GNT Block
2020
Pathology Practical

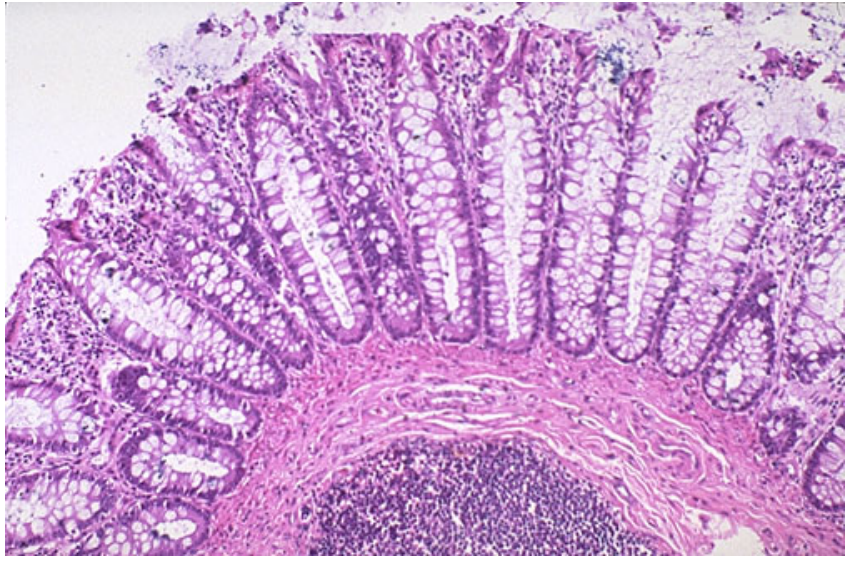
Colon and Hepatobiliary system

Colon

Liver, biliary system and pancreas practical

LARGE INTESTINE

Normal mucosa of large intestine



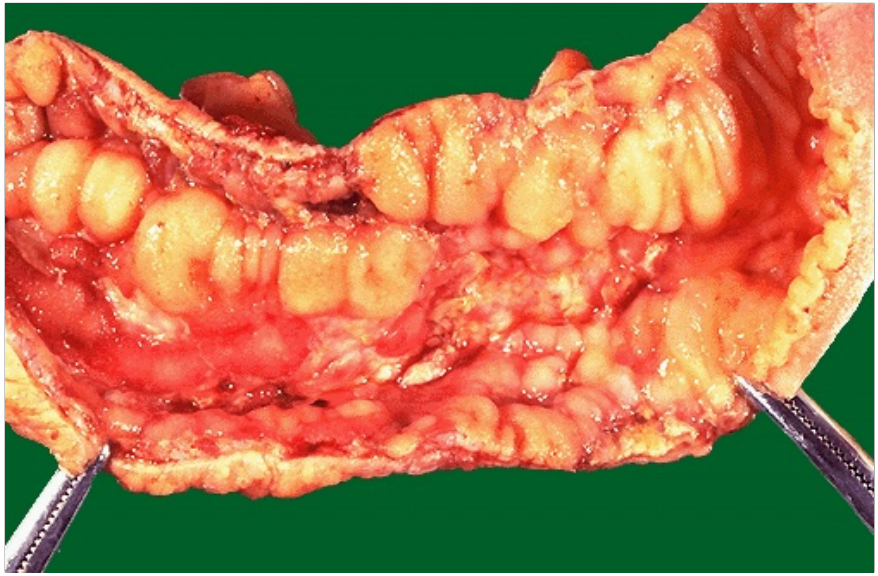
This is normal colonic mucosa. Note the crypts that are lined by numerous goblet cells. In the submucosa is a lymphoid nodule. The gut-associated lymphoid tissue as a unit represents the largest lymphoid organ of the body

Crohn's disease

Crohn's Disease- Gross

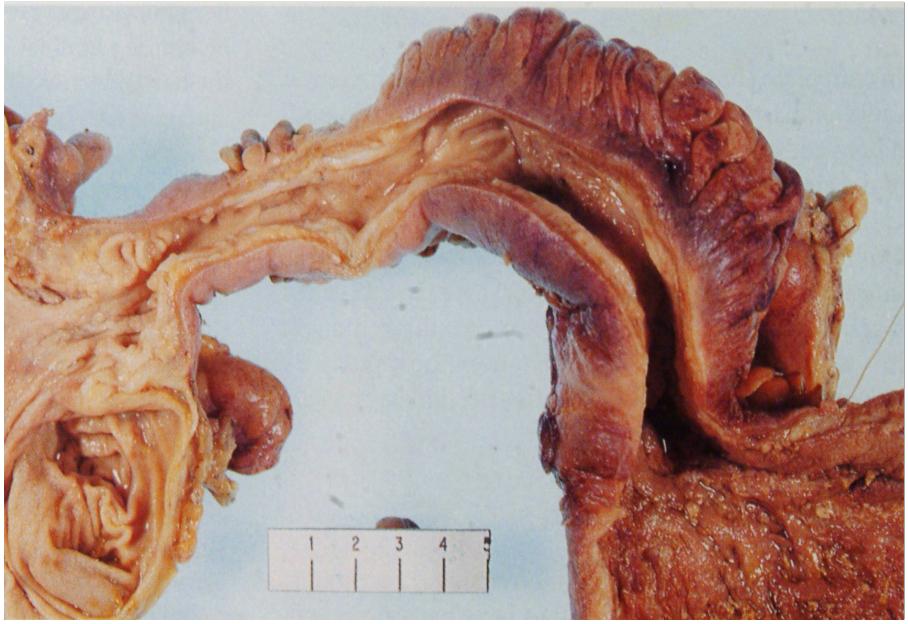
Here the inflammation has produced large, irregularly shaped to rake-like ulcers that are separated from each other by mucosa that appears close to normal.

Crohn's Disease- Gross



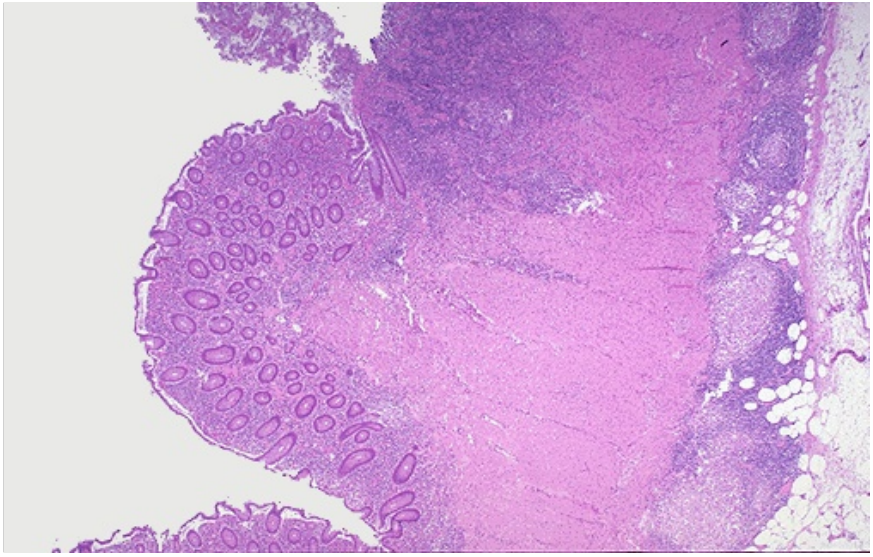
This is another example of Crohn's disease involving the small intestine. Here, the mucosal surface demonstrates an irregular nodular appearance with hyperemia and focal superficial ulceration.

Crohn's Disease vs Normal Colon



Section of large bowel shows alternating normal and ulcerating mucosa

Crohn's Disease- LPF

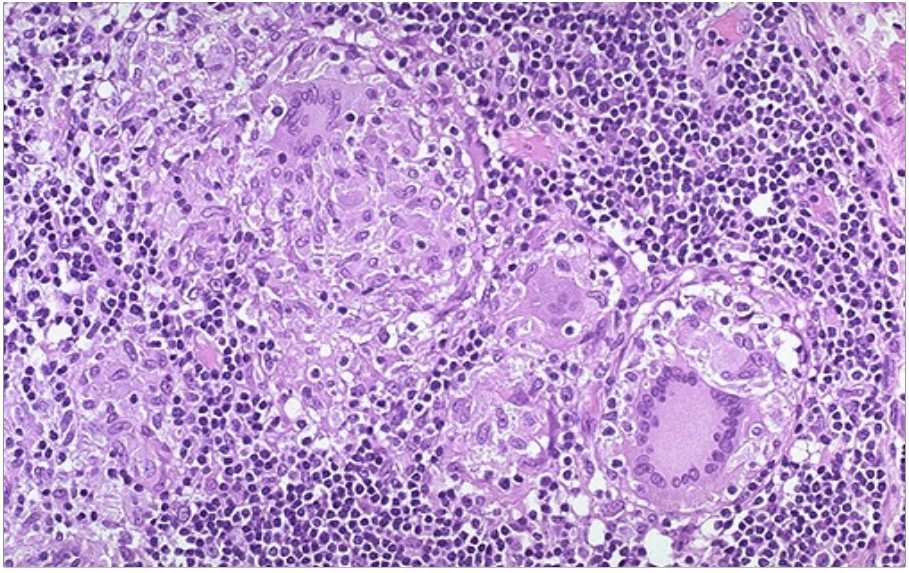


Microscopically, Crohn's disease is characterized by transmural inflammation. Here, inflammatory cells (the bluish infiltrates) extend from mucosa through submucosa and muscularis and appear as nodular infiltrates on the serosal surface with pale granulomatous centers.

Crohn's Disease- HPF

All layers of intestinal wall show transmural chronic inflammatory cell infiltrate, lymphoid aggregates and mild fibrosis. Subserosa contains few epithelioid granulomas

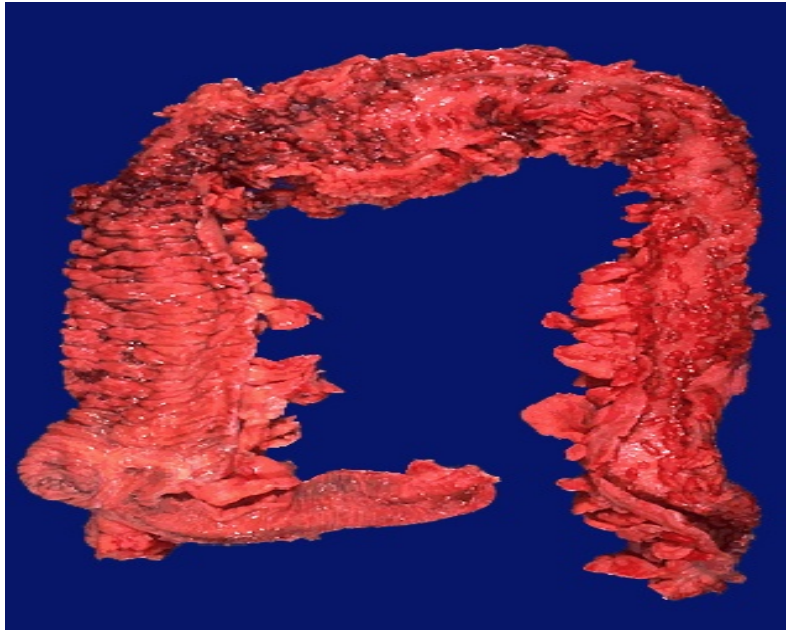
Crohn's Disease- HPF



At high magnification the granulomatous nature of the inflammation of Crohn's disease is demonstrated here with epithelioid cells, giant cells, and many lymphocytes. Special stains for organisms are negative.

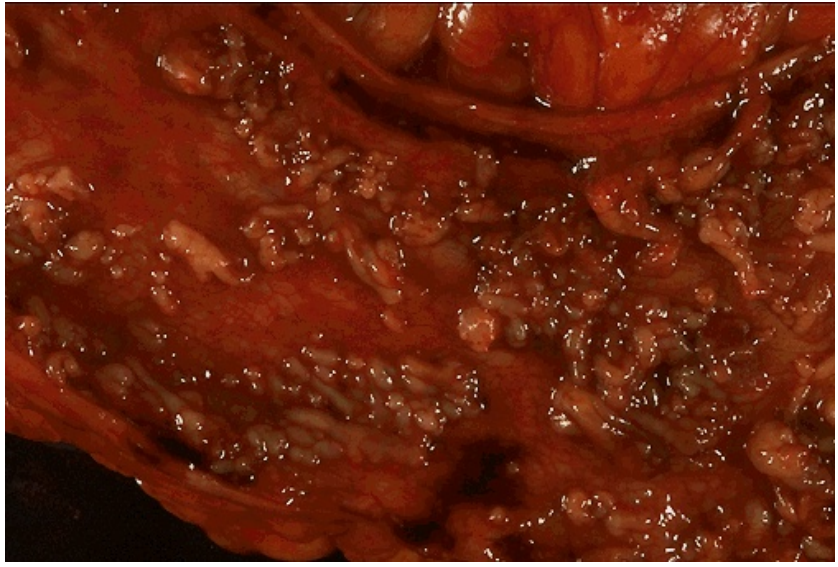
Ulcerative colitis

Chronic Ulcerative Colitis - Gross



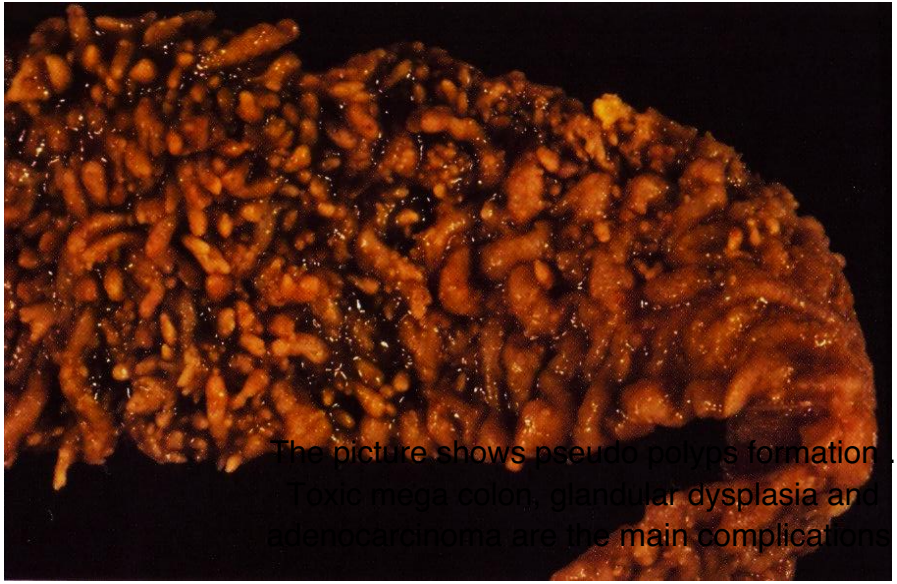
The most intense inflammation begins at the sigmoid colon (Right) and extends upward and around to the ascending colon. At the lower left is the ileocecal valve with a portion of terminal ileum that is not involved.

Pseudopolyps - Gross



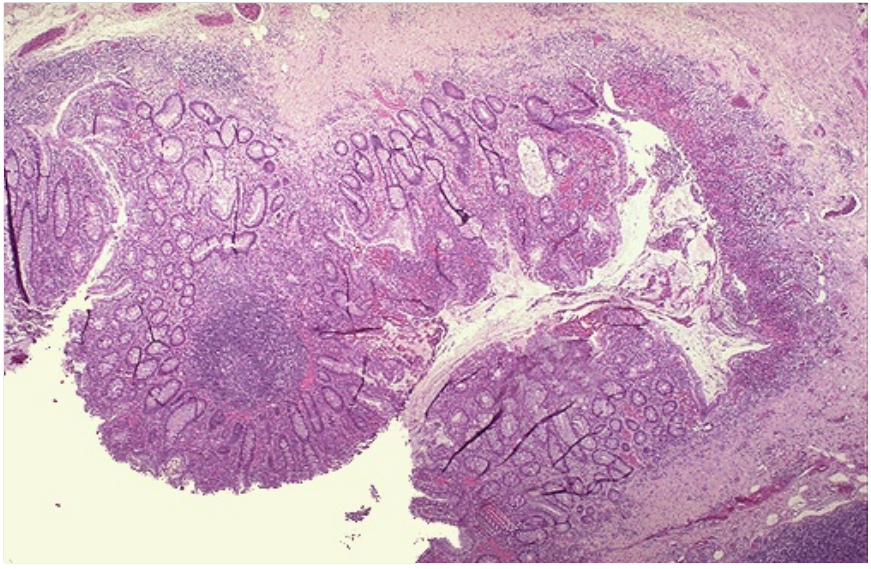
Pseudopolyps are seen here in a case of severe ulcerative colitis. The remaining mucosa has been ulcerated away and is hyperemic.

Pseudopolyps - Gross



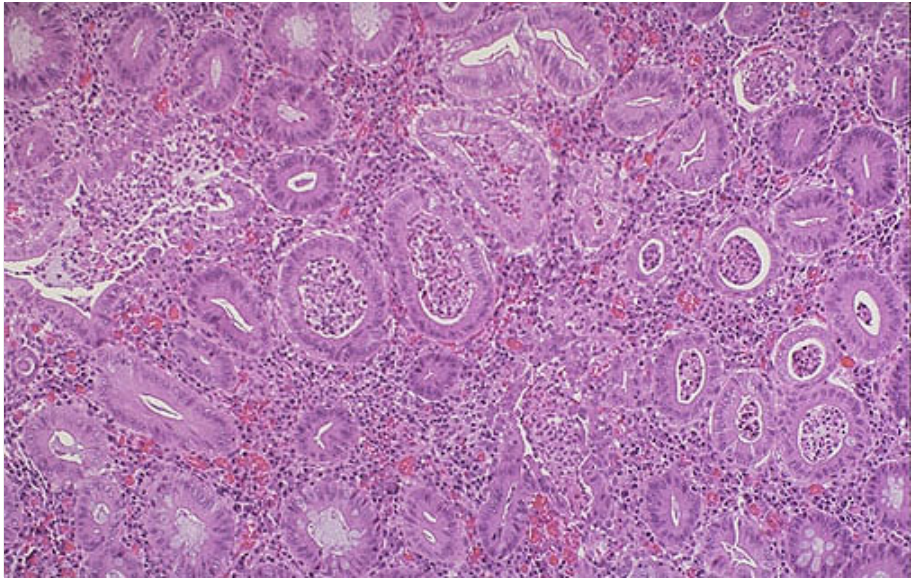
The picture shows pseudo polyps formation .
Toxic mega colon, glandular dysplasia and adenocarcinoma are the main complications .

