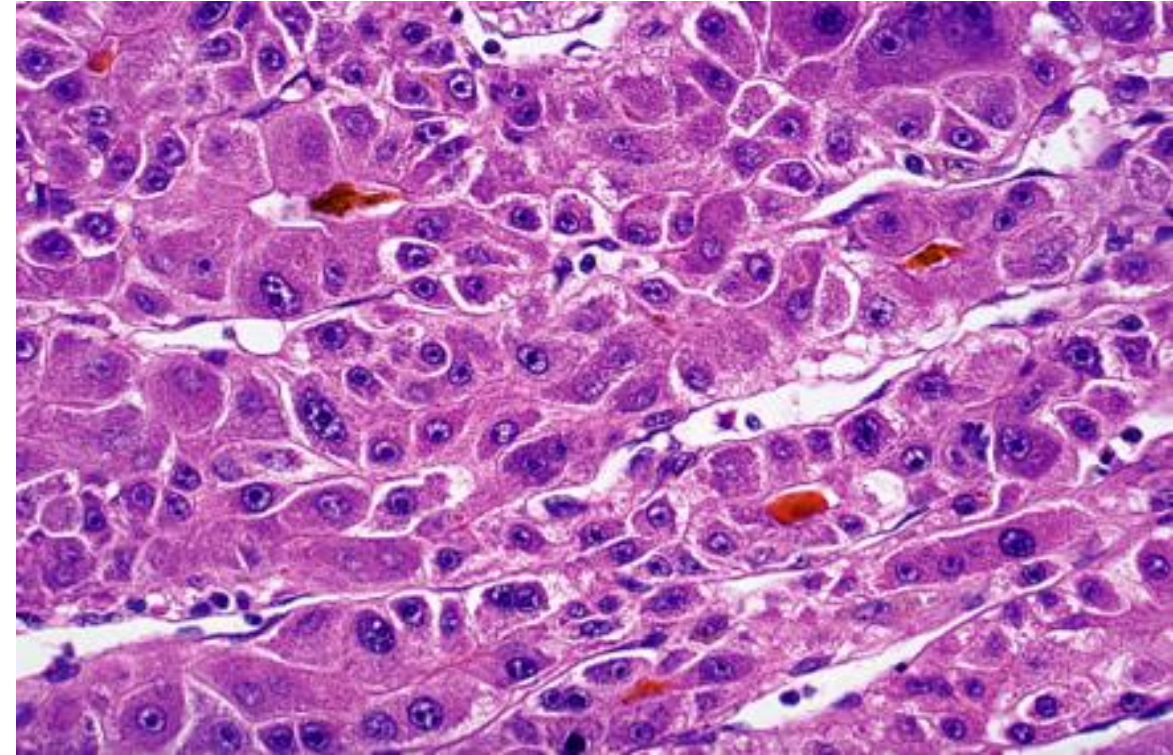
Liver cell adenoma. (A) Resected specimen of the liver mass. (B) Microscopic view showing broad cords of hepatocytes, with an arterial vascular supply (arrow) and no portal tracts.



Hepatocellular carcinoma(HCC)



unifocal (massive single tumor).

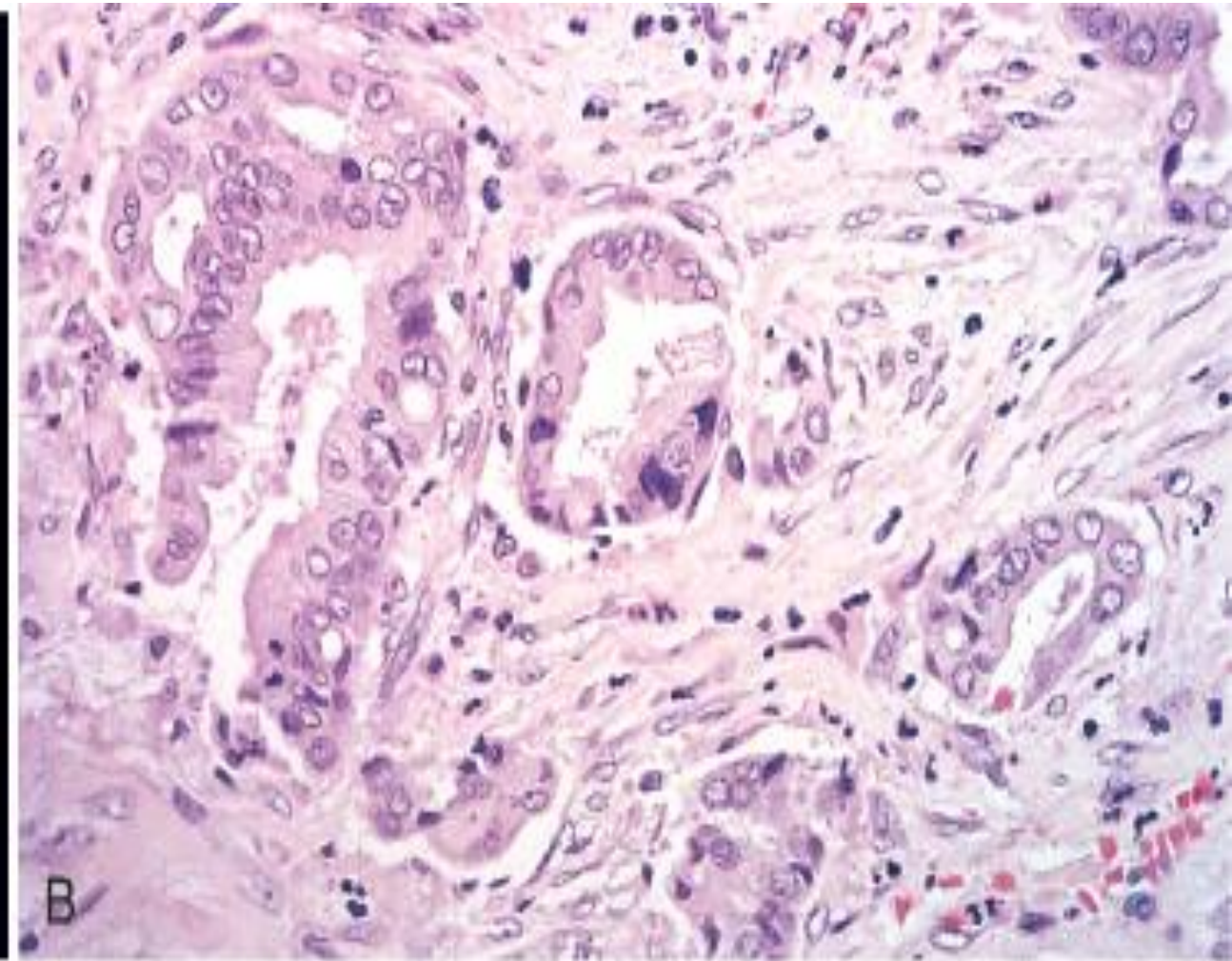


. Well-differentiated HCCs are composed of cells that look like normal hepatocytes and grow as thick trabeculae

*HCC ranges from **well differentiated carcinoma** that reproduces hepatocytes arranged in cords or small nests. **To poorly differentiated lesion** which often made up of large multinucleated anaplastic tumor cells.*

Cholangiocarcinoma gross and mic

Invasive malignant glands in a reactive, sclerotic stroma.