Chronic Ulcerative Colitis - LPF



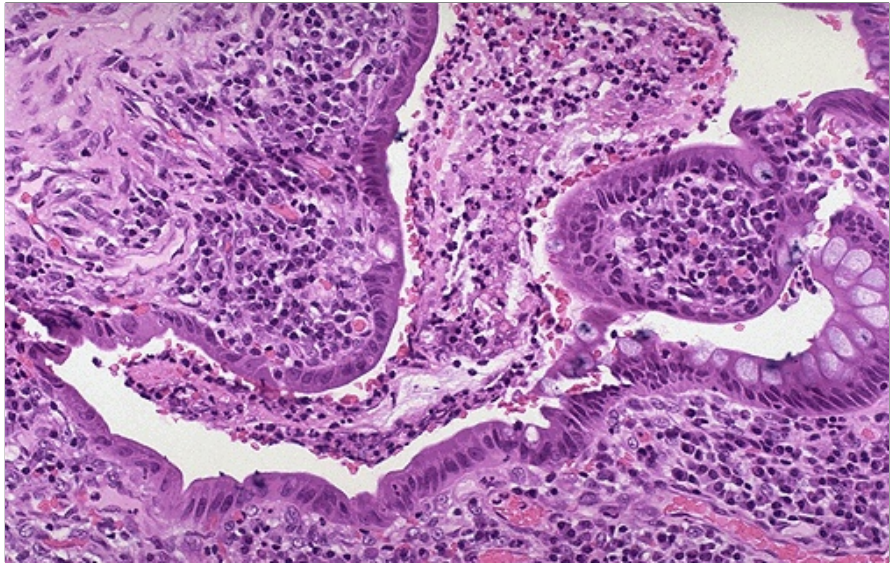
Microscopically, the inflammation of ulcerative colitis is confined primarily to the mucosa. Here, the mucosa is eroded by an ulcer that undermines surrounding mucosa.

Ulcerative Colitis with Crypt Abscesses - MPF



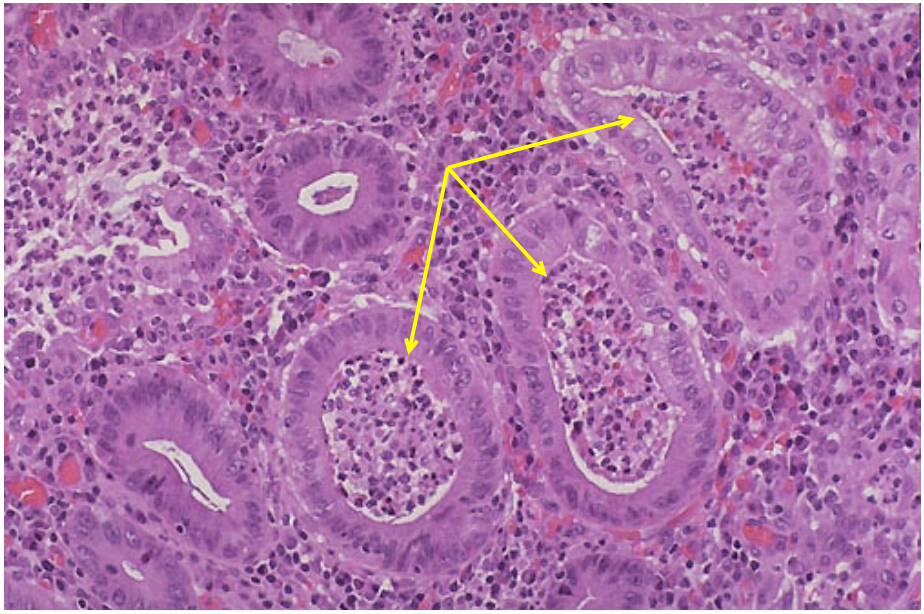
The colonic mucosa of active ulcerative colitis shows "crypt abscesses" in which a neutrophilic exudate is found in glandular lumens. The submucosa shows intense inflammation. The glands demonstrate loss of goblet cells and hyperchromatic nuclei with inflammatory atypia.

Chronic Ulcerative Colitis - HPF



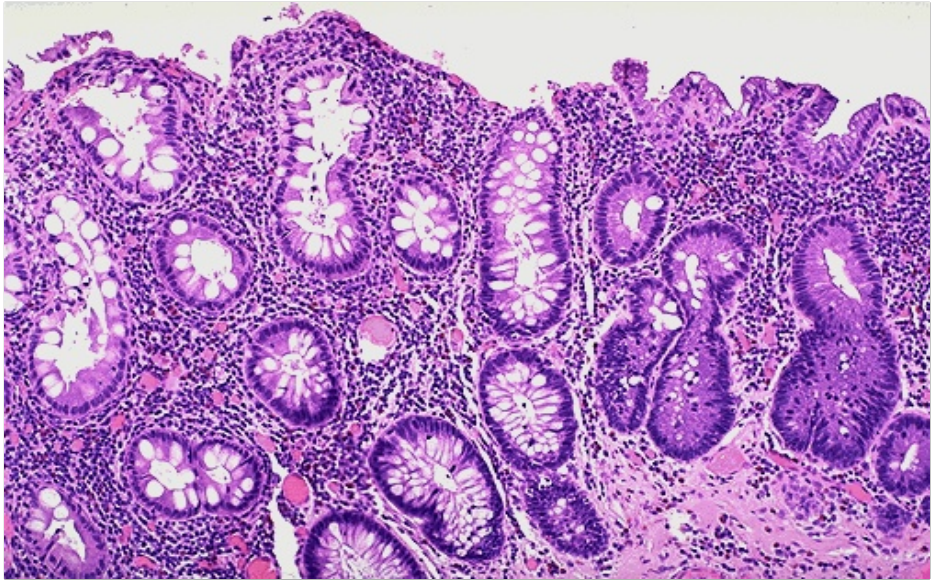
At higher magnification, the intense inflammation of the mucosa is seen. The colonic mucosal epithelium demonstrates loss of goblet cells. An exudate is present over the surface. Both acute and chronic inflammatory cells are present

Ulcerative Colitis with Crypt Abscesses - HPF



Crypt abscesses are a histologic finding more typical with ulcerative colitis. Unfortunately, not all cases of inflammatory bowel disease can be classified completely in all patients

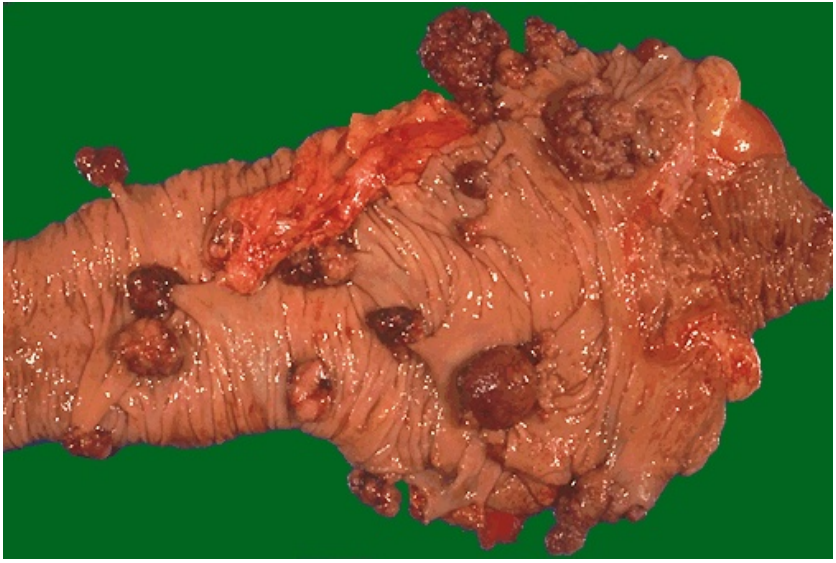
Chronic Ulcerative Colitis with Dysplasia- MPF



Over time, there is a risk for adenocarcinoma with ulcerative colitis. Here, more normal glands are seen at the left, but the glands at the right demonstrate dysplasia, the first indication that there is a move towards neoplasia.

Adenomatous polyps of rectum / colon

Adenomatous polyp of the colon - Gross

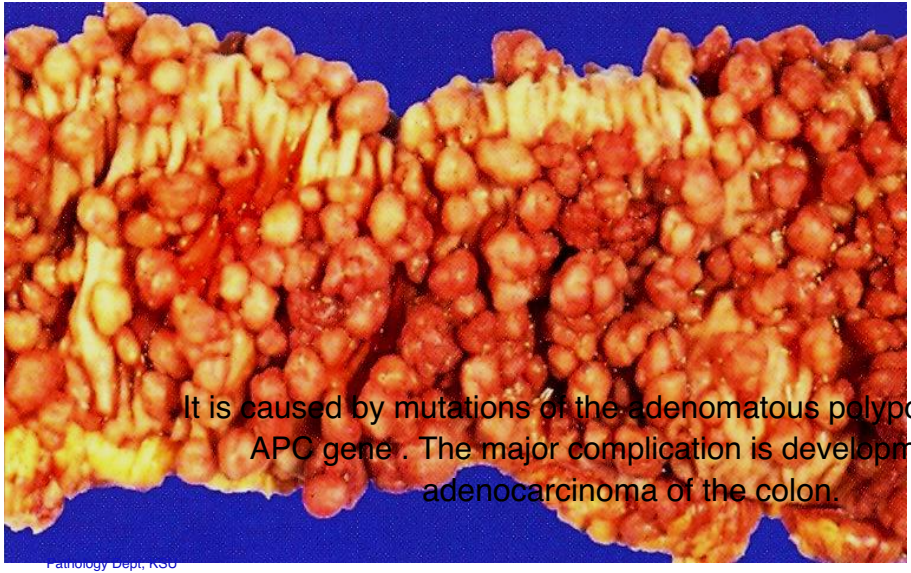


Multiple adenomatous polyps (tubulovillous adenomas) of the cecum are seen here in a case of familial adenomatous polyposis, a genetic syndrome in which an abnormal genetic mutation leads to development of multiple neoplasms in the colon

Adenomatous polyp of the colon - Gross

This adenomatous polyp has a hemorrhagic surface (which is why they may first be detected with stool occult blood screening) and a long narrow stalk. The size of this polyp--above 2 cm--makes the possibility of malignancy more likely, but this polyp proved to be benign

Familial polyposis of the colon - Gross

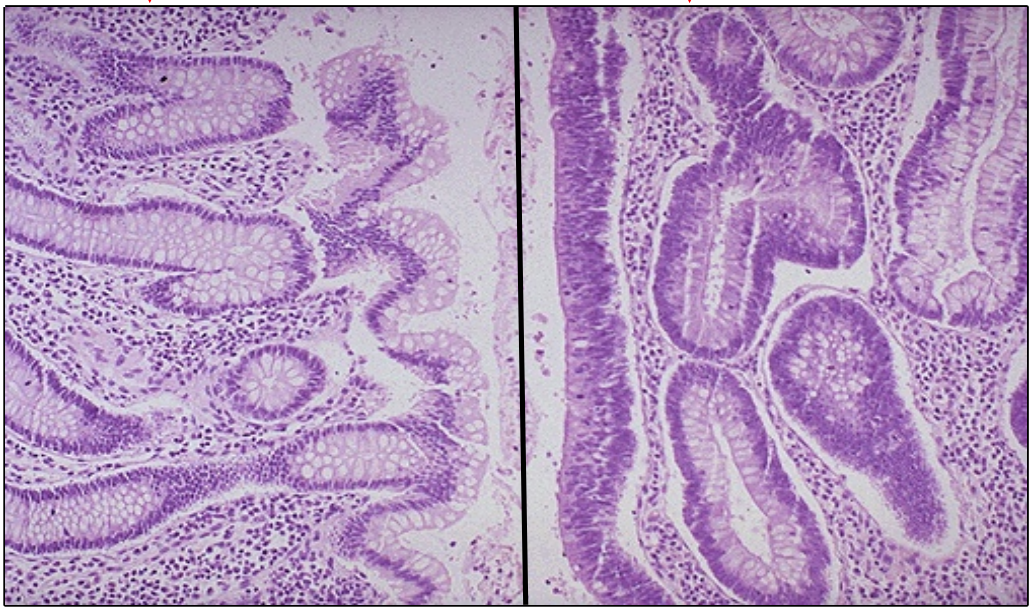


It is caused by mutations of the adenomatous polyposis coli , or APC gene . The major complication is development of adenocarcinoma of the colon.

Adenomatous polyp of the colon - LPF

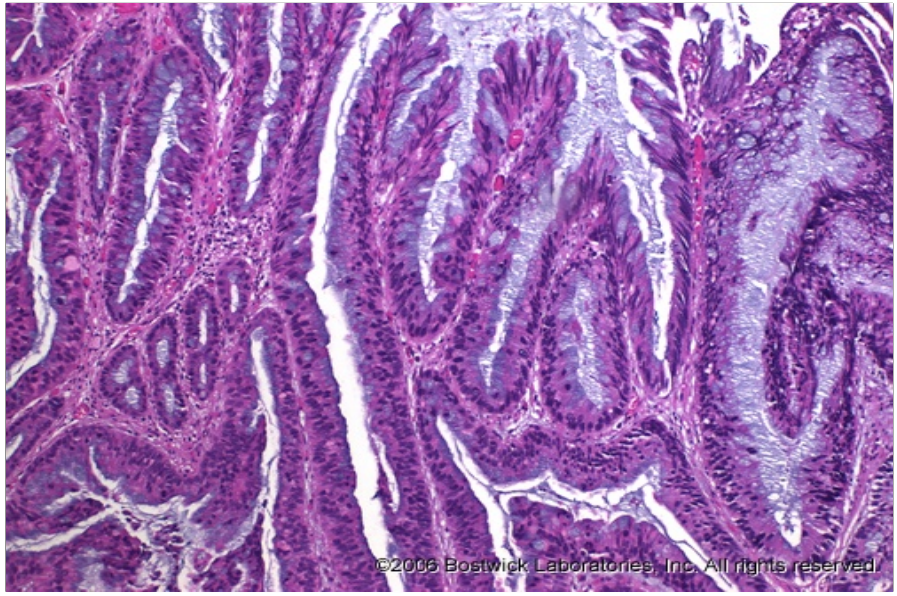
This small adenomatous polyp (tubular adenoma) on a small stalk is seen microscopically to have more crowded, disorganized glands than the normal underlying colonic mucosa. Goblet cells are less numerous and the cells lining the glands of the polyp have hyperchromatic nuclei

Normal vs Adenomatous polyp of the colon - MPF



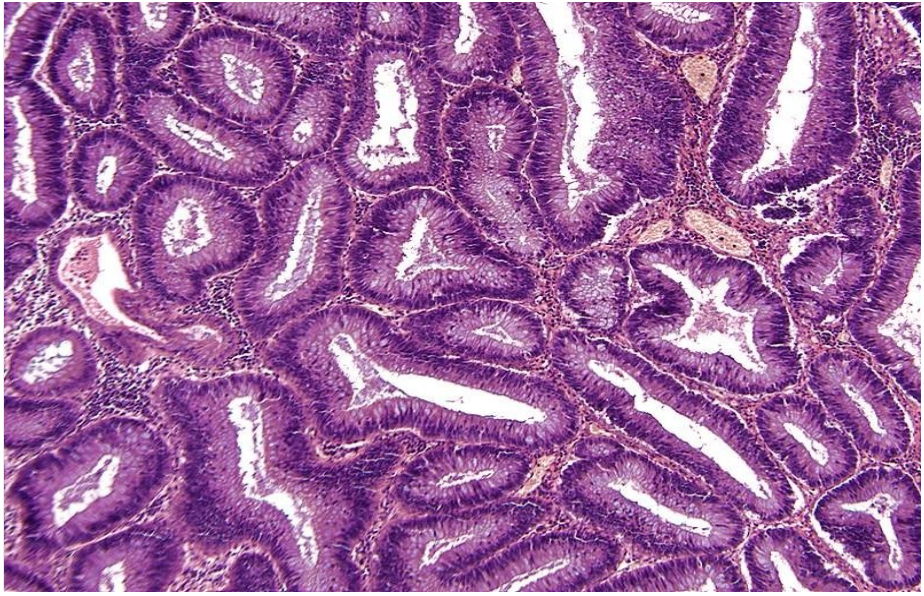
A microscopic comparison of normal colonic mucosa on the left and that of an adenomatous polyp (tubular adenoma) on the right is seen here. The neoplastic glands are more irregular with darker (hyperchromatic) and more crowded nuclei

Adenomatous Polyp (Villous) - MPF



Villous adenomas behave more aggressively than tubular adenomas. They have a HIGHER rate of developing into frank adenocarcinomas than the “tubular” patterns.

Adenomatous Polyp (Tubular) - MPF



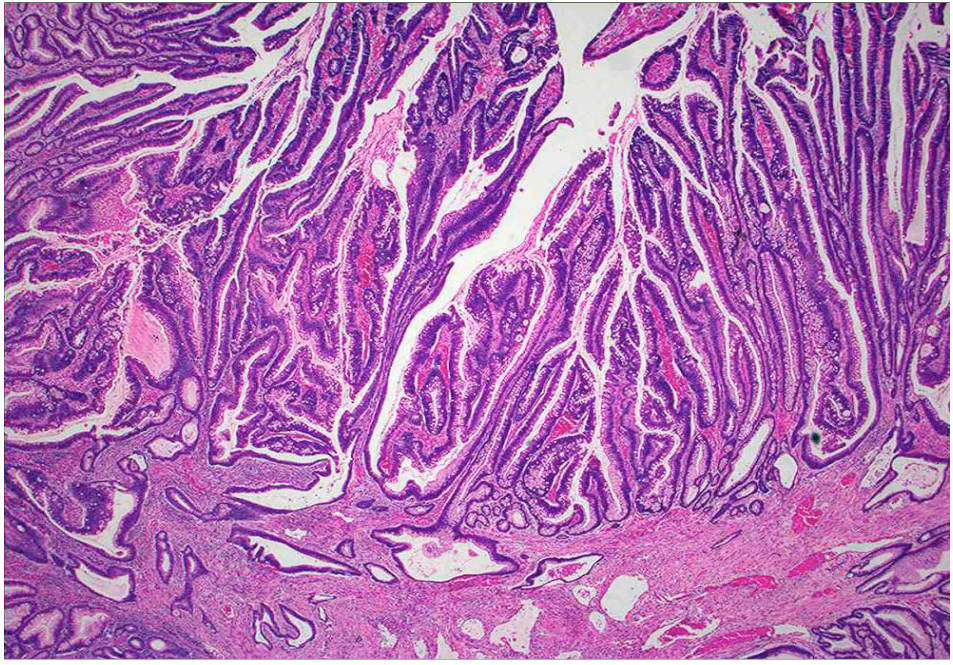
TUBULAR adenoma with crowded dysplastic glands and chronic inflammation.

Adenocarcinoma of the large intestine

Adenocarcinoma of the Colon - Gross

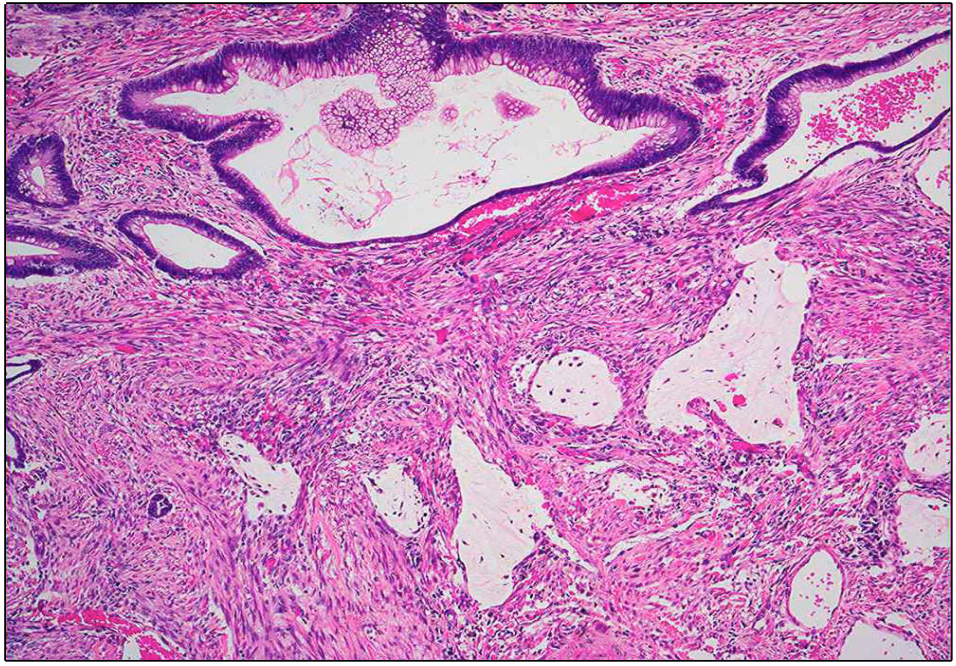
This is an adenocarcinoma arising in a villous adenoma. The surface of the neoplasm is polypoid and reddish pink. Hemorrhage from the surface of the tumor creates a guaiac positive stool. This neoplasm was located in the sigmoid colon

Adenocarcinoma of the Colon - LPF



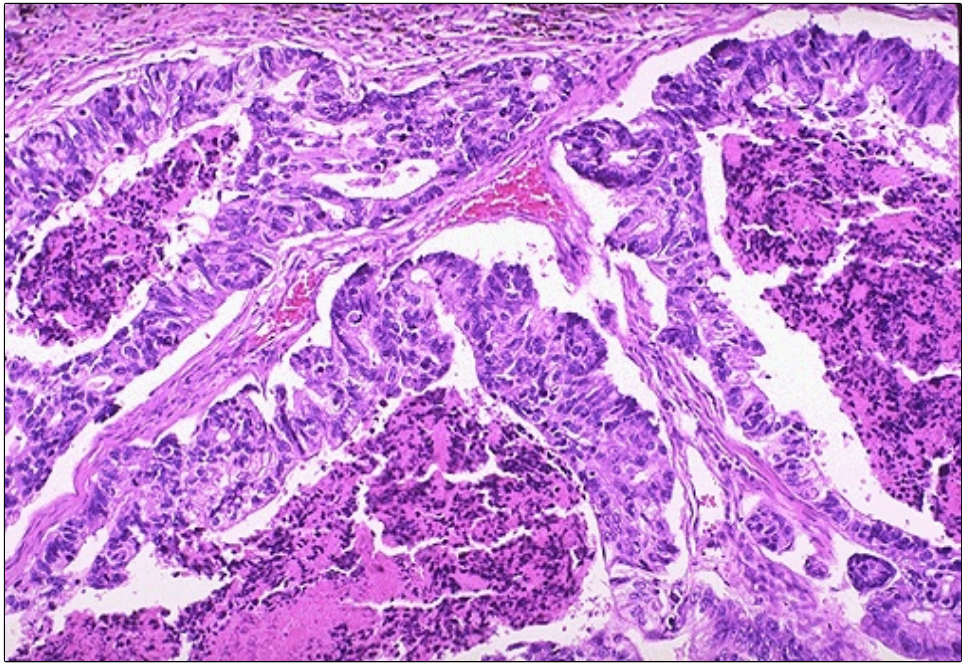
Tumour consists of crowded irregular malignant acini separated by thin fibrovascular stroma.

Adenocarcinoma of the Colon - LPF



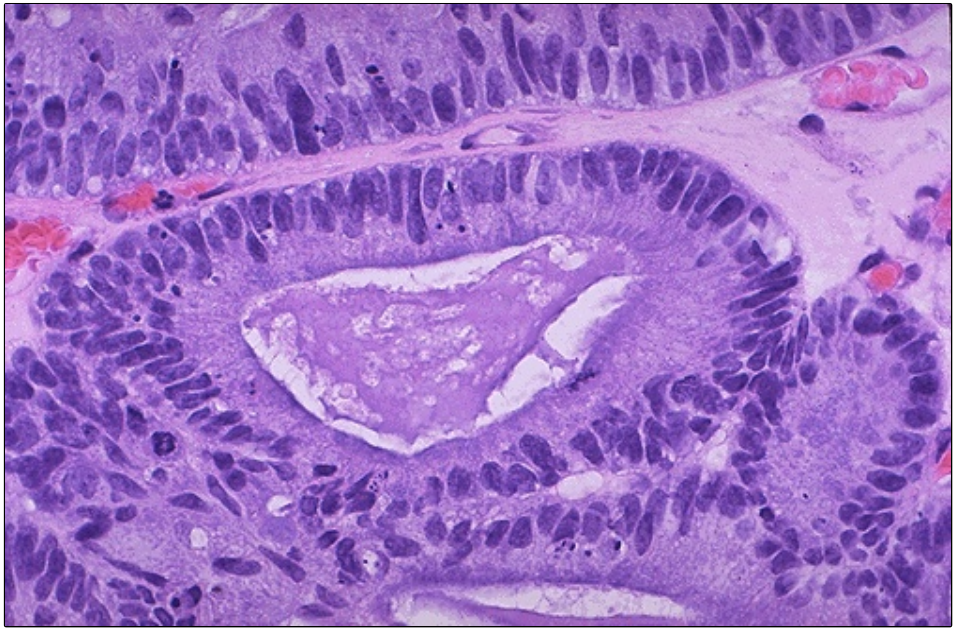
The acini are lined by one or several layers of neoplastic cells with papillary projection showing pleomorphism, hyperchromatism and few mitoses.

Adenocarcinoma of the Colon - MPF



Here is an adenocarcinoma in which the glands are much larger and filled with necrotic debris.

Adenocarcinoma of the Colon - HPF



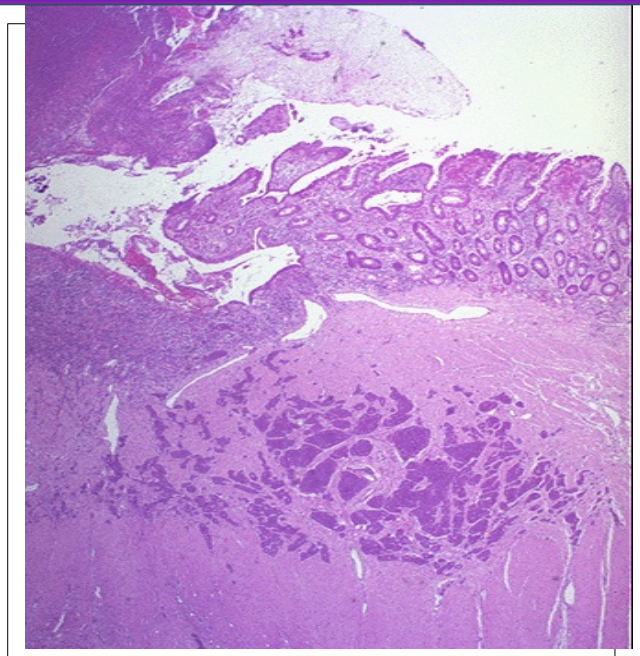
At high magnification, the neoplastic glands of adenocarcinoma have crowded nuclei with hyperchromatism and pleomorphism. No normal goblet cells are seen

Carcinoid tumor of Small Intestine

Carcinoid tumor of small intestine - Gross

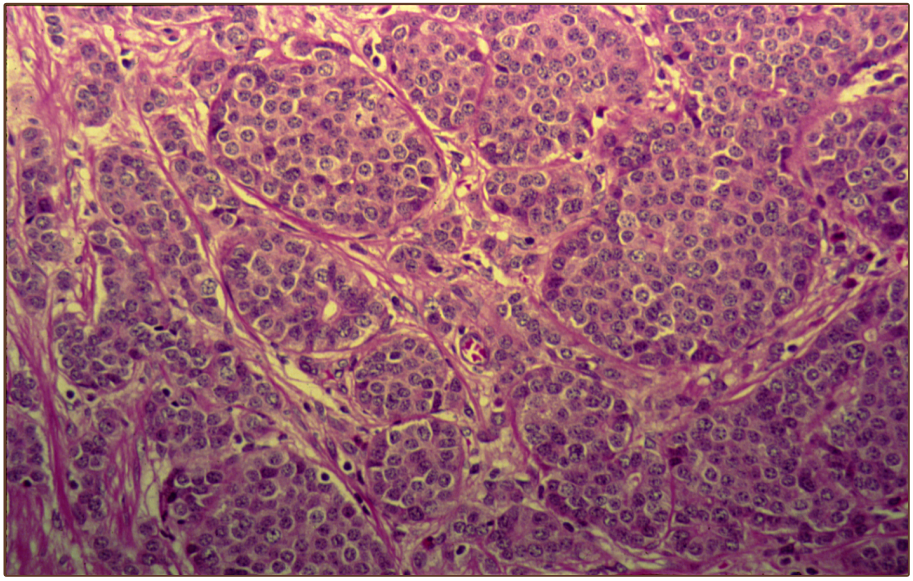
Neoplasms of the small intestine are uncommon. Benign tumors can include leiomyomas, fibromas, neurofibromas, and lipomas. Seen here at the ileocecal valve is another tumor that has a faint yellowish color. This is a carcinoid tumor. Most benign tumors are incidental submucosal lesions, though rarely they can be large enough to obstruct the lumen.

Carcinoid tumor of small intestine - LPF



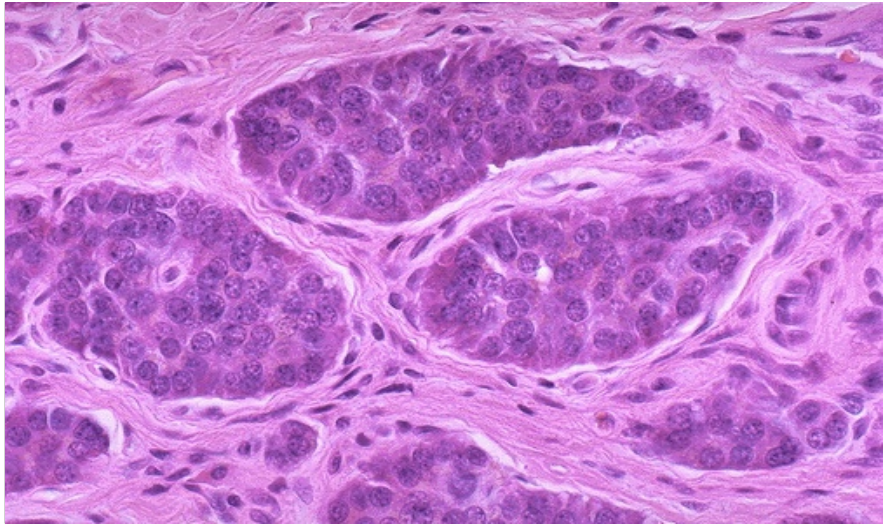
The carcinoid tumor is seen here to be a discreet, though not encapsulated, mass of multiple nests of small blue cells in the submucosa.

Carcinoid tumor of small intestine - MPF



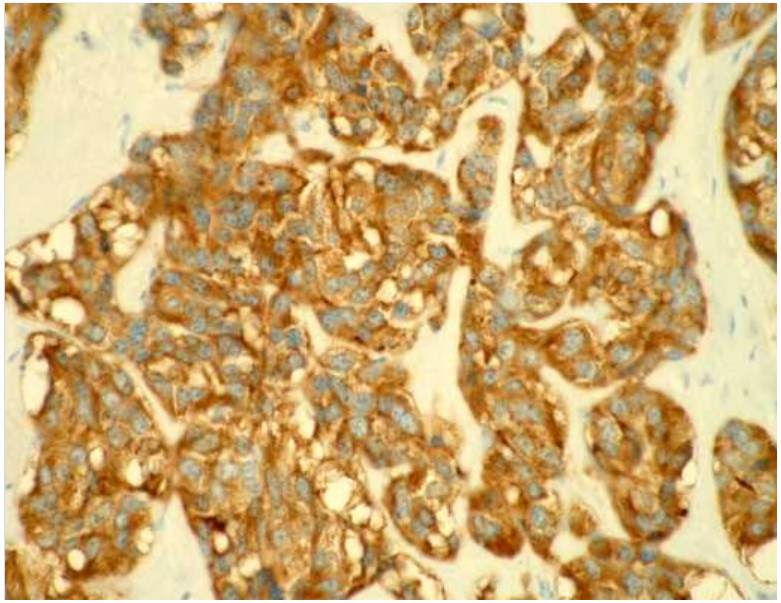
Tumour consists of alveolar groups and clumps of small uniform polygonal cells having centrally placed round nuclei and abundant granular cytoplasm.

Carcinoid tumor of small intestine - HPF



At high magnification, the nests of carcinoid tumor have a typical endocrine appearance with small round cells having small round nuclei and pink to pale blue cytoplasm. Rarely, a malignant carcinoid tumor can occur as a large bulky mass. Metastatic carcinoid to the liver can rarely result in the carcinoid syndrome.

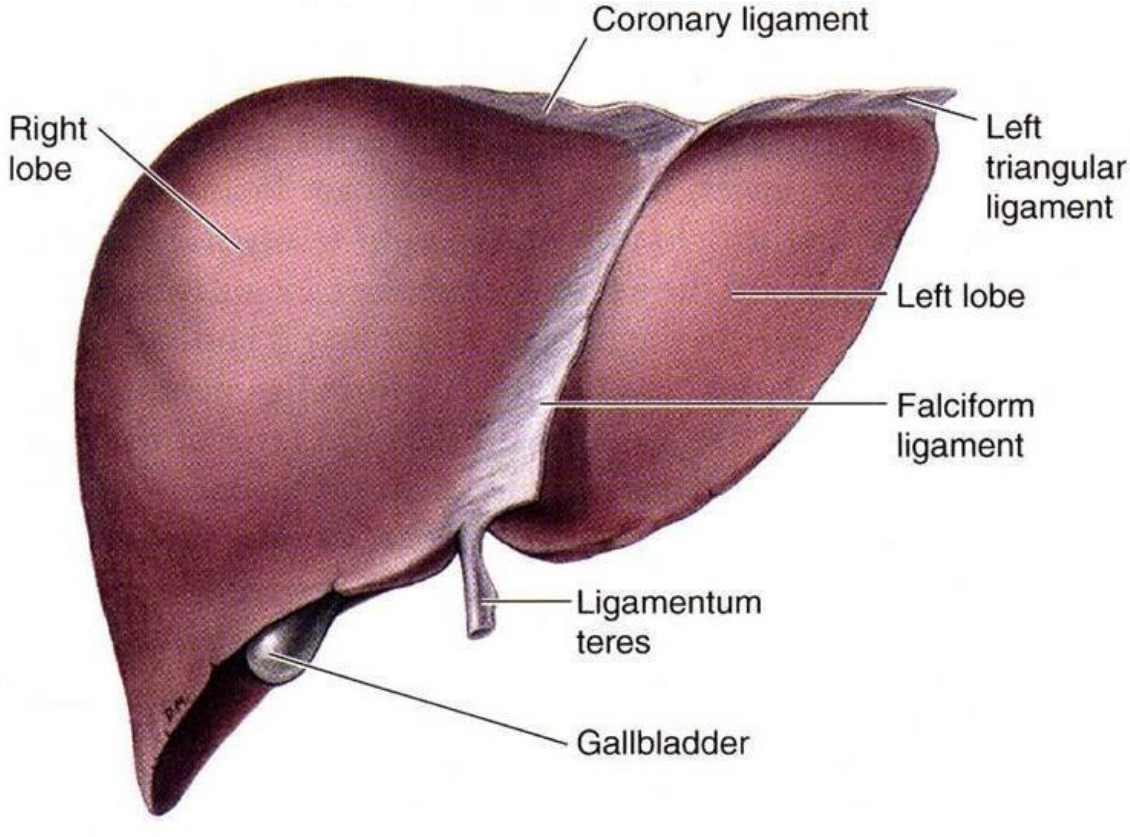
Carcinoid tumor of small intestine – IHC stain

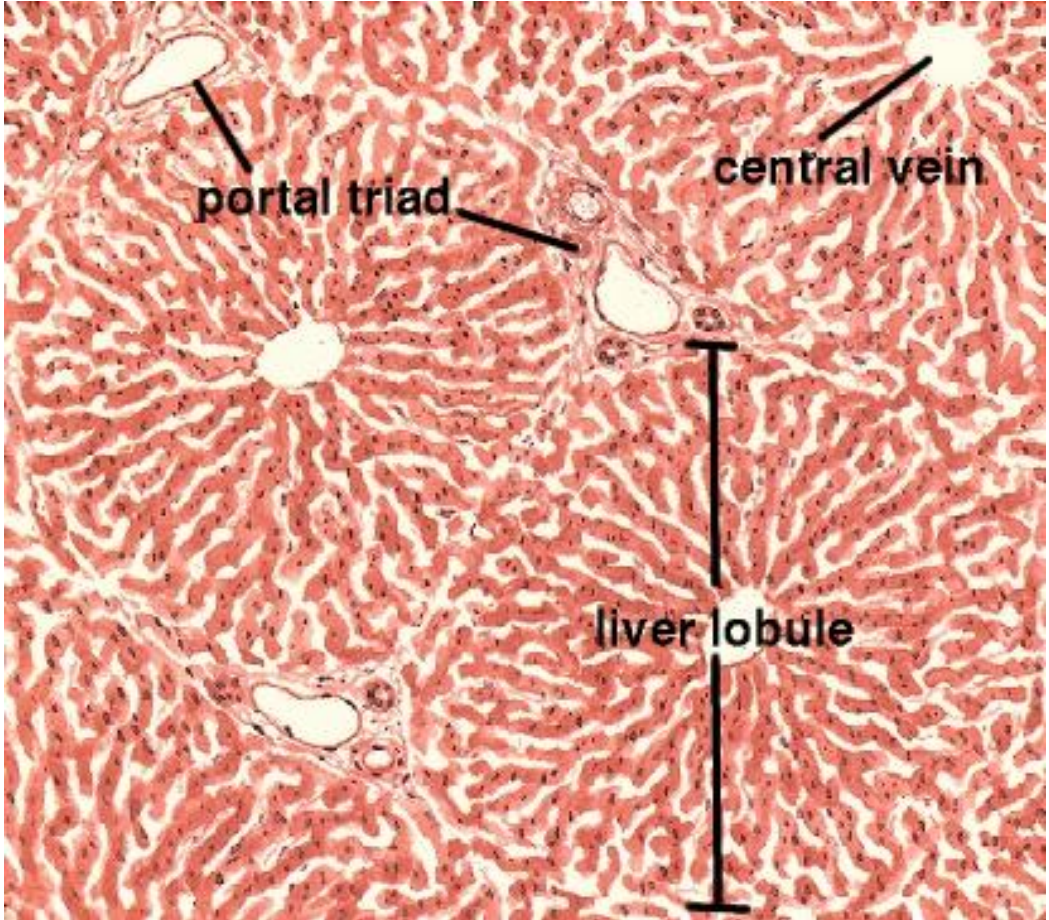


Carcinoid tumor showing strong positive staining with the synaptophysin immunohistochemical stain (IHC stain). This finding confirms the neuroendocrine nature of this neoplasm.