Cholesterol stones :

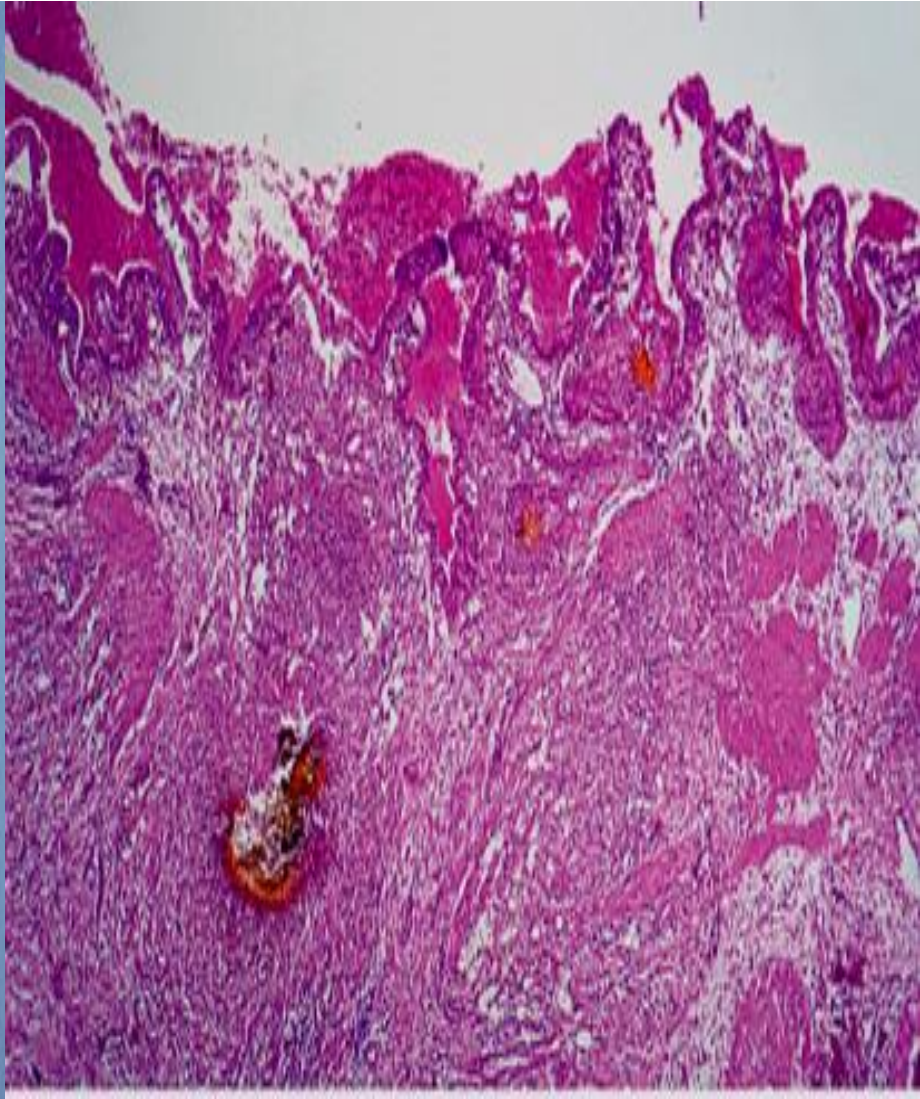
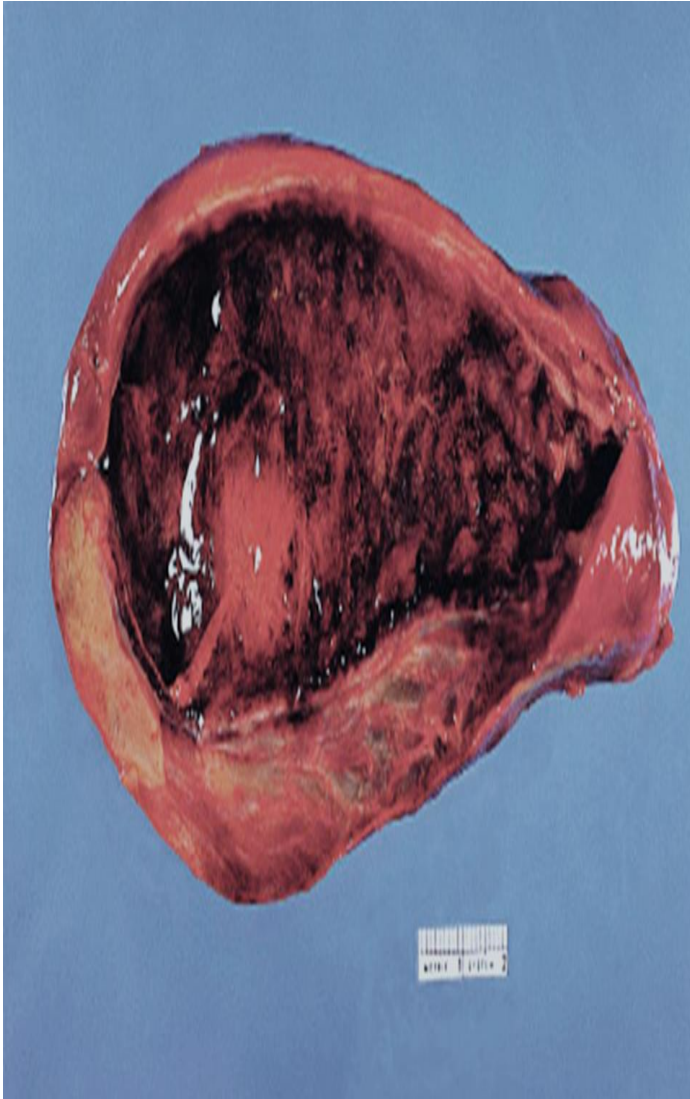
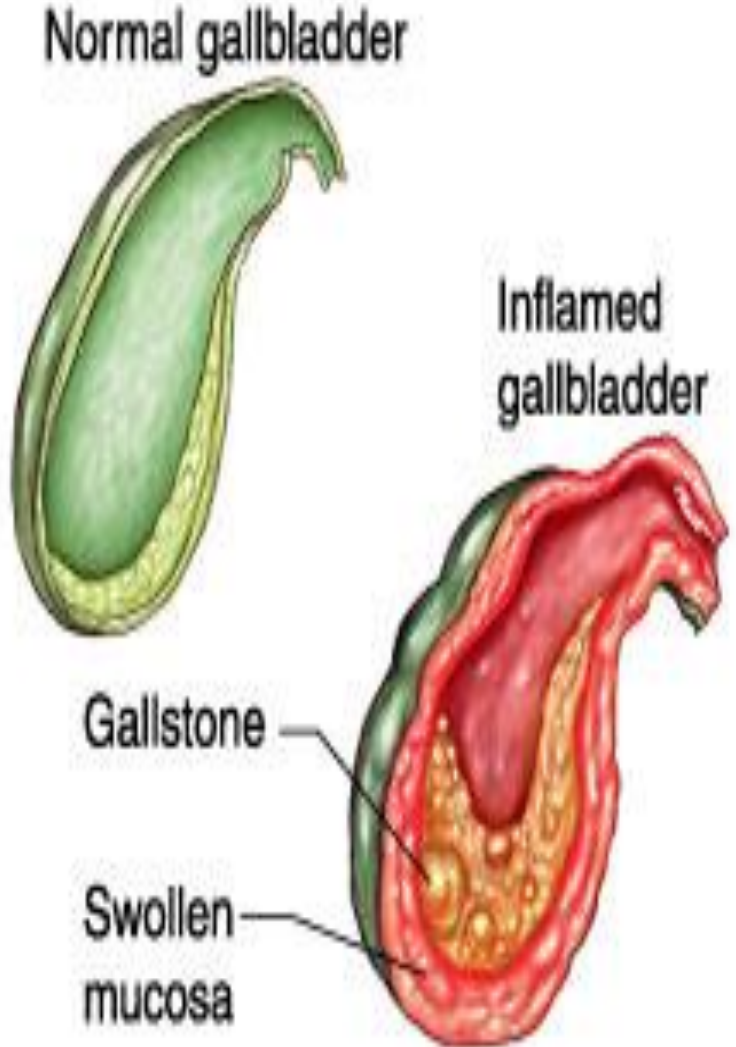
- Gross :
- Pure pale yellow, ovoid, firm, single to multiple with faceted surfaces mostly radiolucent,
- Mixed :20% is radio opaque due to the presence of calcium carbonate content.