Liver

Normal anatomy and histology


Coronary ligament
Right lobe
Left triangular ligament
Left lobe
Falciform ligament
Ligamentum teres
Gallbladder



N

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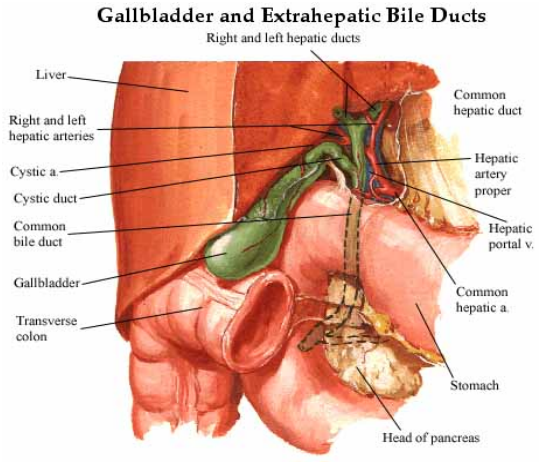
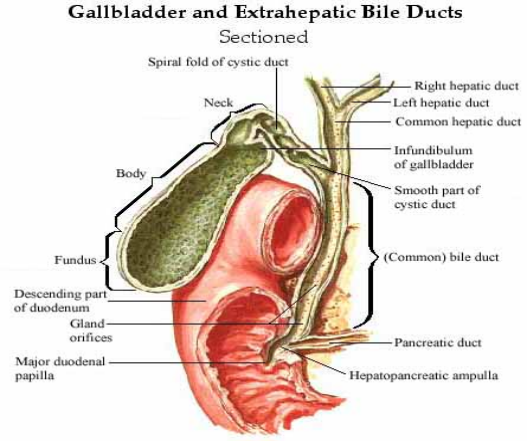
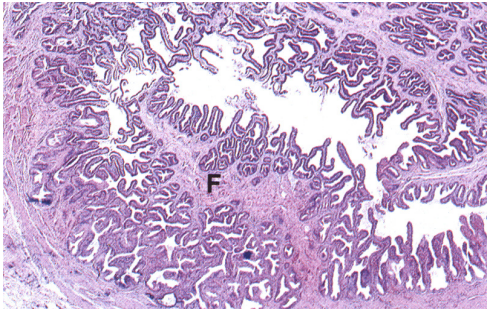
FIBROUS

TISSUE


Gallbladder and Extrahepatic Bile Ducts
Right and left hepatic ducts
Liver
Right and left hepatic arteries
Cystic a.
Cystic duct
Common bile duct
Gallbladder
Transverse colon
Common hepatic duct
Hepatic artery proper
Hepatic portal v.
Common hepatic a.
Stomach
Head of pancreas


Gallbladder and Extrahepatic Bile Ducts
Sectioned
Spiral fold of cystic duct
Neck
Body
Fundus
Descending part of duodenum
Gland orifices
Major duodenal papilla
Right hepatic duct
Left hepatic duct
Common hepatic duct
Infundibulum of gallbladder
Smooth part of cystic duct
(Common) bile duct
Pancreatic duct
Hepatopancreatic ampulla


L
F


lumen
lumen
muscularis
adventitia (serosa)

Liver

Gross and histopathology

Fatty liver

Cholestasis

Drug toxicity

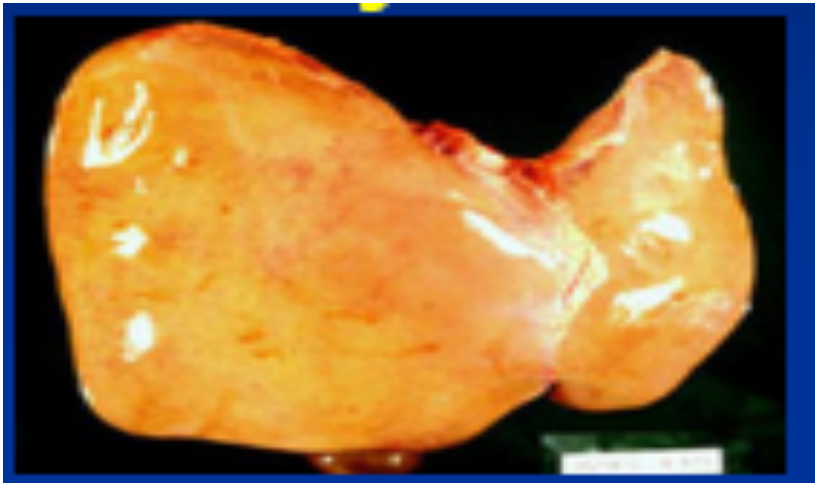
Acute Viral Hepatitis

Chronic hepatitis

Hepatic cirrhosis

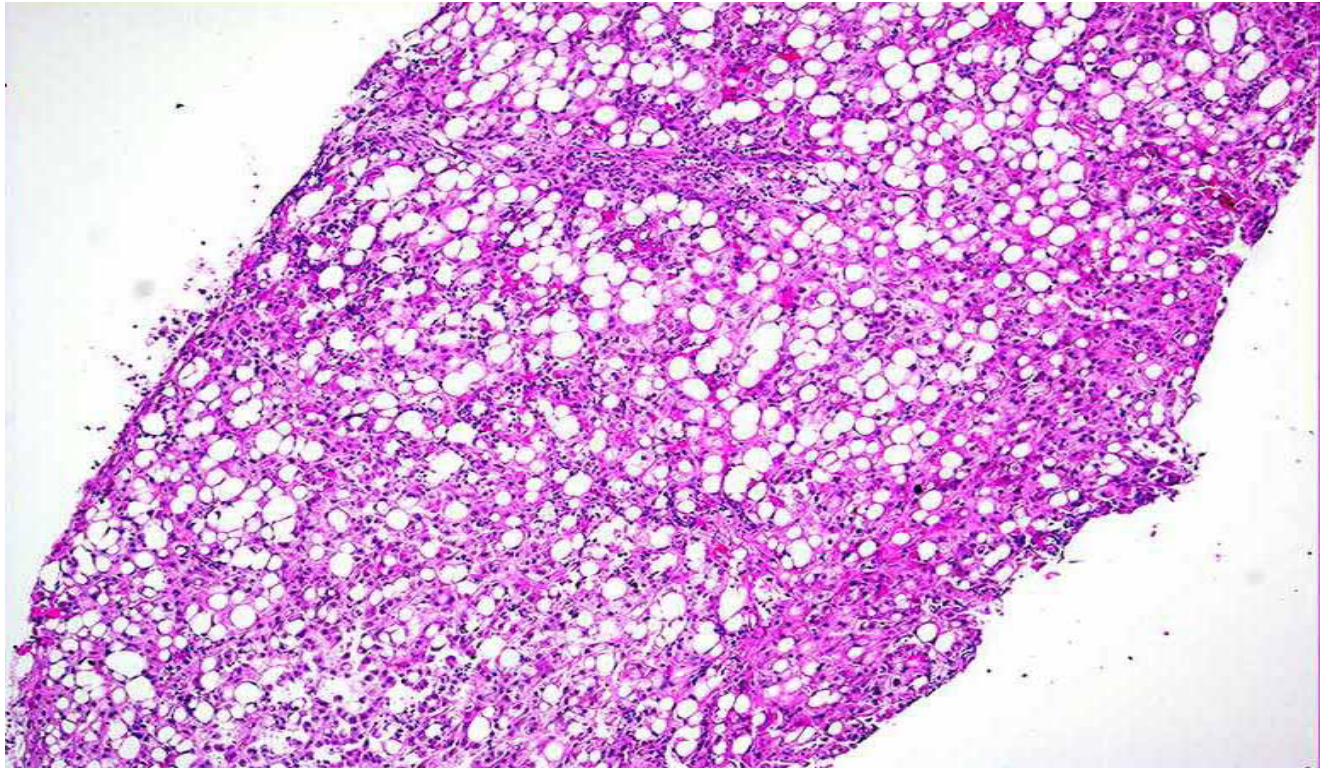
Hepatocellular carcinoma

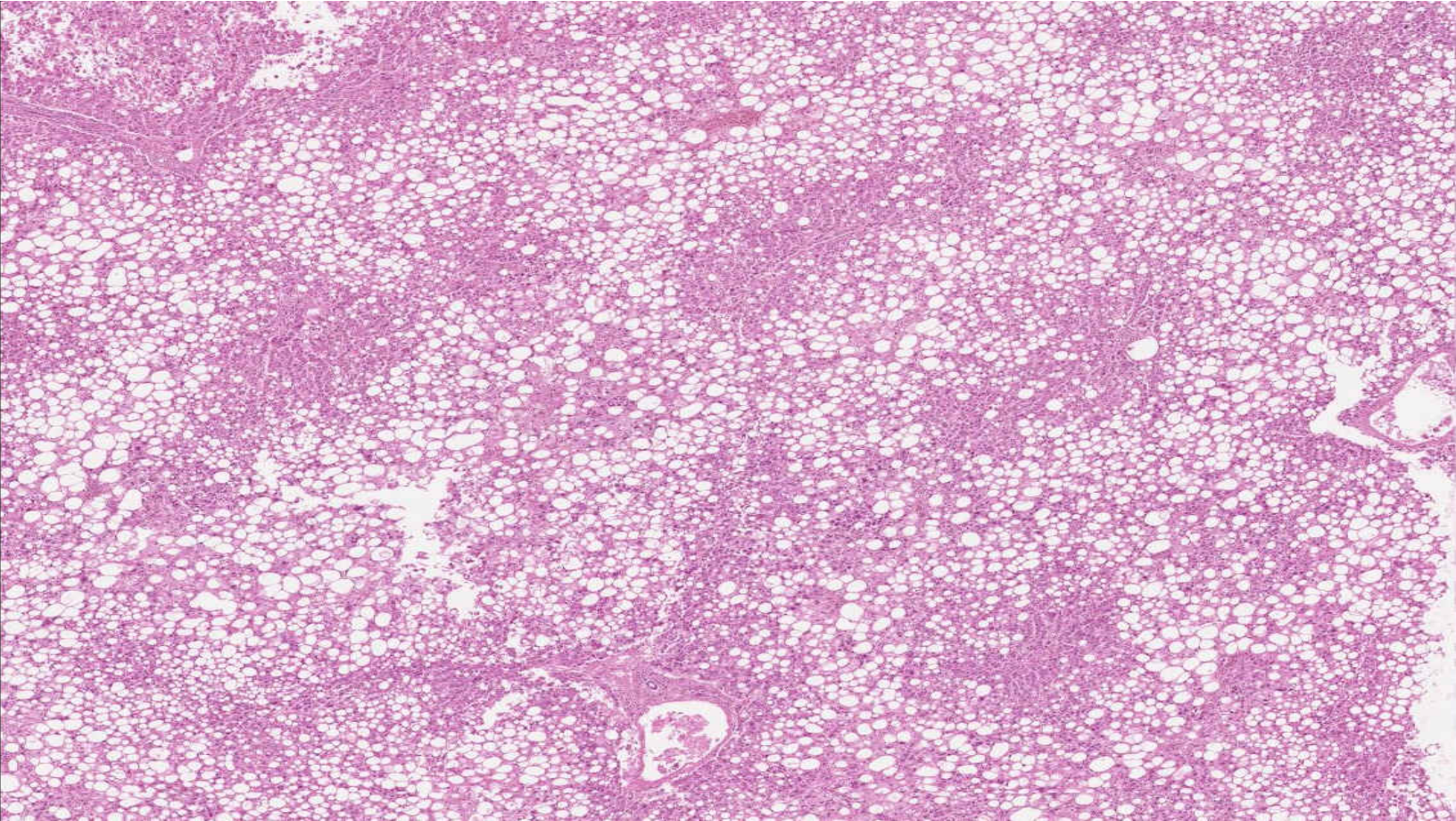
Fatty liver

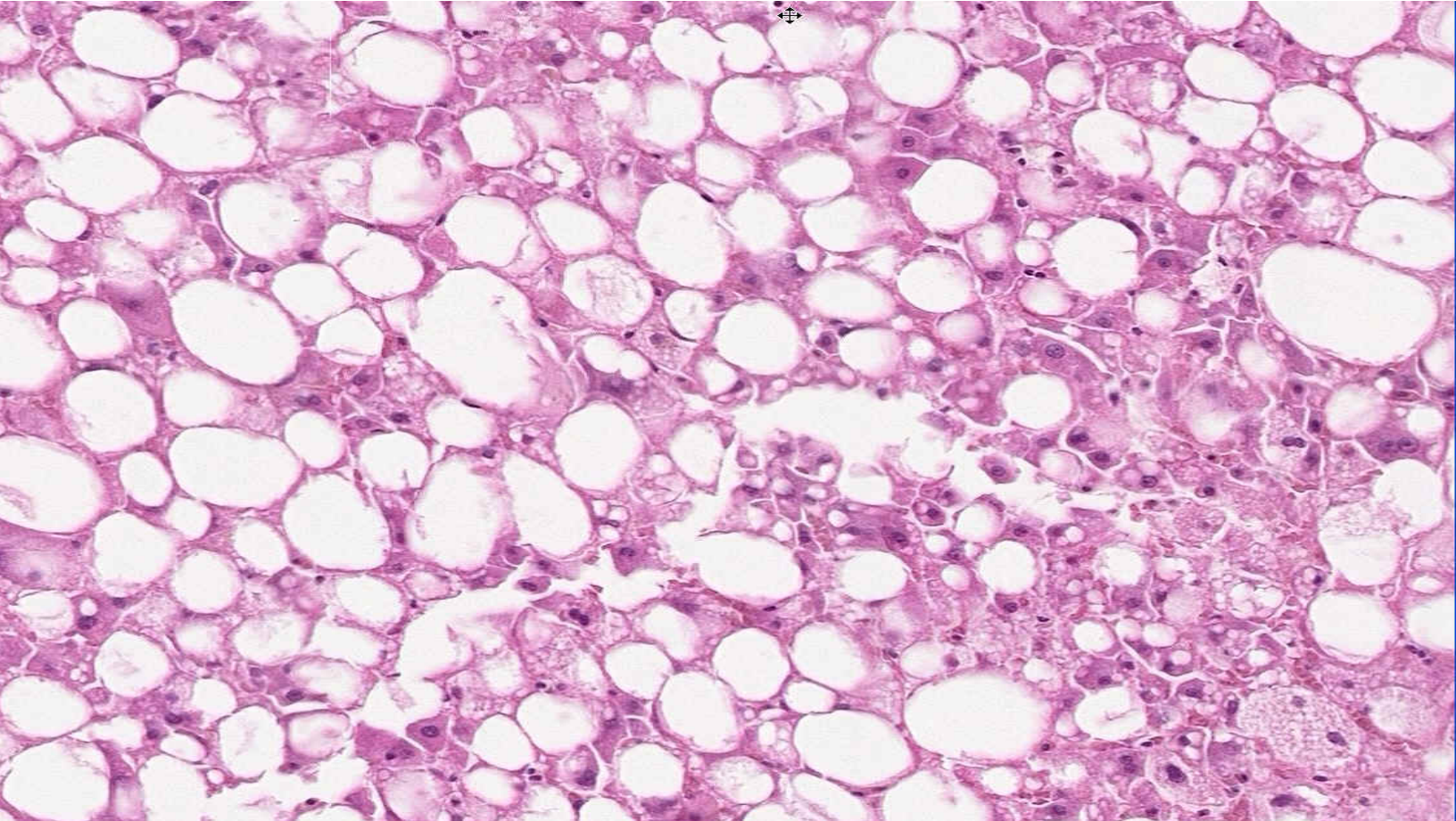


Organ: Liver

Dx: Steatosis (Fatty Liver)







Fatty change of the liver:

Section of liver shows:

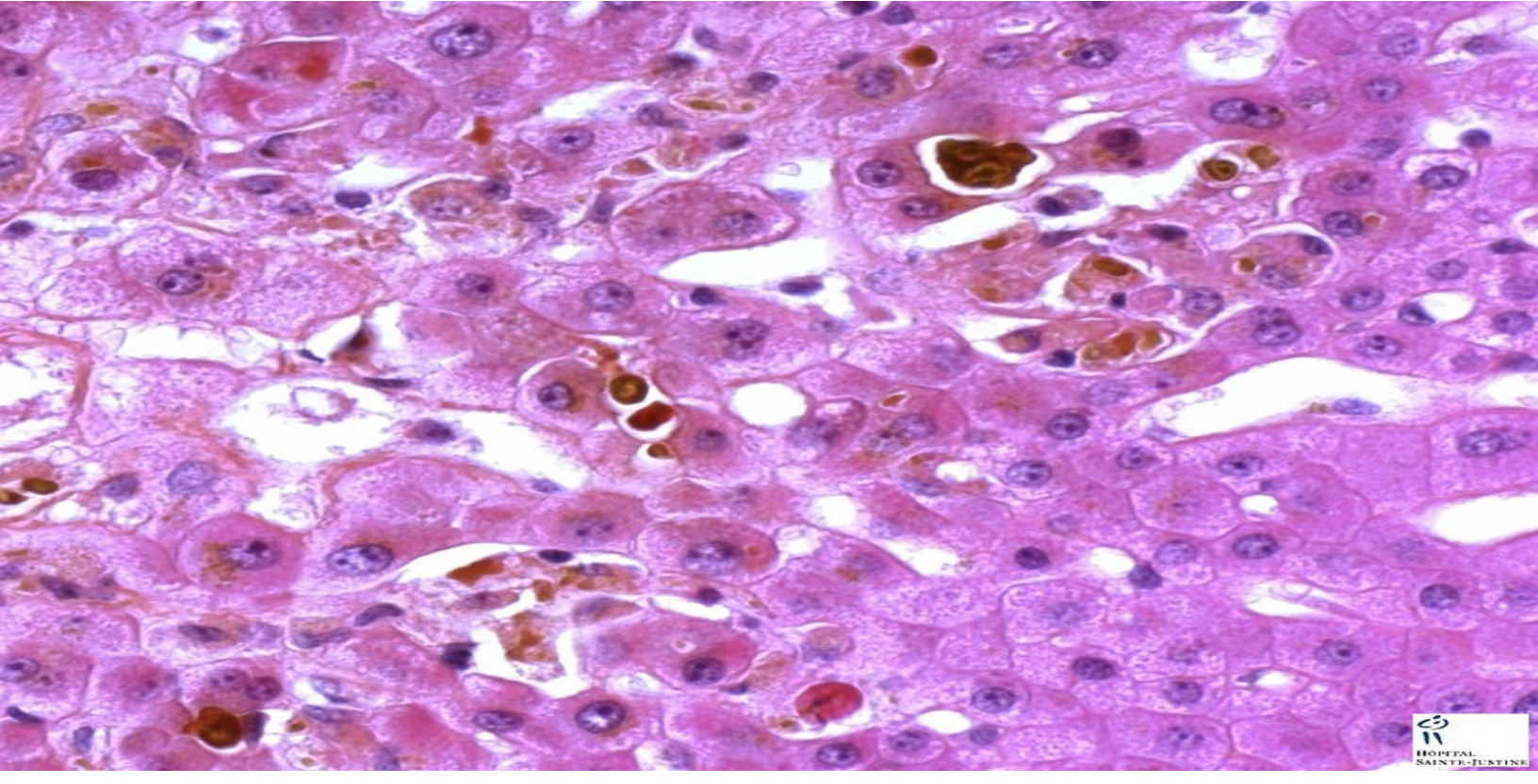
Normal lobular architecture.

The liver cells are distended by clear vacuoles of dissolved fat with displacement of the nuclei to the periphery.

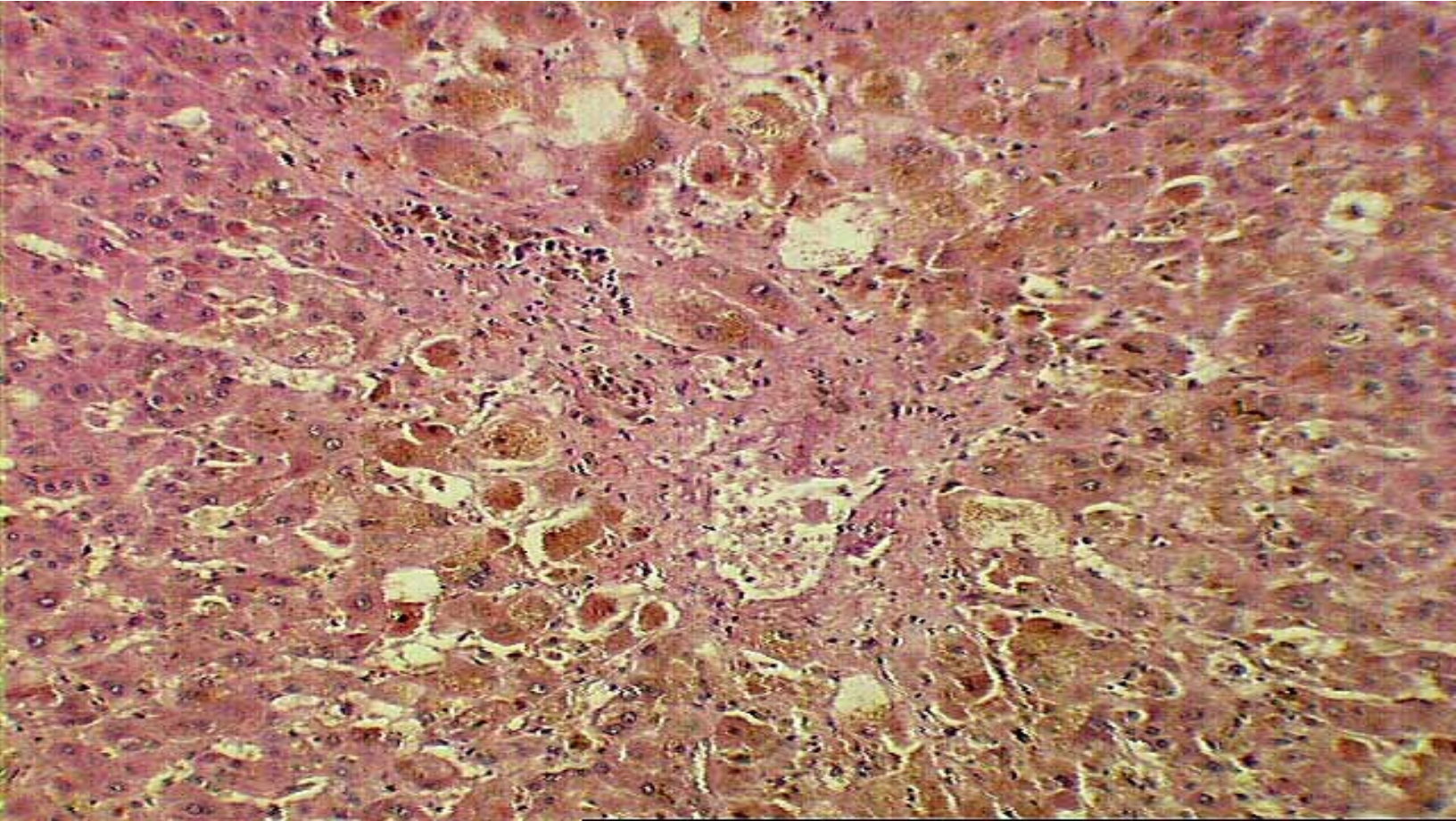
Fatty cysts may be seen.

No inflammation and no fibrosis.

Cholestasis



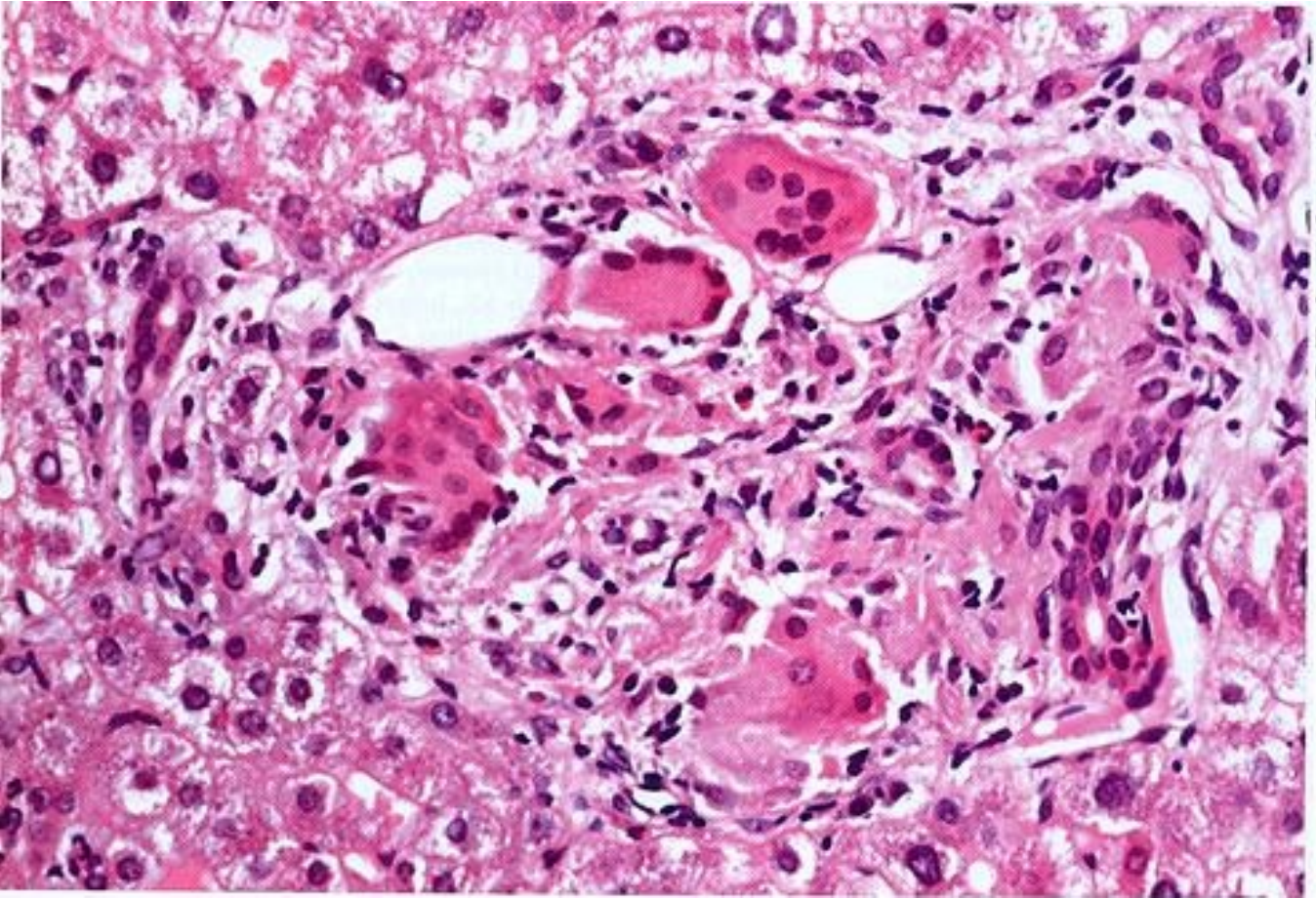
Bile “plugs”, Bile “lakes”



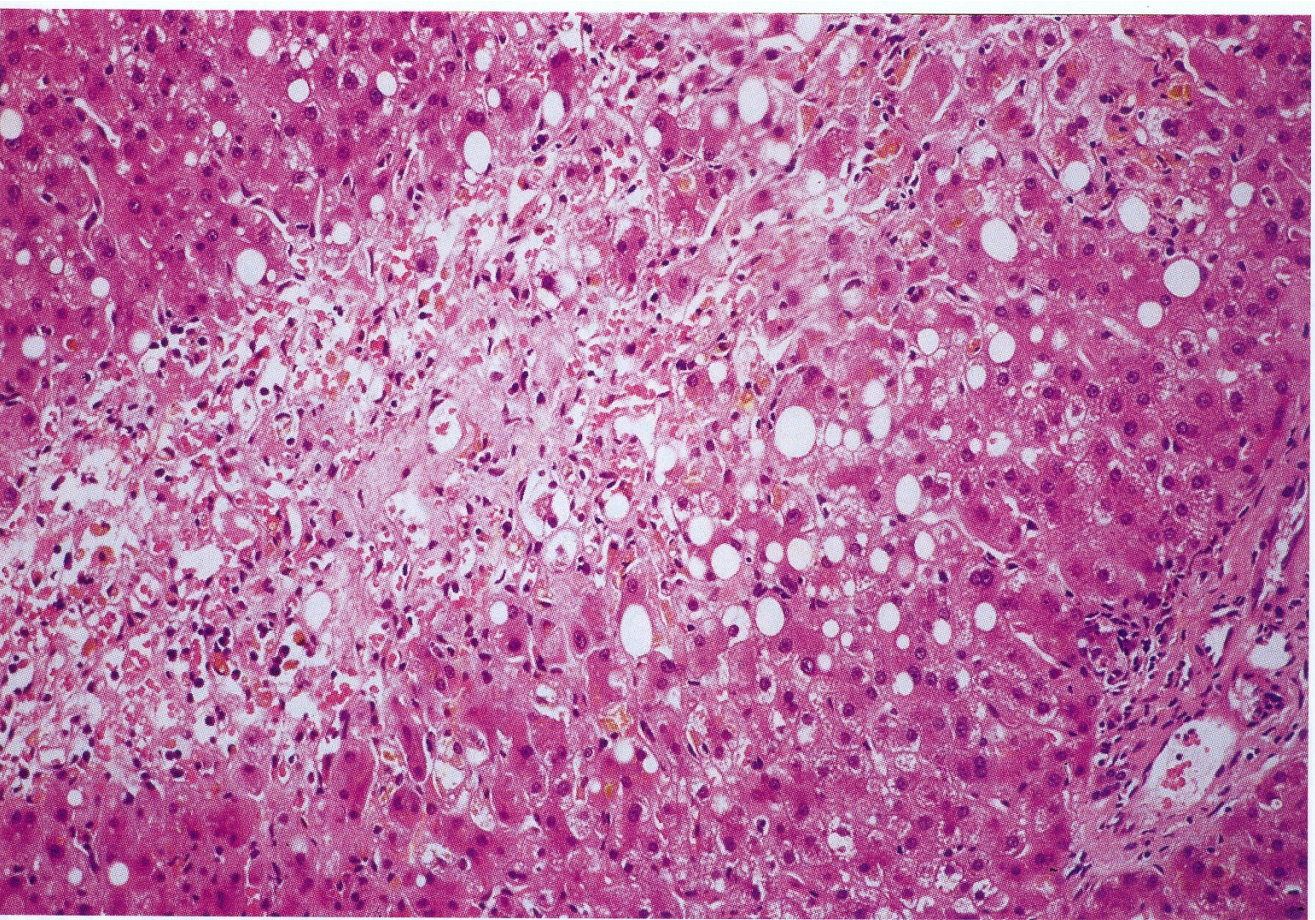
Cholestasis

- Could be mechanical or functional(obstructive and nonobstructive)
- Changes in:
  - lobular parenchyma
  - portal tracts
- Bilirubin accumulation in liver lobule
  - starts in centrilobular zone
  - pigment granules in parenchymal cells:
    - hepatocellular bilirubin stasis
  - inspissated bilirubin-stained bile plugs in dilated intercellular canaliculi:
    - canalicular bilirubin stasis
- Characteristic lab finding is elevated Alkaline phosphatase and GGT
- Bile accumulation in the liver.

Drug toxicity



A portal tract contains a granuloma with many multinucleated giant cells. The patient became jaundiced after taking phenylbutazone. (Needle biopsy, H&E.)



Drug-induced liver injury: hepatitic type.
In this acute hepatitis attributed to indometacin, necrosis in acinar zone 3 is well demarcated from the remaining parenchyma. The latter shows steatosis. Note the very mild portal inflammation (below right). (Needle biopsy, H&E.)

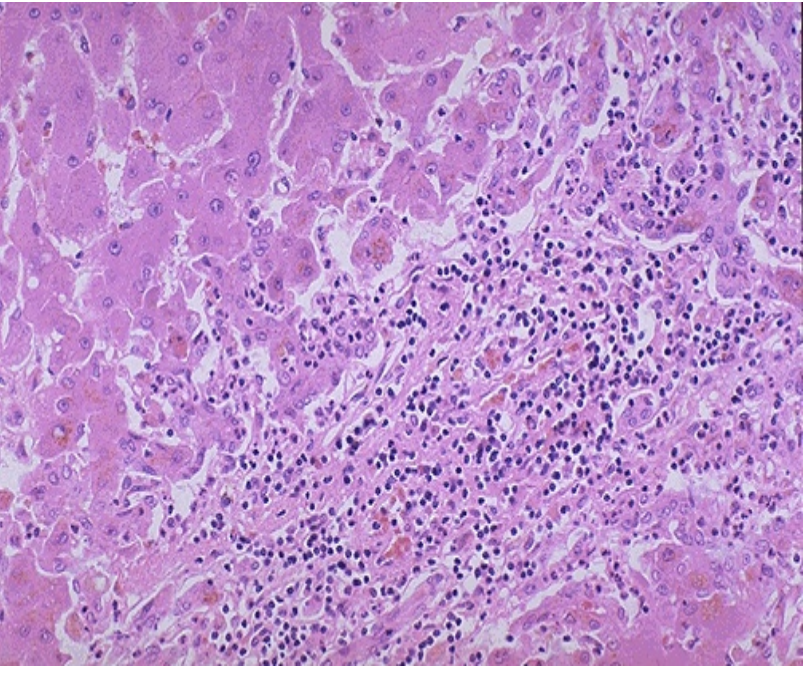
Drug Toxicity

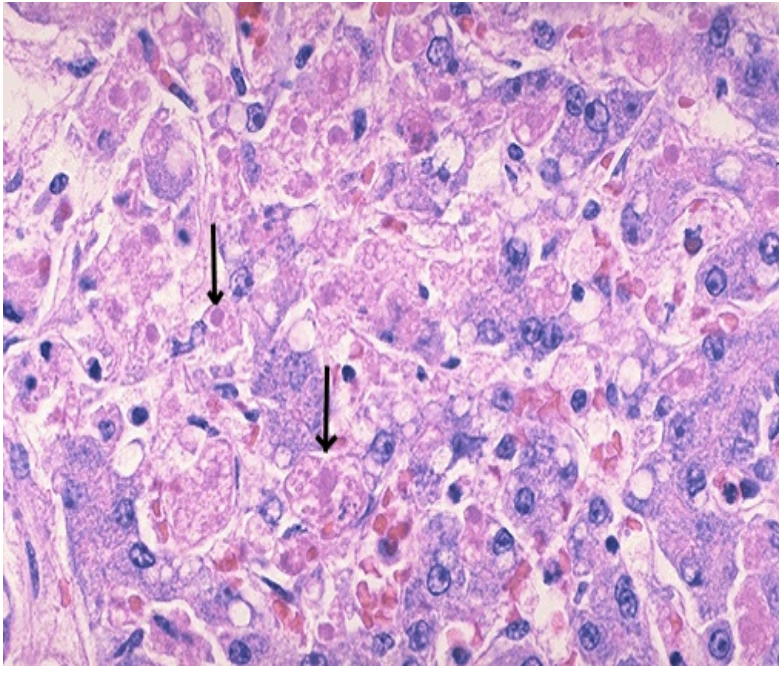
- Liver injury due to medications or other toxic agents.
- Can resemble any liver process; clinical correlation essential in diagnosis.
- Histopathology: Changes that can be seen are:
  - Cholestasis
  - Steatosis
  - Granulomas
  - Hepatocellular Necrosis
  - Predictable(intrinsic) or unpredictable(idiosyncratic)