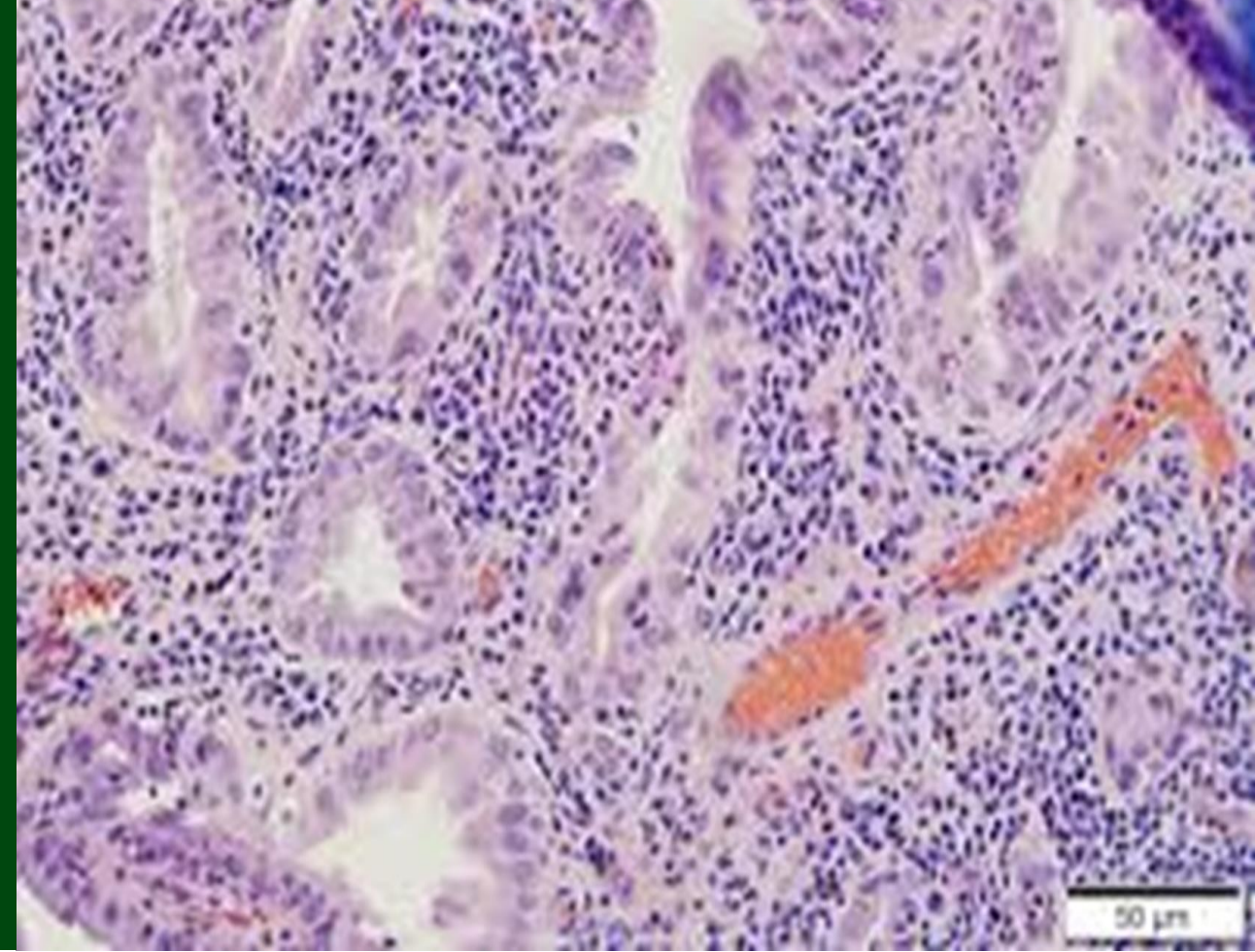


• Pigment stones

- Black stone (in sterile gall bladder)small size, fragile to touch, numerous, 50-70% are radioopaque
- Brown stone (in infected intrahepatic or extrahepatic ducts)- single to a few, soft, greasy,.