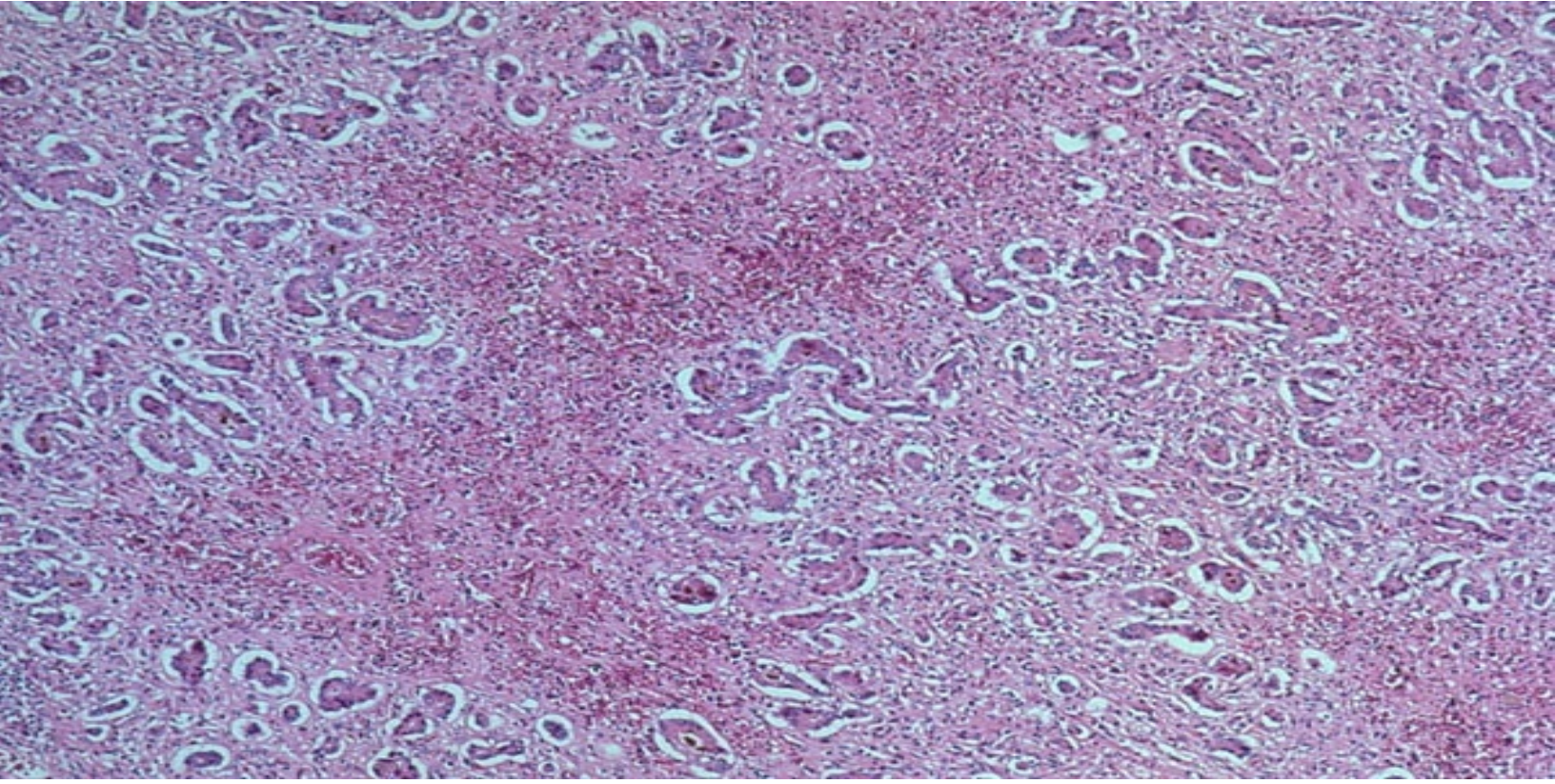
Acute Viral Hepatitis

FULMINANT HEPATITIS

Viral Hepatitis

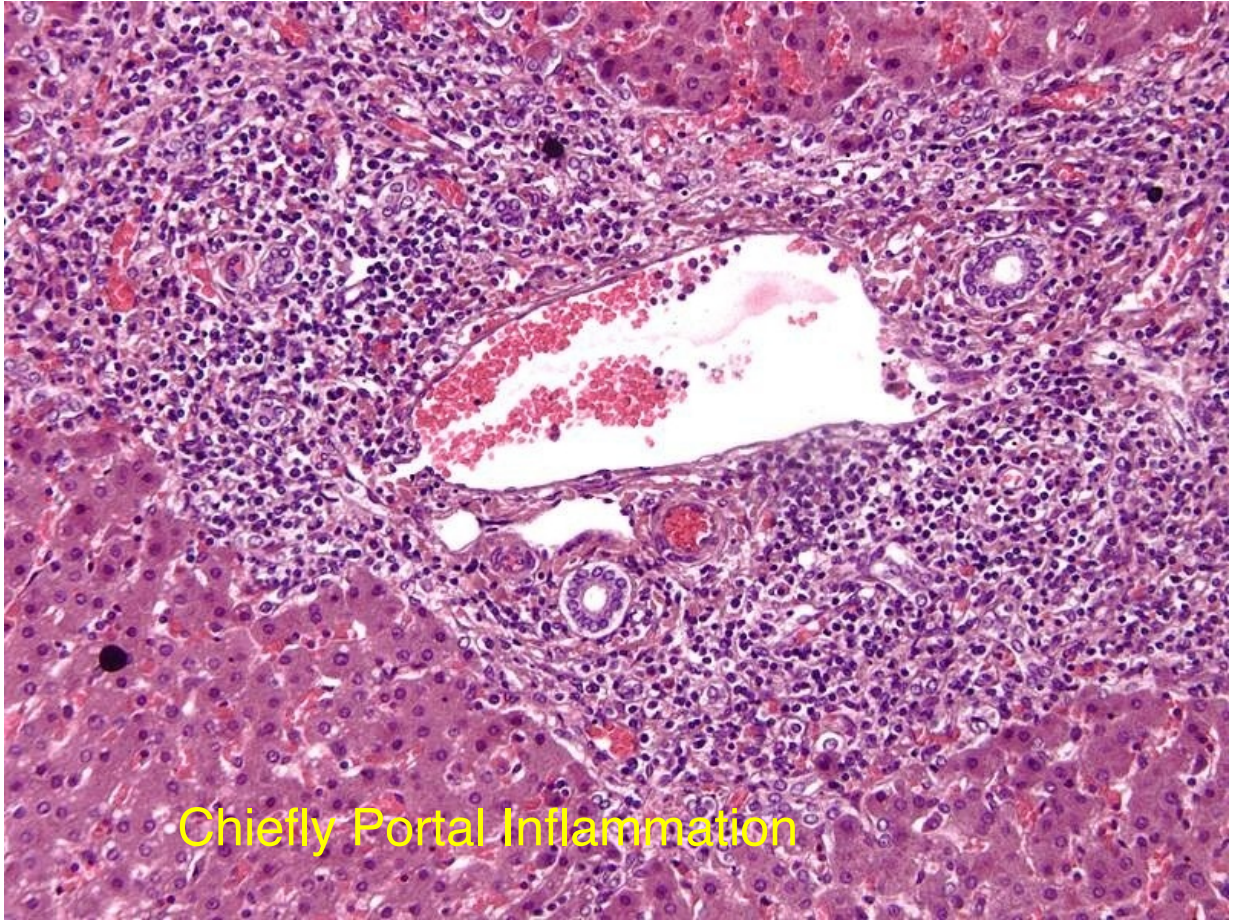


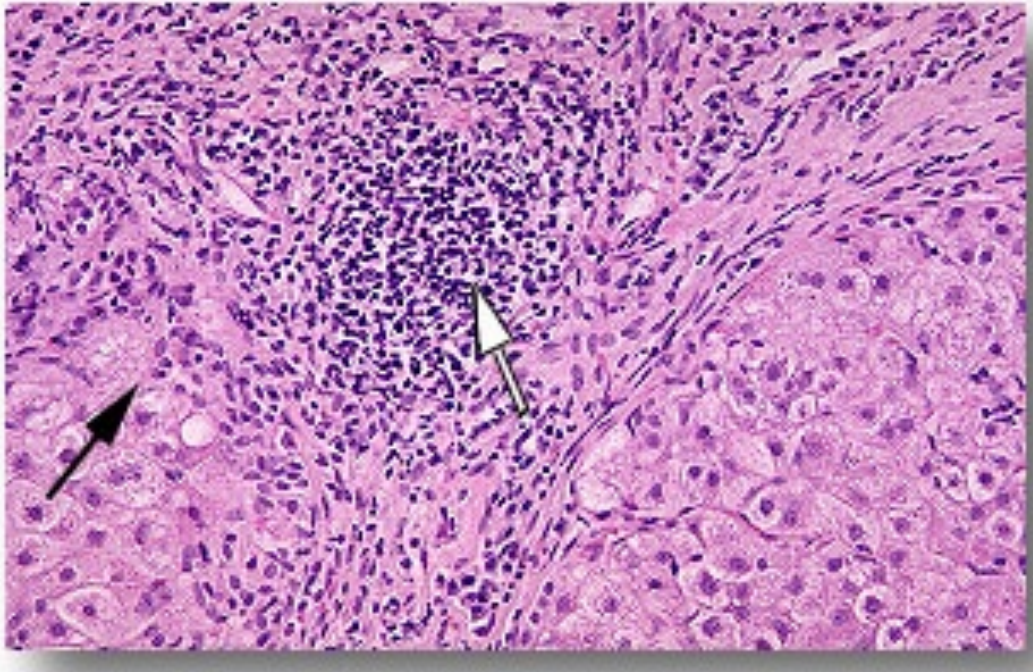




“FULMINANT” Acute Viral Hepatitis

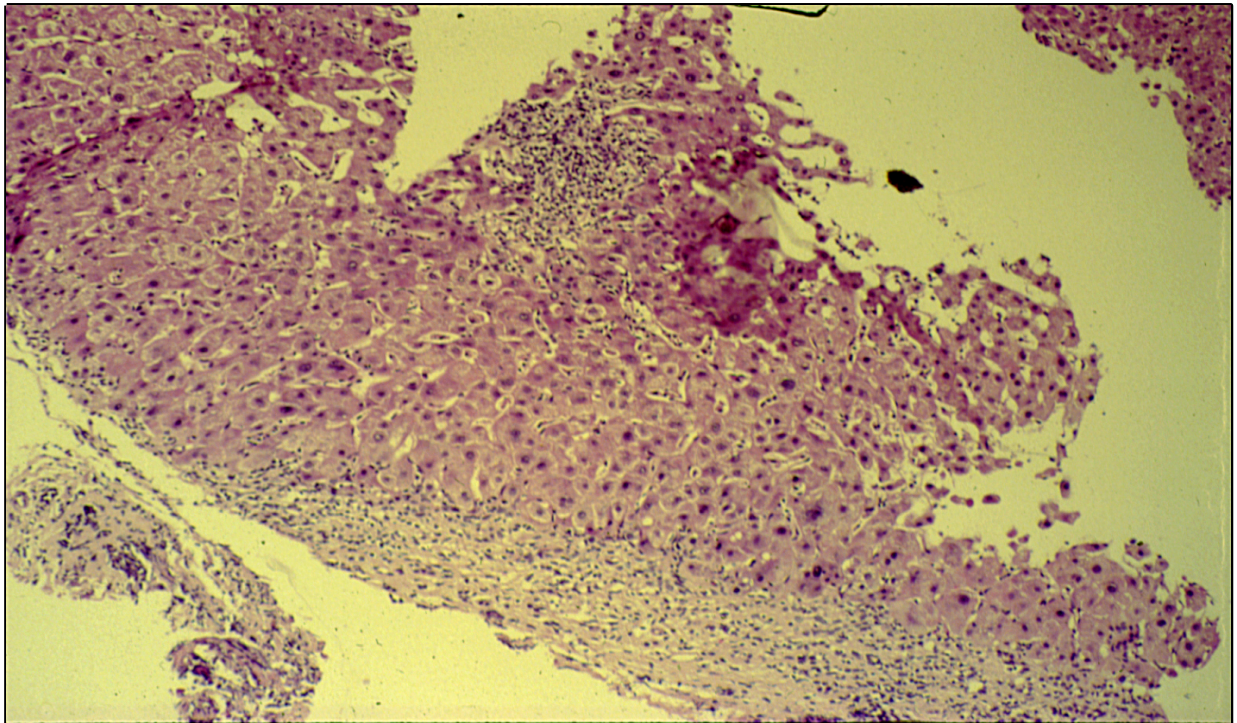
Chronic hepatitis


Chiefly Portal Inflammation

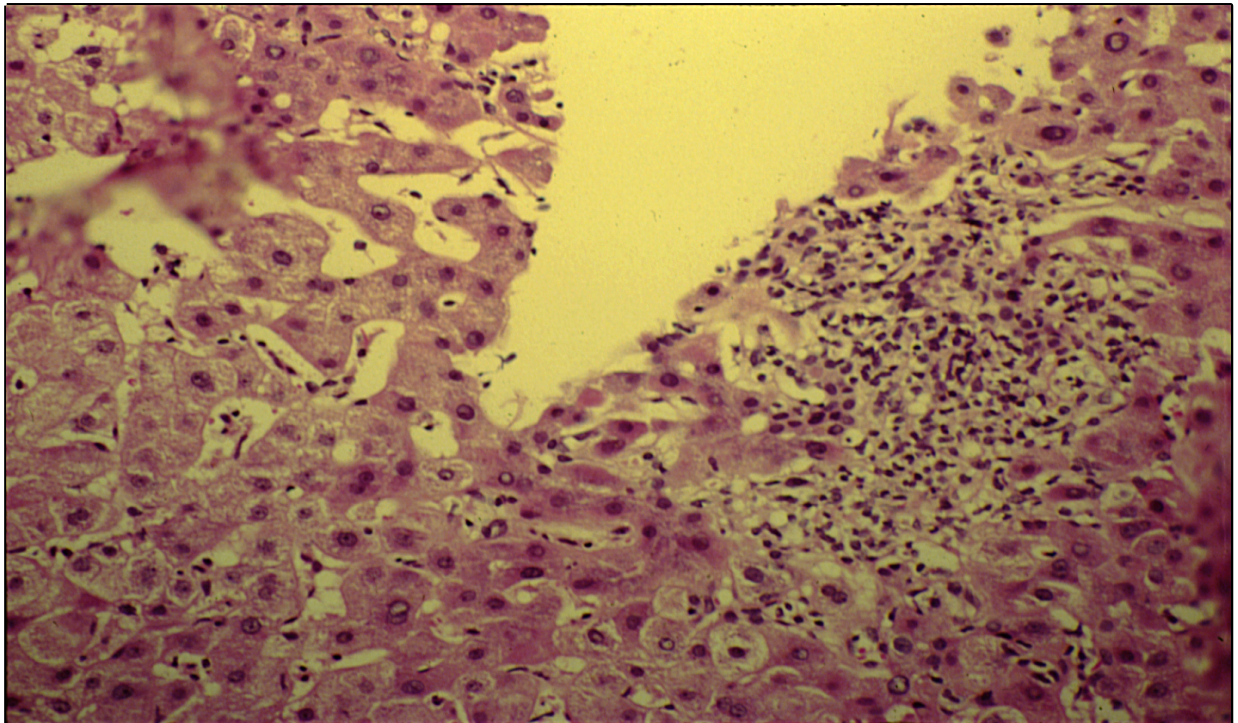


More severe portal infiltrates with sinusoidal infiltrates also

CHRONIC HEPATITIS



CHRONIC HEPATITIS



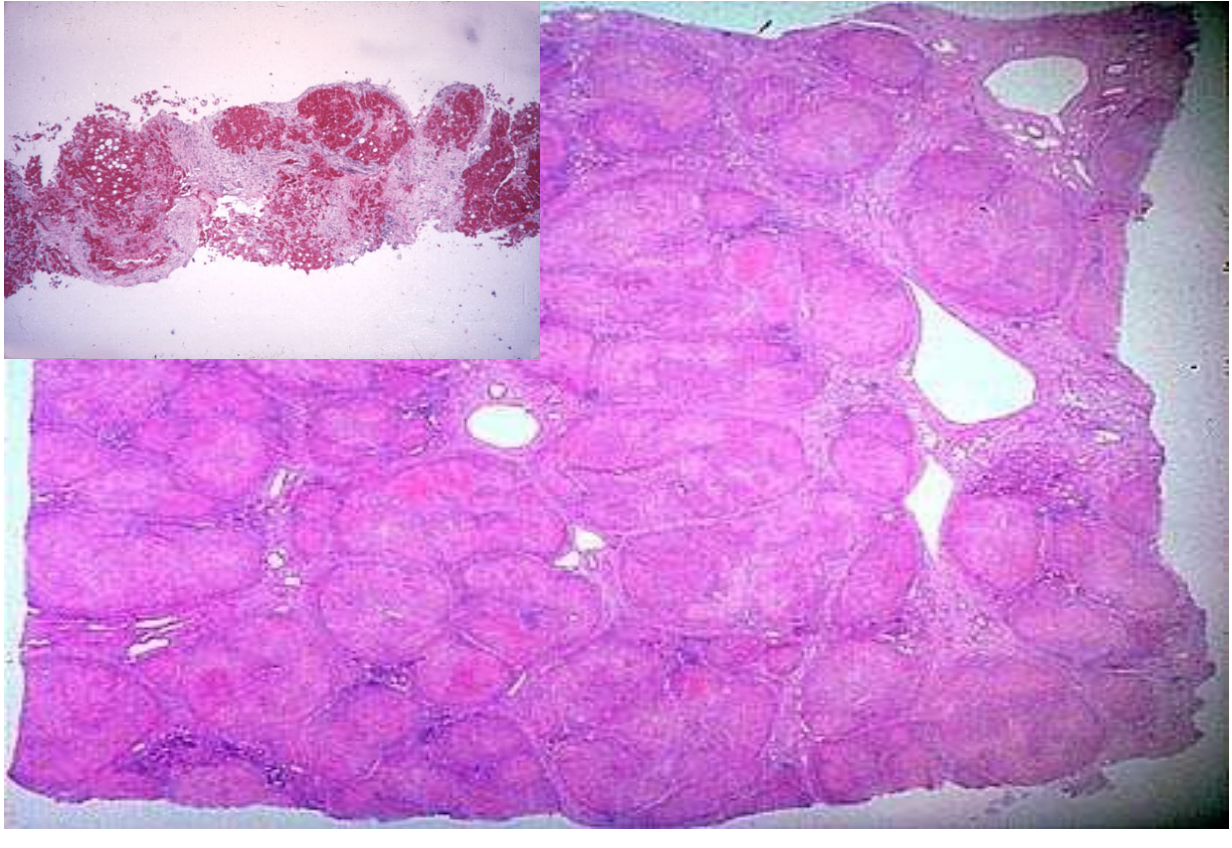
Chronic hepatitis:

Section from this liver biopsy show:

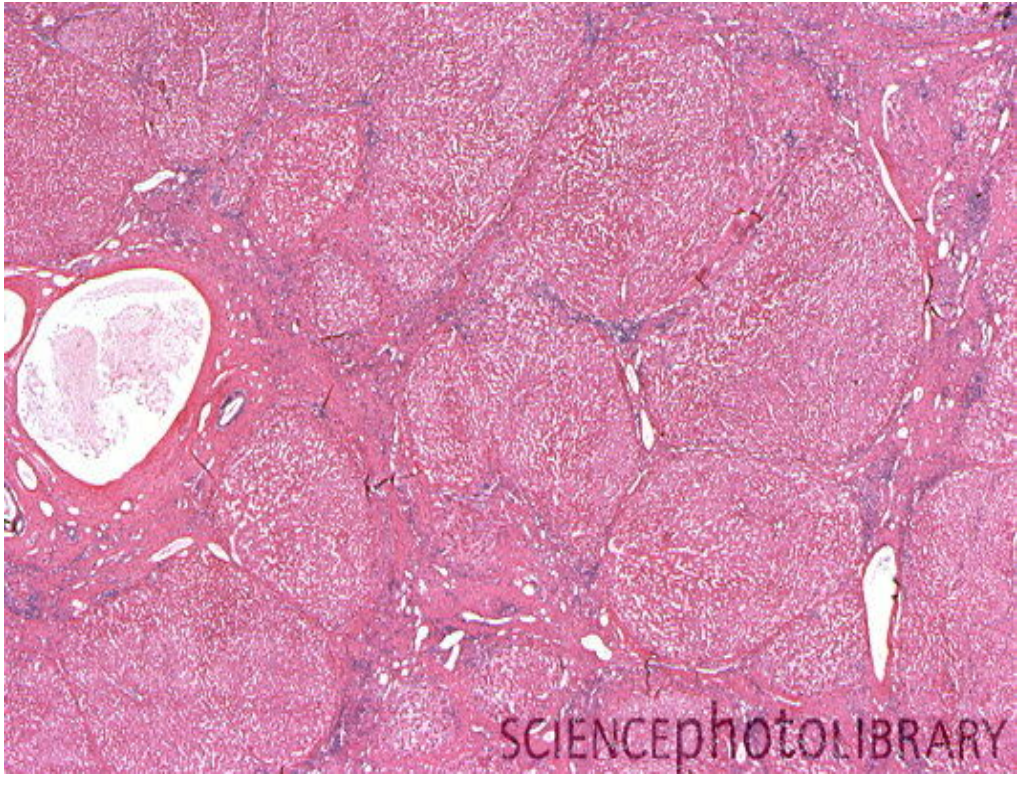
Moderate chronic inflammatory cells infiltration consisting of lymphocytes and histiocytes in both portal tracts and liver parenchyma. Piecemeal necrosis, hepatocytes swelling and “spotty” hepatocytes necrosis are also noticed. No evidence of cirrhosis or malignancy noted.