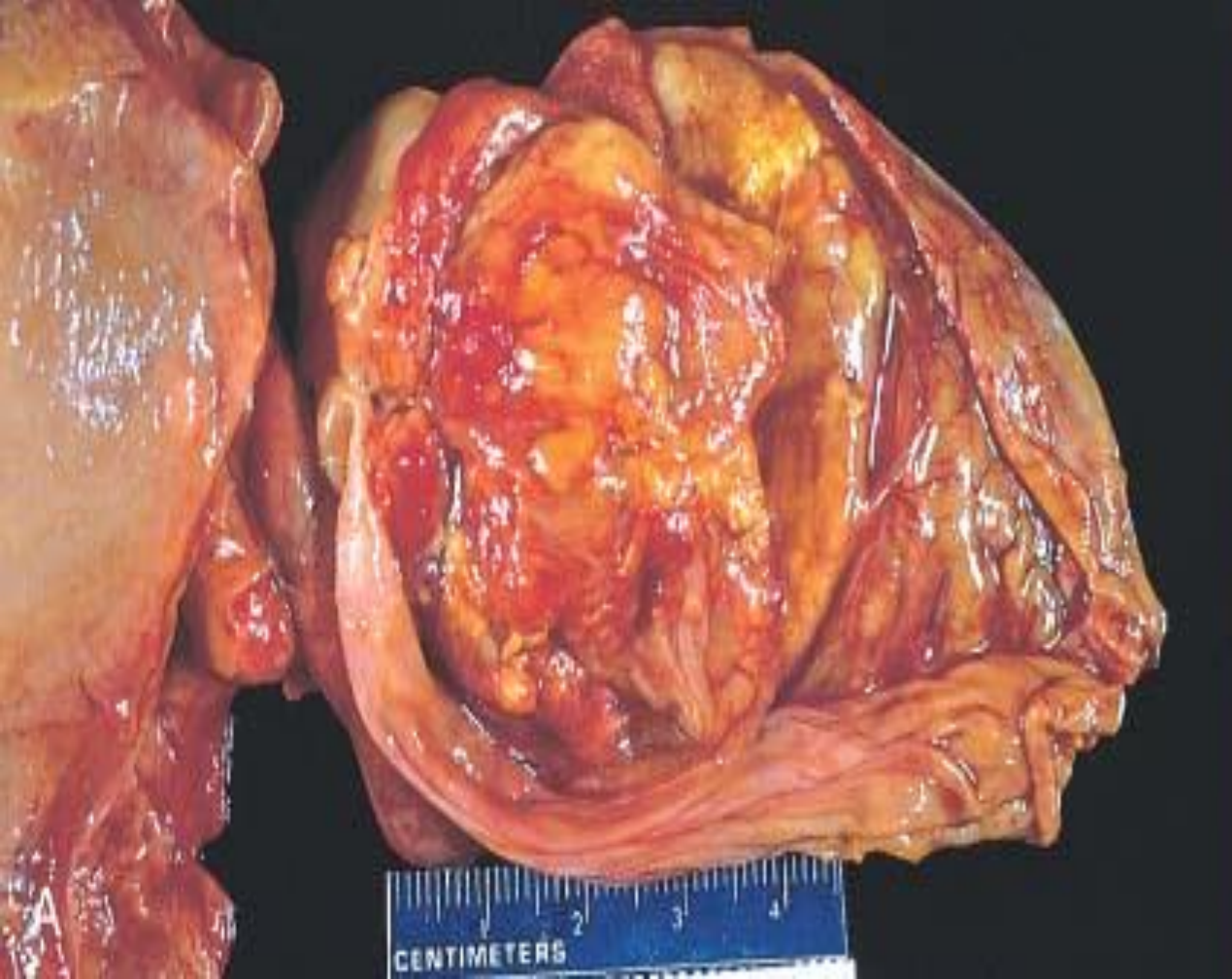
Acute cholecystitis, there is vascular congestion ,hemorrhage in the wall and then mucosal & mural necrosis with neutrophils infiltrate



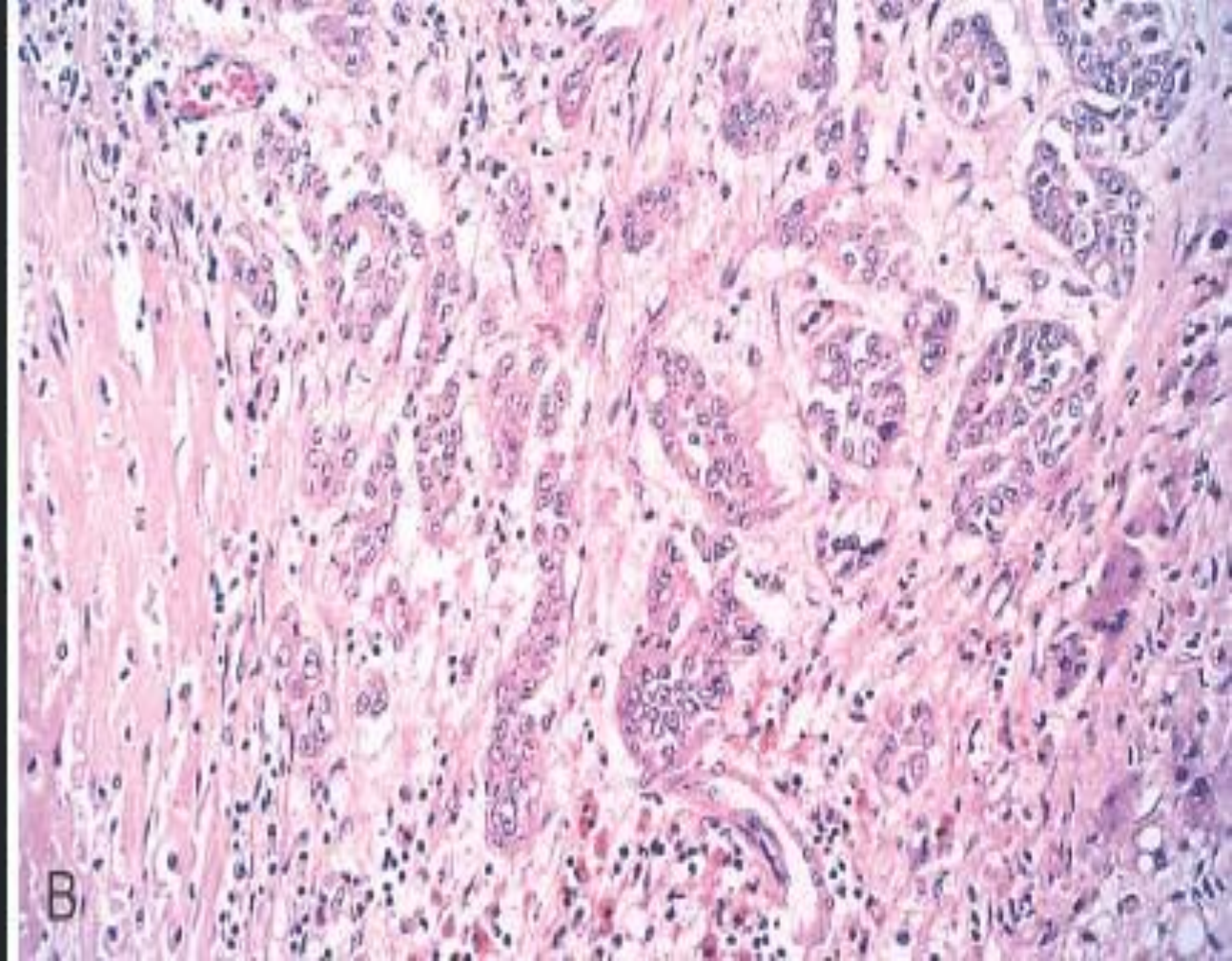


Chronic cholecystitis: The gallbladder may be contracted, of normal size, or enlarged. Mucosal ulcerations are infrequent ; the sub mucosa and sub serosa often are thickened from fibrosis.

collections of lymphocytes in the wall

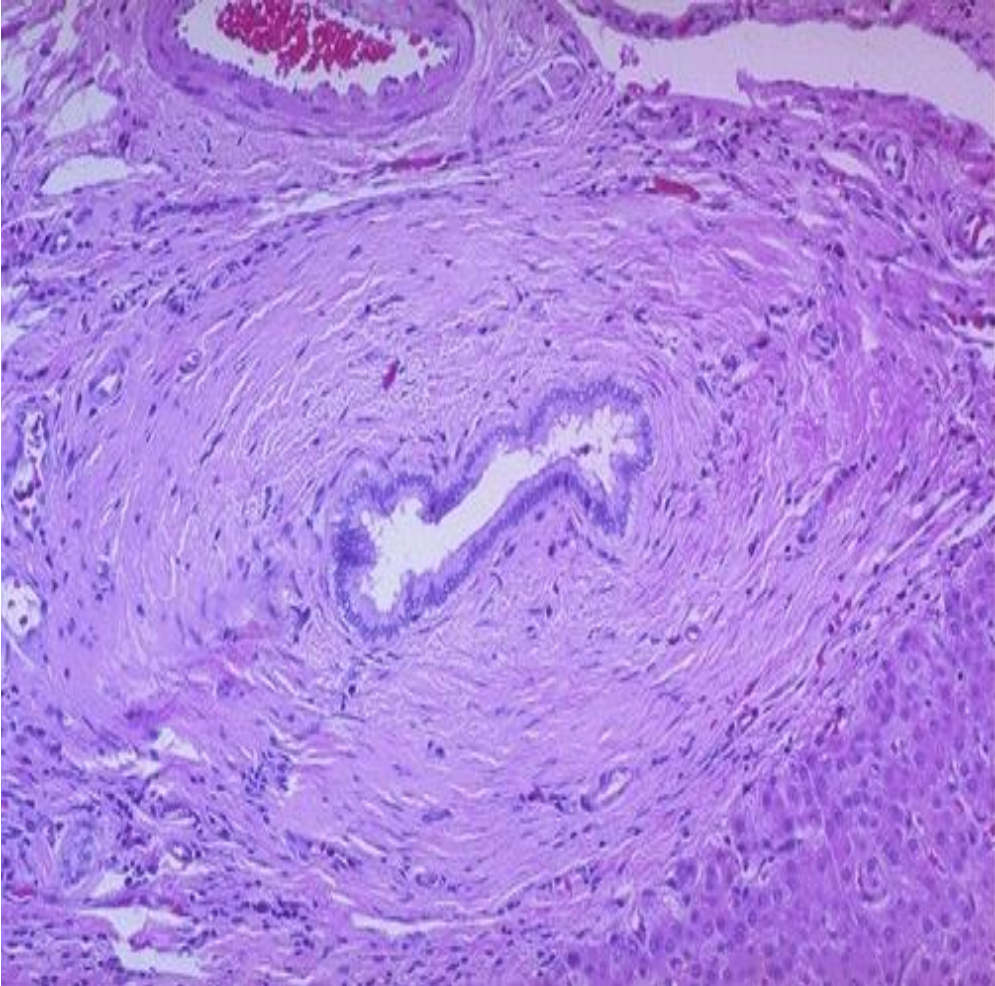
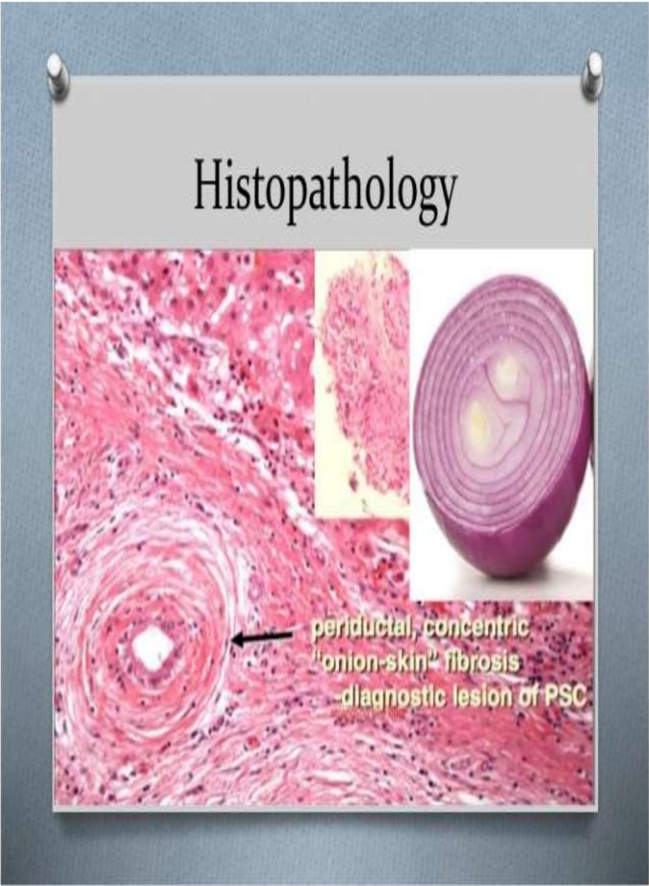


Adenocarcinoma of the gallbladder
Carcinomas of the gallbladder show exophytic growth



Most carcinomas of the gallbladder are adenocarcinomas.