Hepatic cirrhosis

Organ: Liver Dx: macronudular cirrhosis (HBV)



IRREGULAR NODULES SEPARATED BY PORTAL-to-PORTAL FIBROUS BANDS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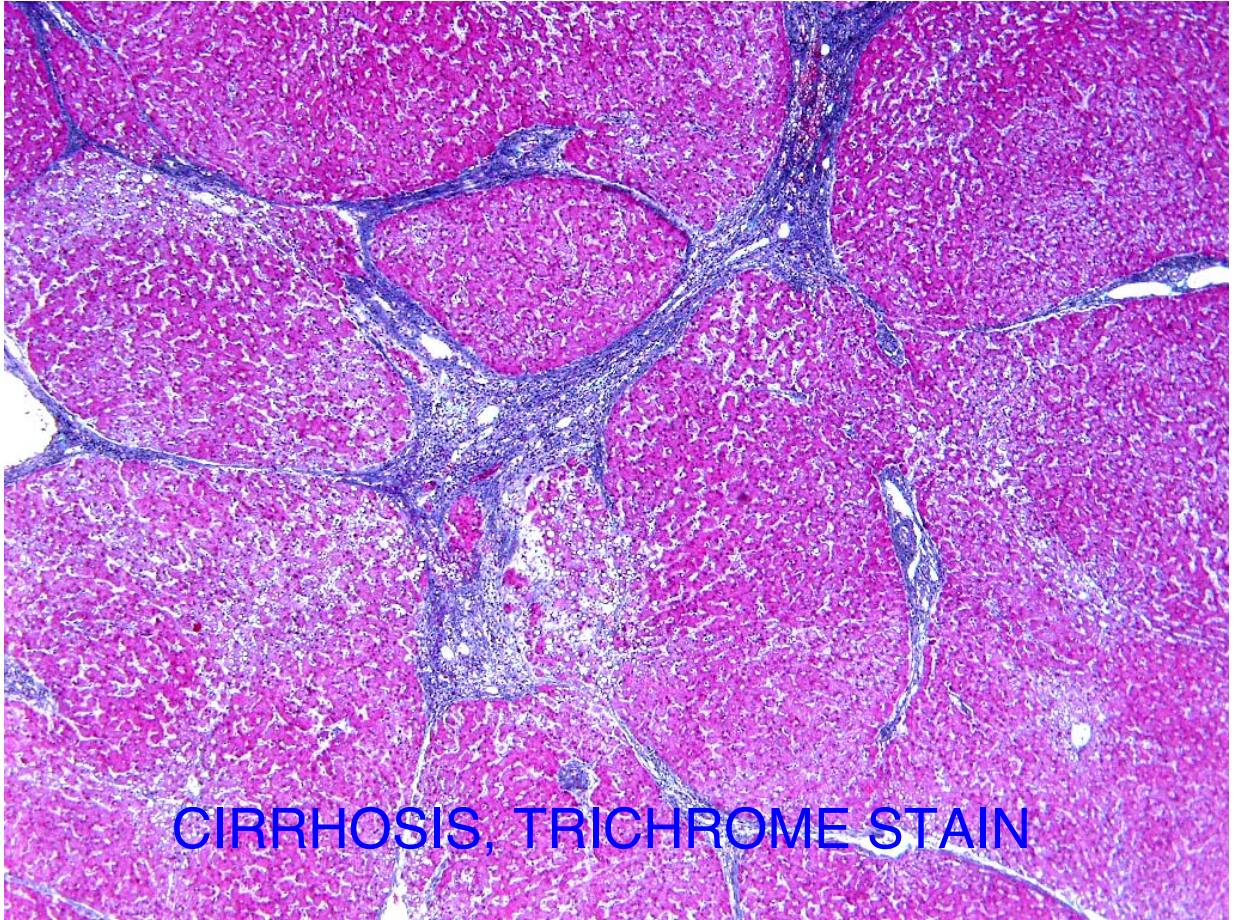


CIRRHOSIS, TRICHROME STAIN

Cirrhosis of the liver:

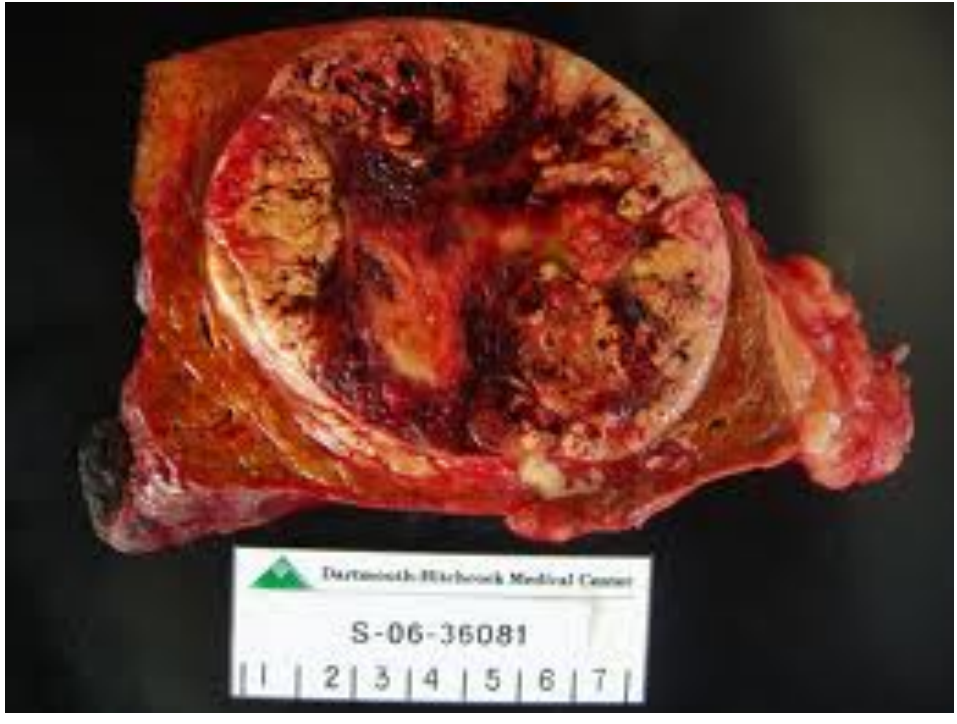
Section of liver show:

Loss of lobular architecture and formation of regenerative nodules of variable size and shape, surrounded by fibrous tissue.

Each nodules consists of liver cells without any arrangement and with no central vein.

Large number of proliferated bile ducts and chronic inflammatory cells are present in fibrous tissue.

Hepatocellular carcinoma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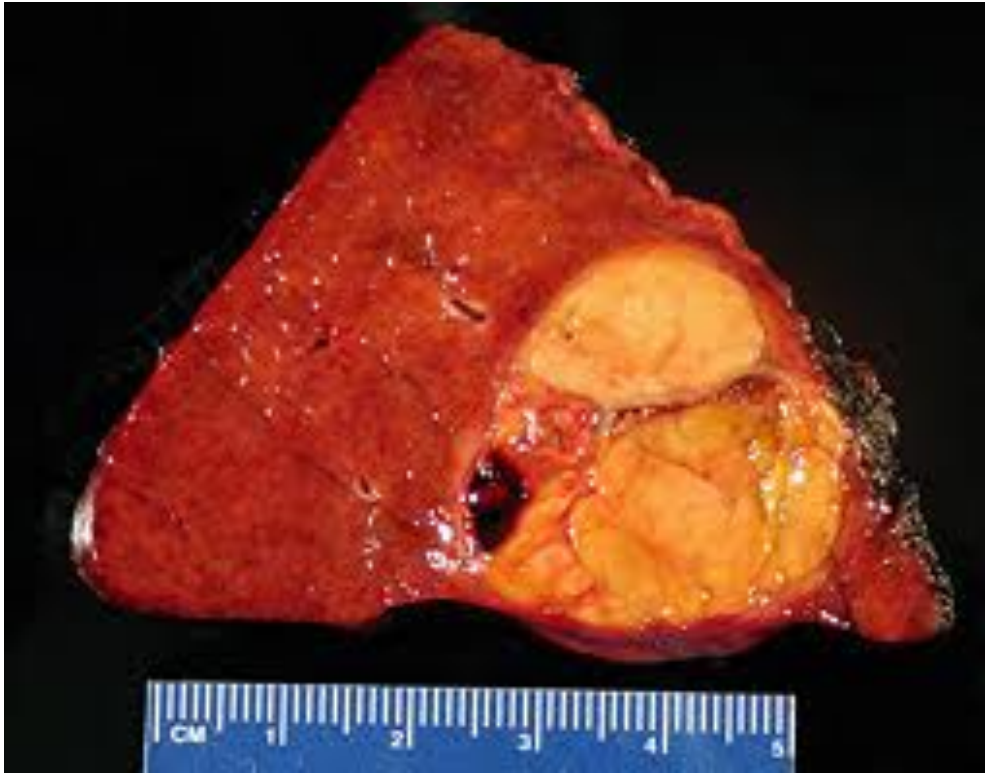
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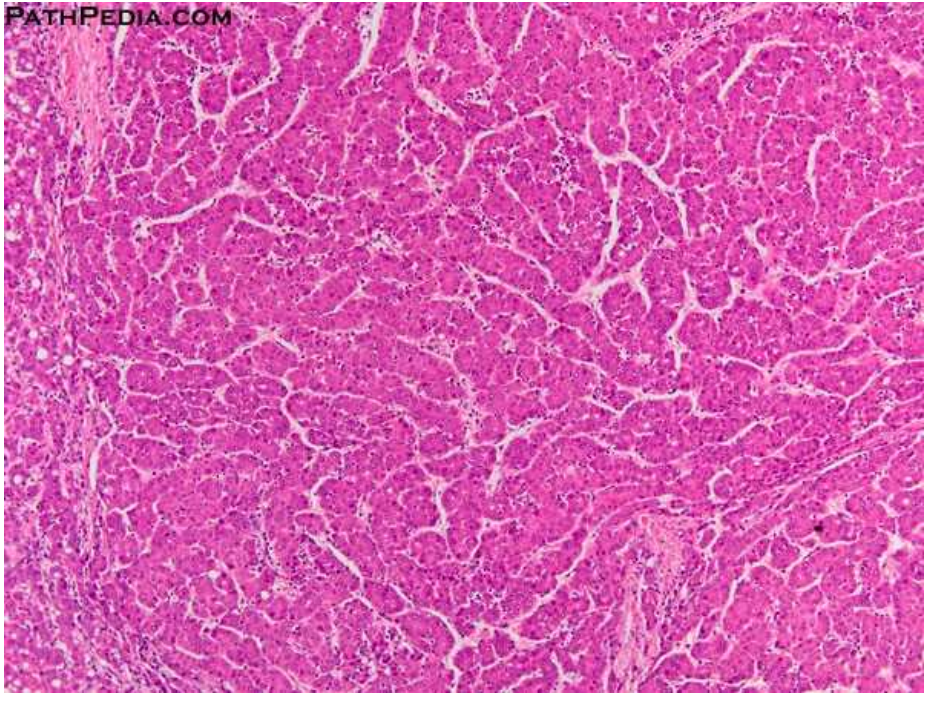
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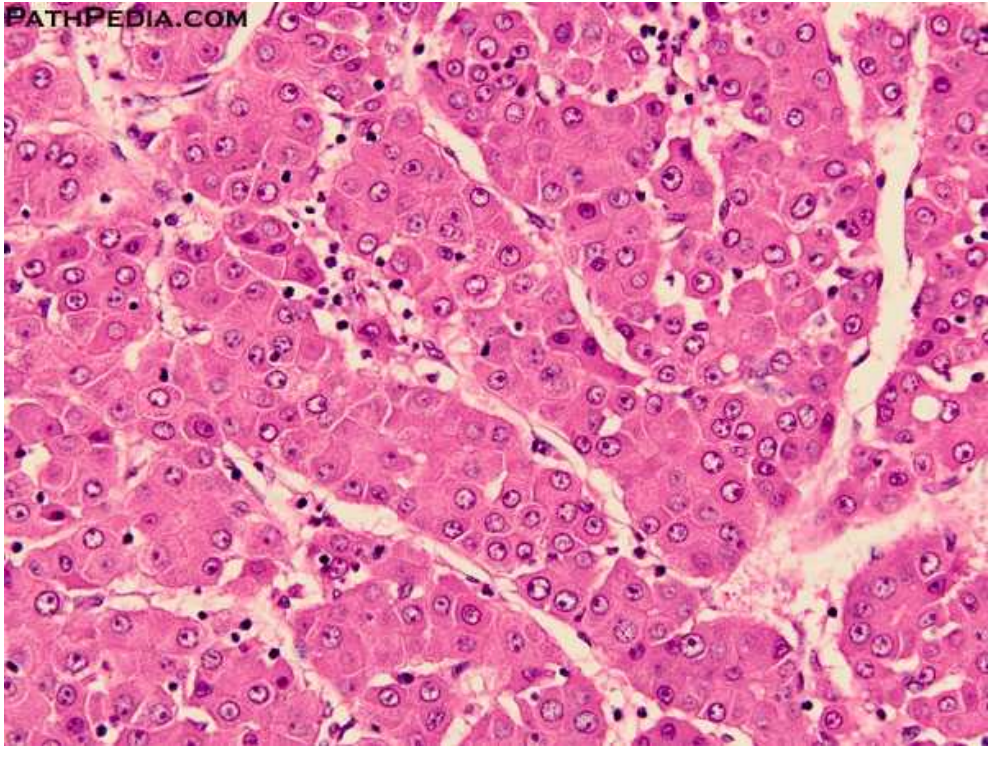
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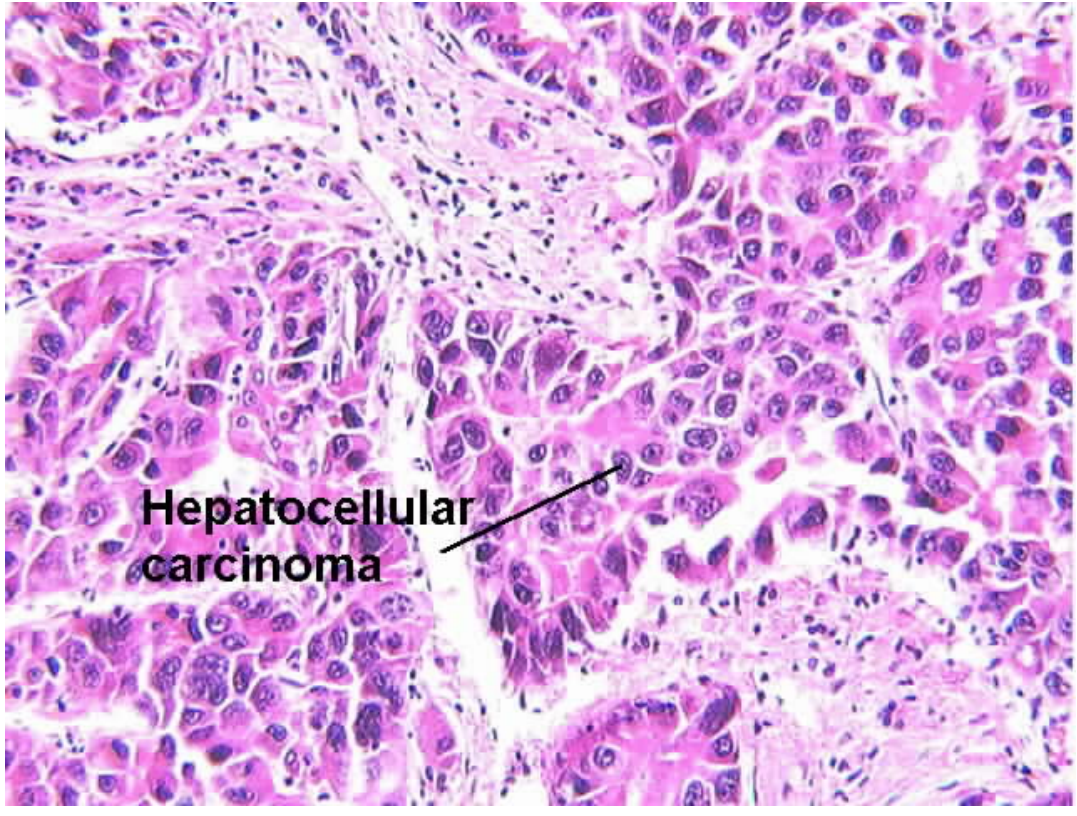
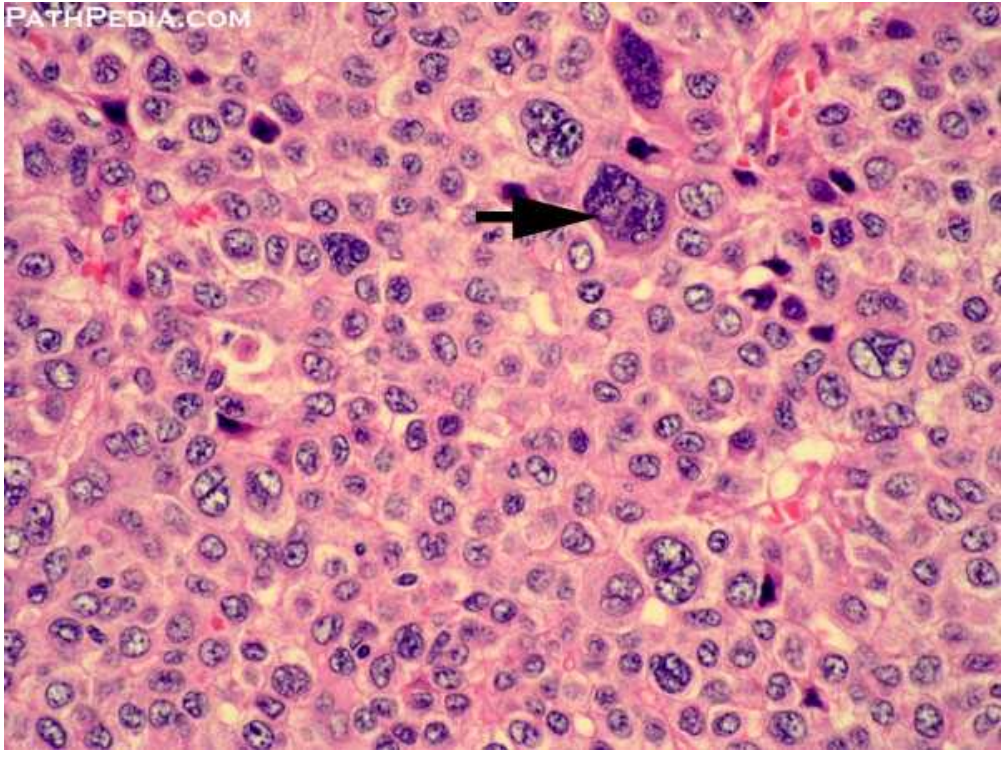