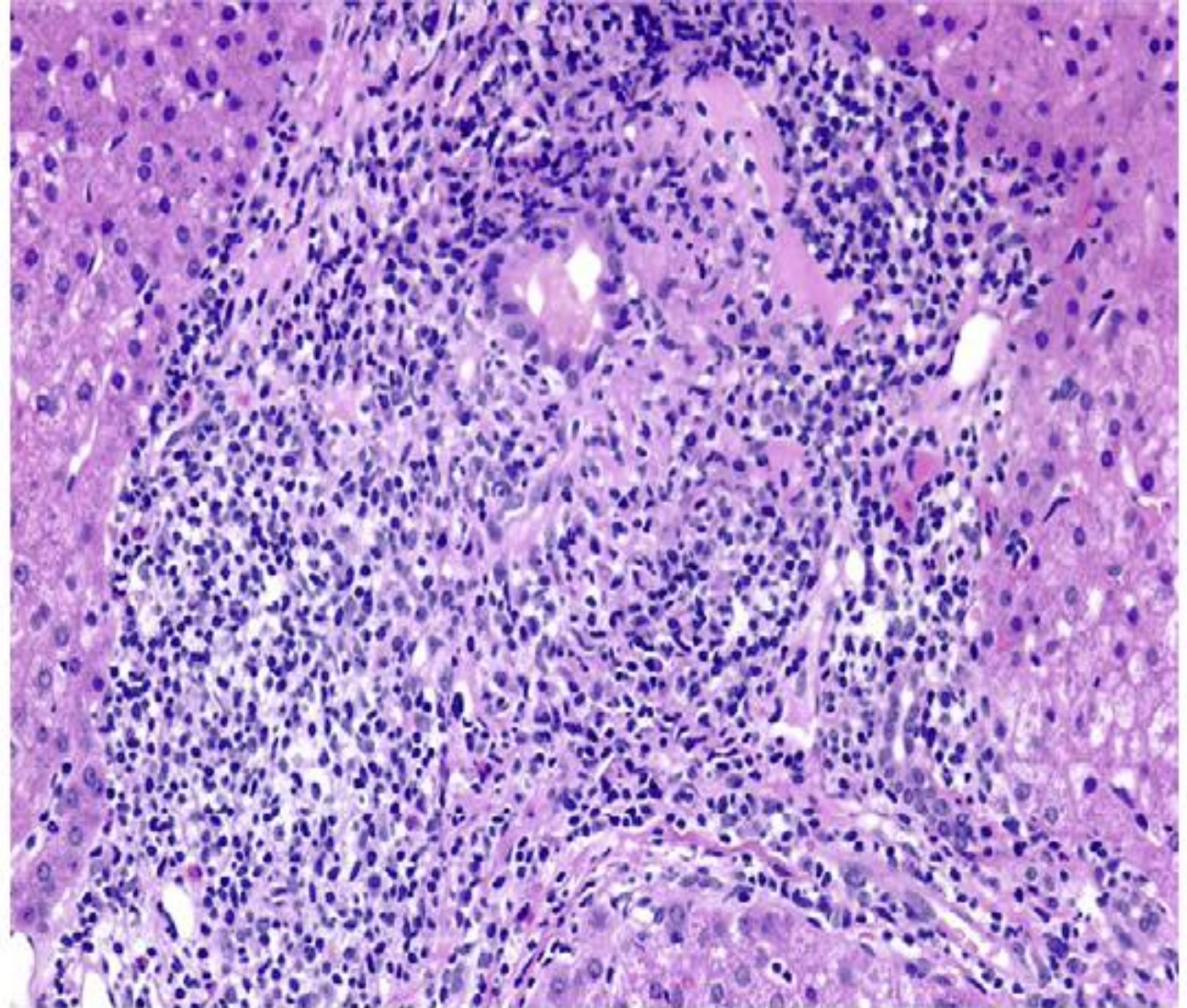
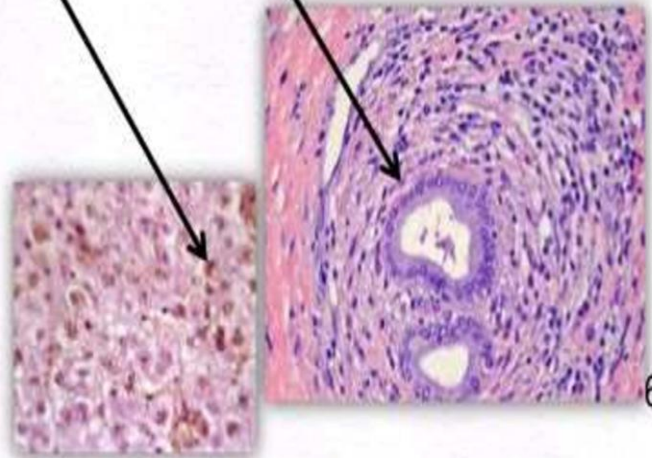
Primary sclerosing cholangitis (PSC) is characterized by inflammation and obliterative fibrosis of intrahepatic and extra hepatic bile ducts, leading to dilation of preserved segments. Irregular biliary strictures and dilations cause the characteristic “beading” of the intrahepatic and extra hepatic biliary tree seen by MRI.



Primary biliary cirrhosis (PBC) is an autoimmune disease whose primary feature is nonsuppurative, inflammatory destruction of small- and medium-sized intrahepatic bile ducts.

Primary Biliary Cirrhosis

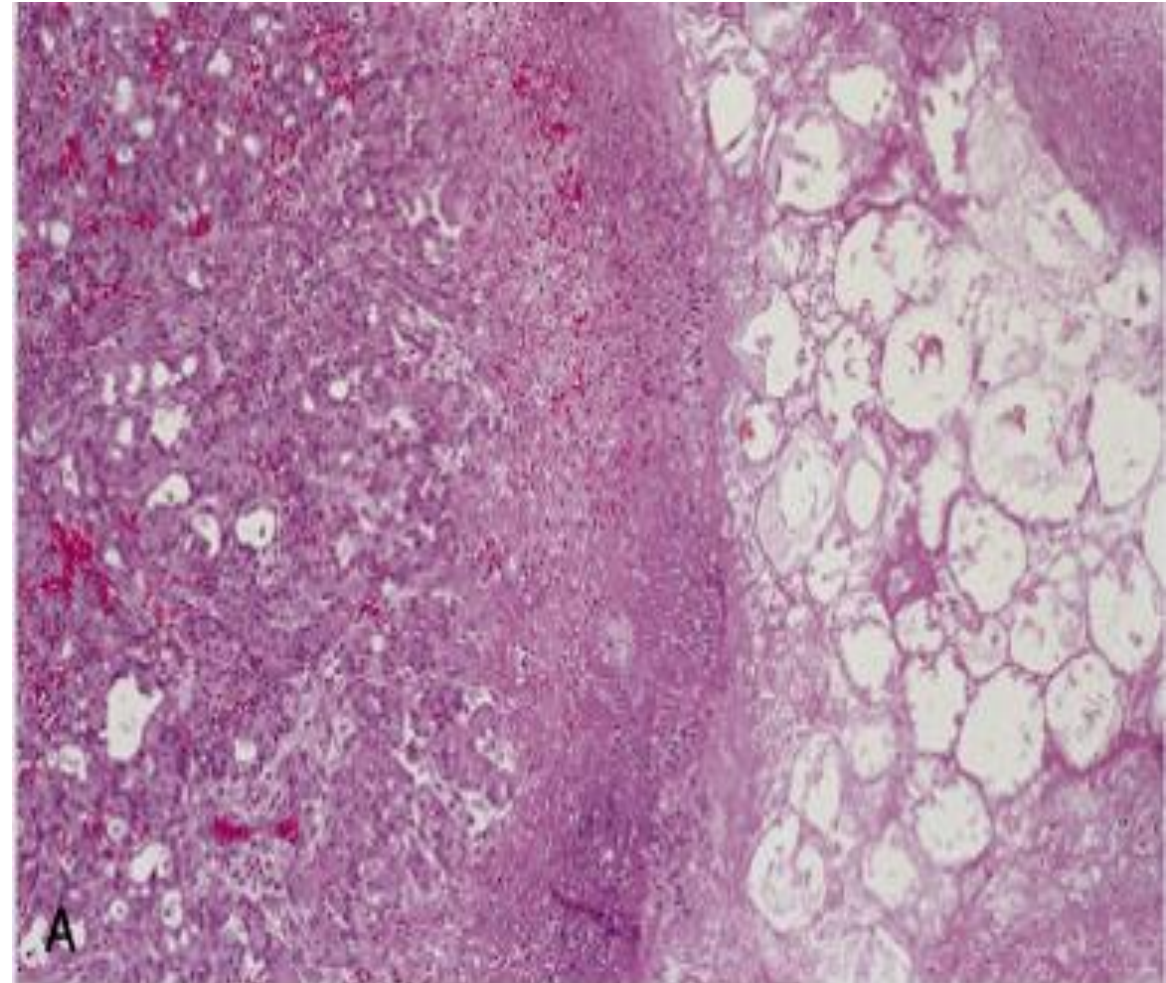
- Autoimmune.
- Females 6:1.
- Pruritis, jaundice, hepatosplenomegaly (initial).
- Intrahepatic Bile duct inflammation
- Cholestasis (bile stained liver)



Acute pancreatitis. The pancreas has been sectioned longitudinally to reveal dark areas of hemorrhage in the pancreatic substance and a focal area of pale fat necrosis in the peripancreatic fat (upper left).



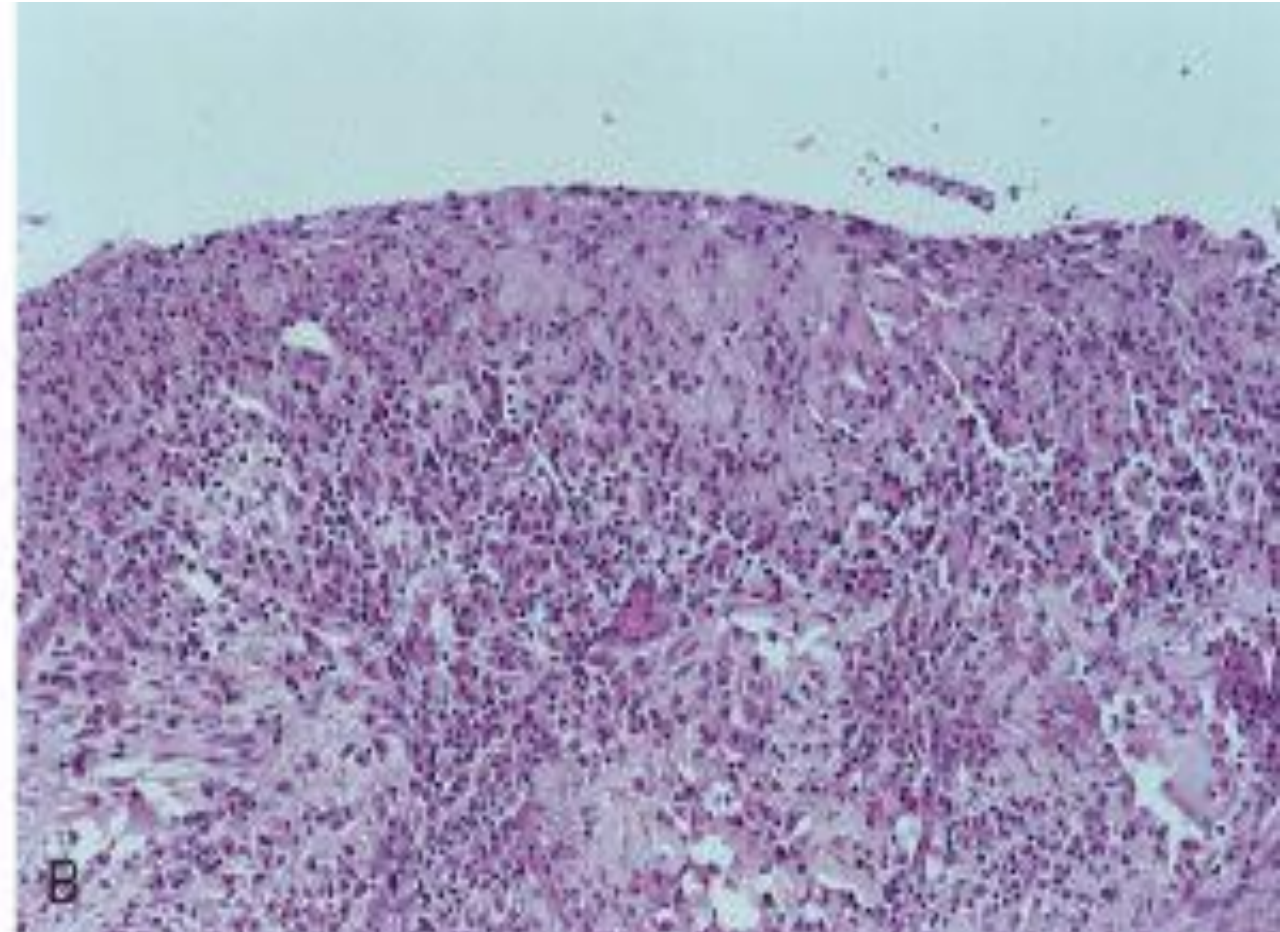
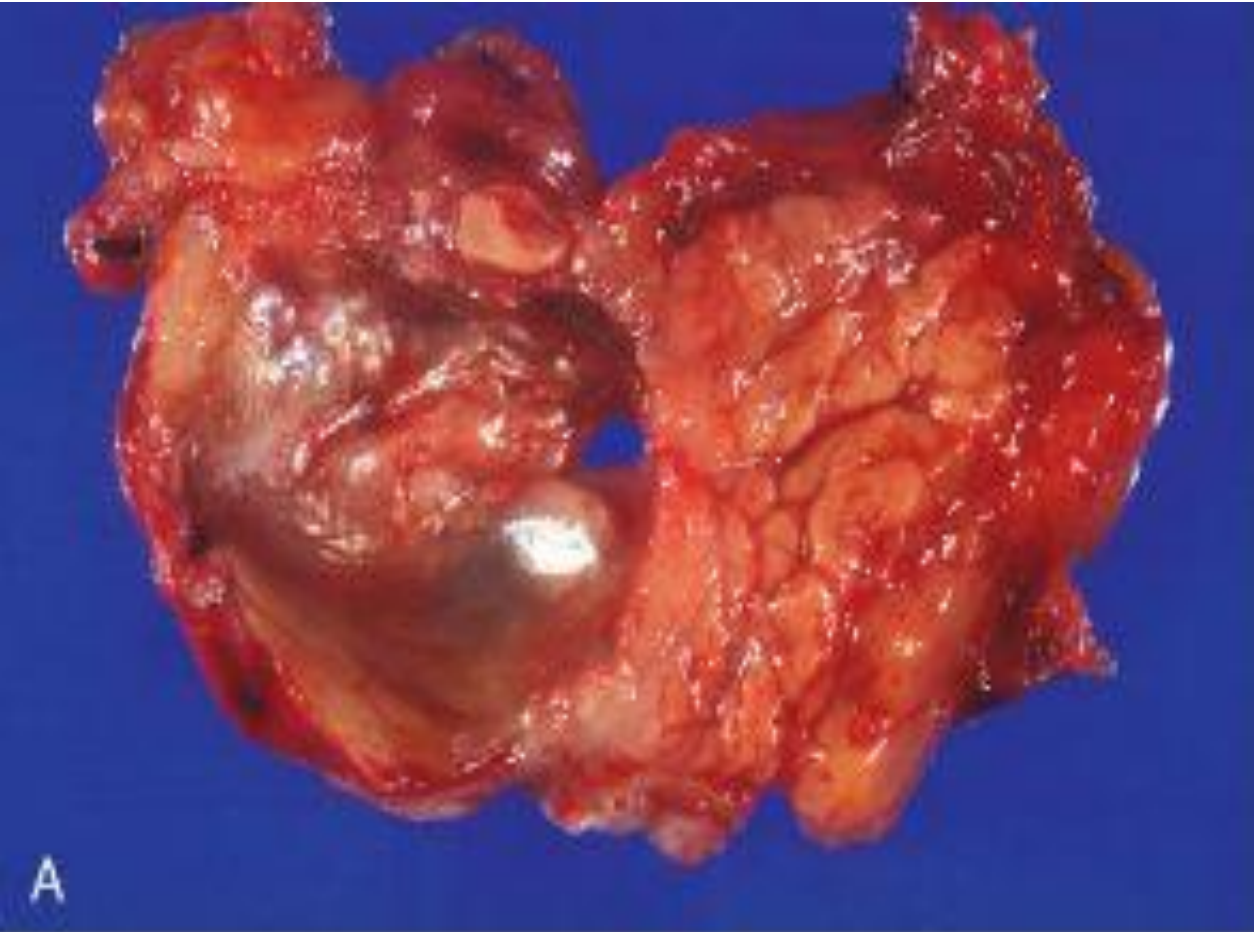
Acute pancreatitis. The microscopic field shows a region of fat necrosis (right) and focal pancreatic parenchymal necrosis (center).



Pancreatic pseudocyst.

(A) Cross-section revealing a poorly defined cyst with a necrotic brownish wall.

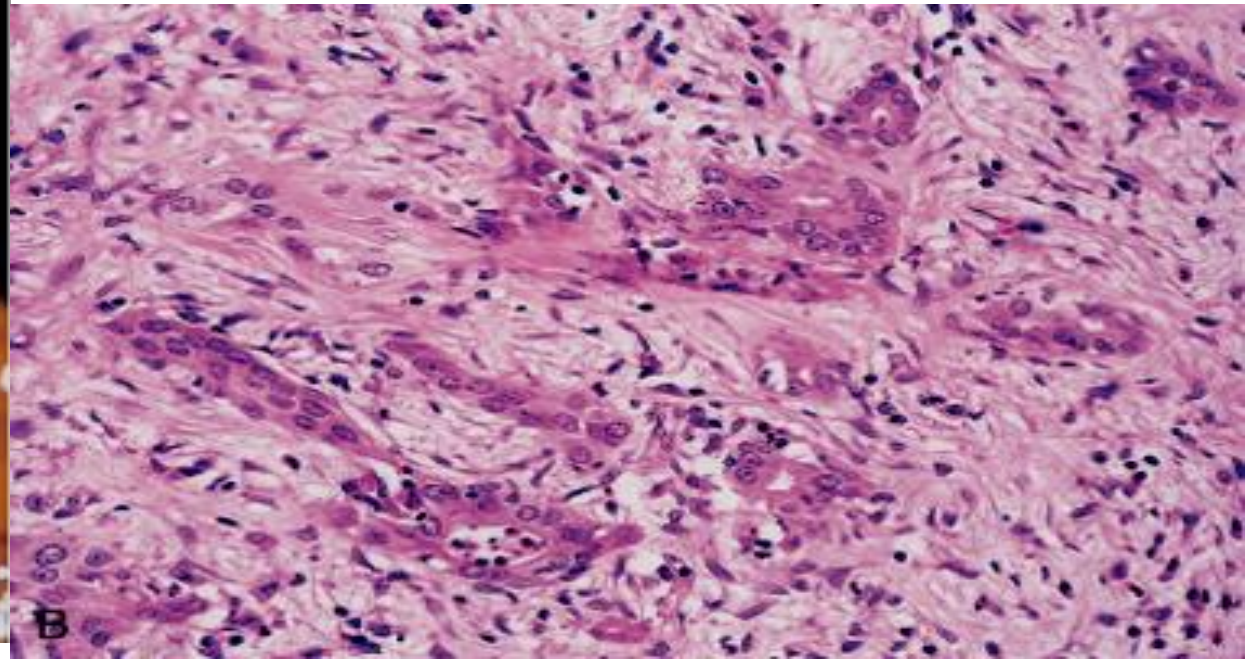
(B) Histologically, the cyst lacks an epithelial lining and instead is lined by fibrin and granulation tissue, with typical changes of chronic inflammation.



Carcinoma of the pancreas

A, A cross-section through the head of the pancreas and adjacent common bile duct showing both an ill-defined mass in the pancreatic substance (arrowheads) and the green discoloration of the duct resulting from total obstruction of bile flow.

B, Poorly formed glands are present in a densely fibrotic (desmoplastic) stroma within the pancreatic substance.



Pancreatic ductal adenocarcinoma.

(A) Gross examination shows tumor in the head of the pancreas.

The consistency is firm and the appearance after cross section is gray–white.

(B) Microscopic examination reveals a moderately differentiated ductal adenocarcinoma with a poorly differentiated component. Infiltrating malignant glands are seen here embedded in a dense fibrotic stroma.