Hepatocellular
carcinoma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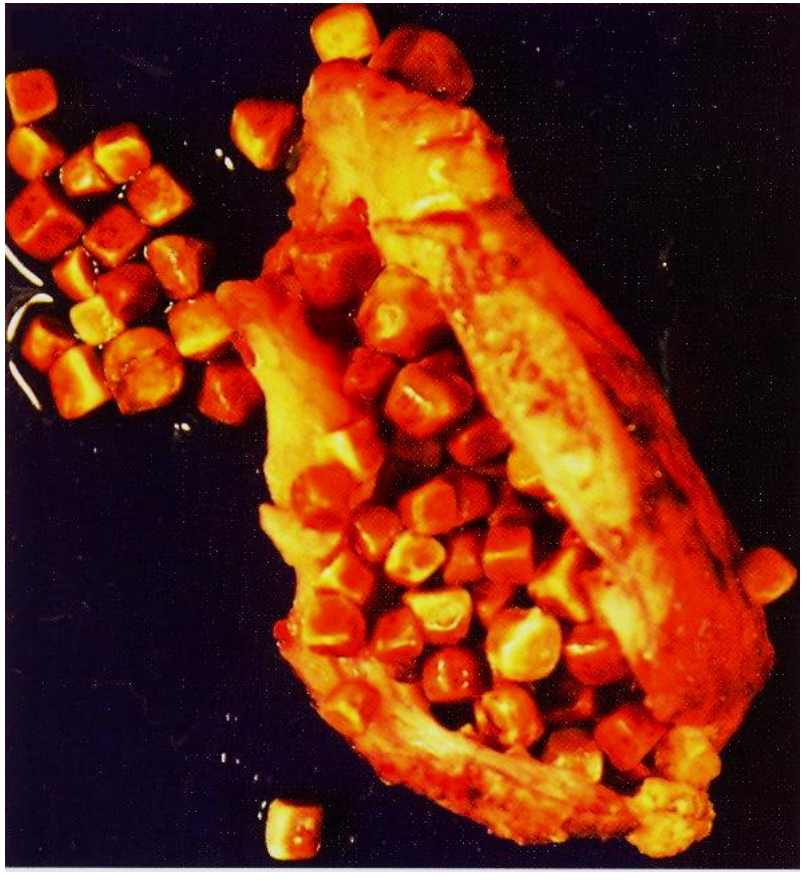
Hepatocellular carcinoma:
Section show tumour consisting of:

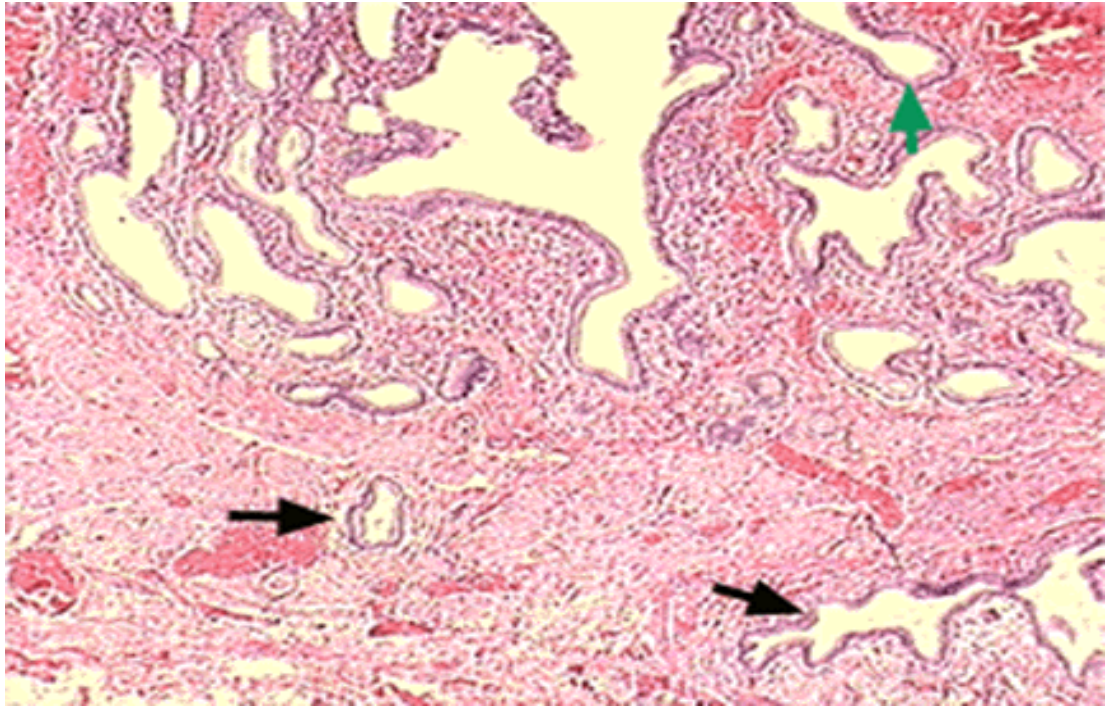
Thick cords, trabeculate and nests of malignant liver cells separated by sinusoidal spaces.

Malignant liver cells are pleomorphic, binucleated or forming giant cells with hyperchromatic nuclei .

Mitoses are numerous.

Areas of haemorrhage and necrosis are present.





Chronic cholecystitis:

Section of gallbladder wall shows:

Irregular mucosal folds and foci of ulceration in mucosa.

Wall is penetrated by mucosal glands which are present in muscle coat (Rokitansky- Aschoff sinuses).

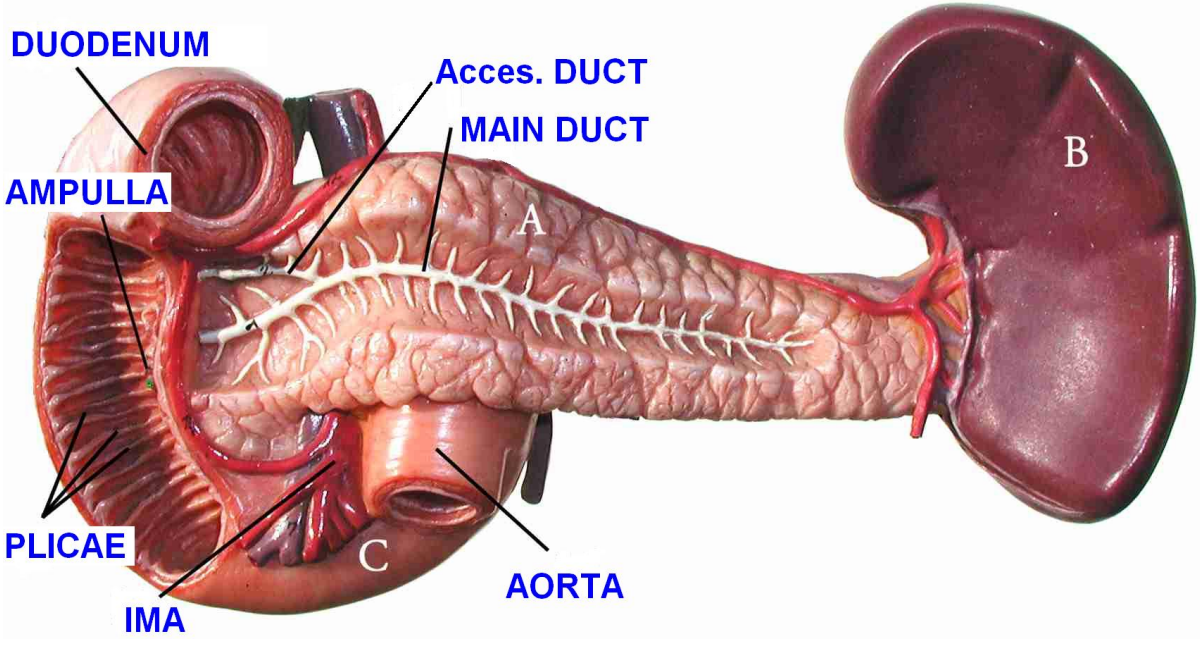
All layers show chronic inflammatory cells infiltration and fibrosis.

Pancreas

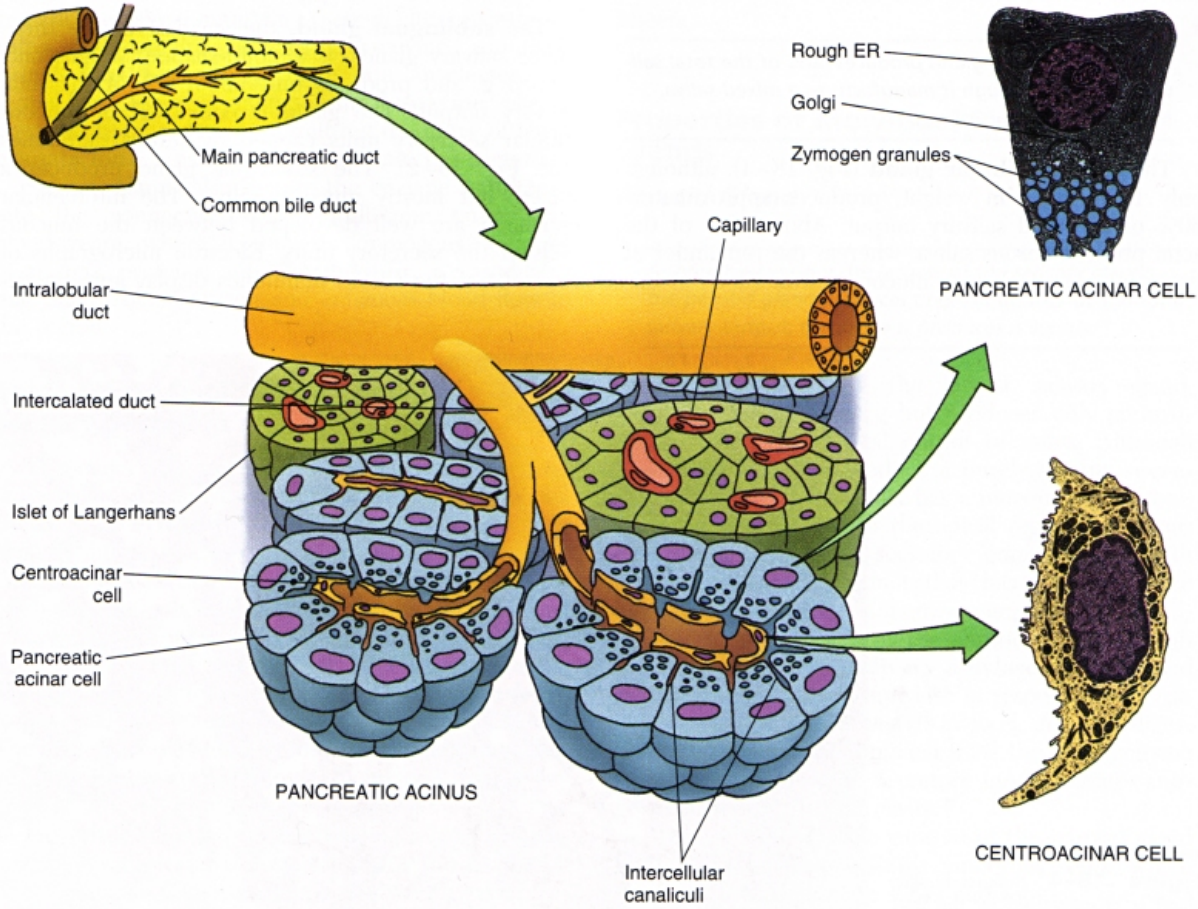
Chronic pancreatitis

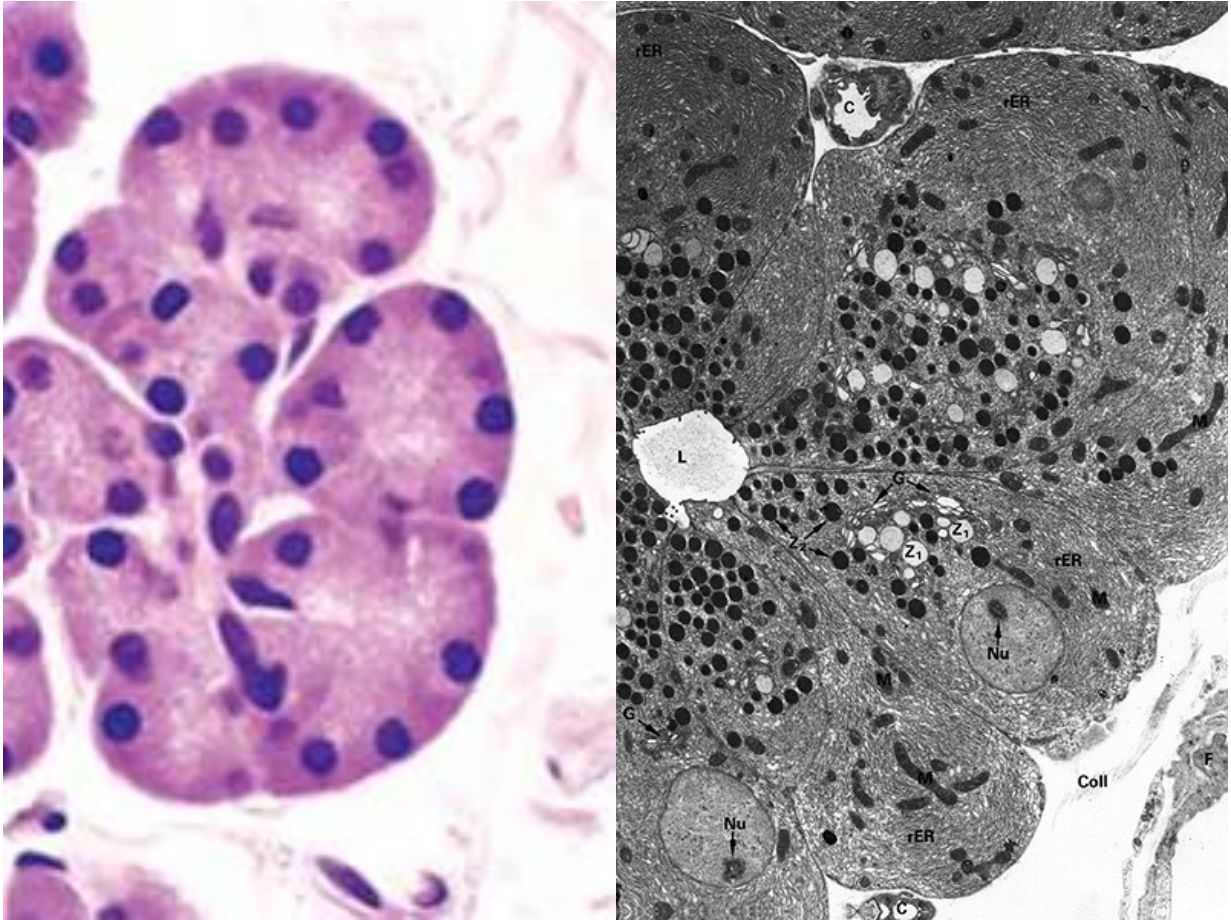
Pancreatic adenocarcinoma

Normal anatomy and histology



PANCREAS


Main pancreatic duct
Common bile duct
Rough ER
Golgi
Zymogen granules
PANCREATIC ACINAR CELL
Capillary
Intralobular duct
Intercalated duct
Islet of Langerhans
Centroacinar cell
Pancreatic acinar cell
PANCREATIC ACINUS
CENTROACINAR CELL
Intercellular canaliculi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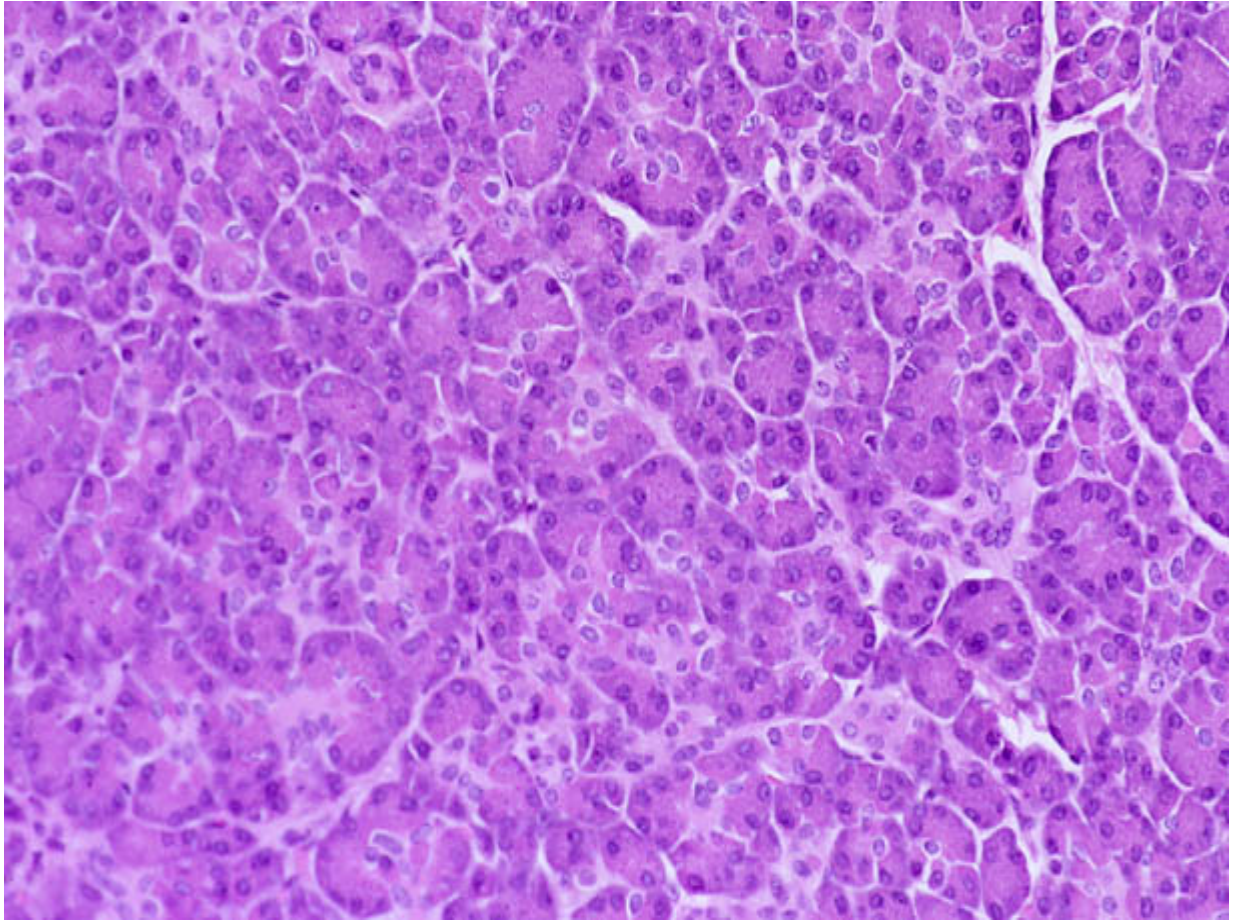
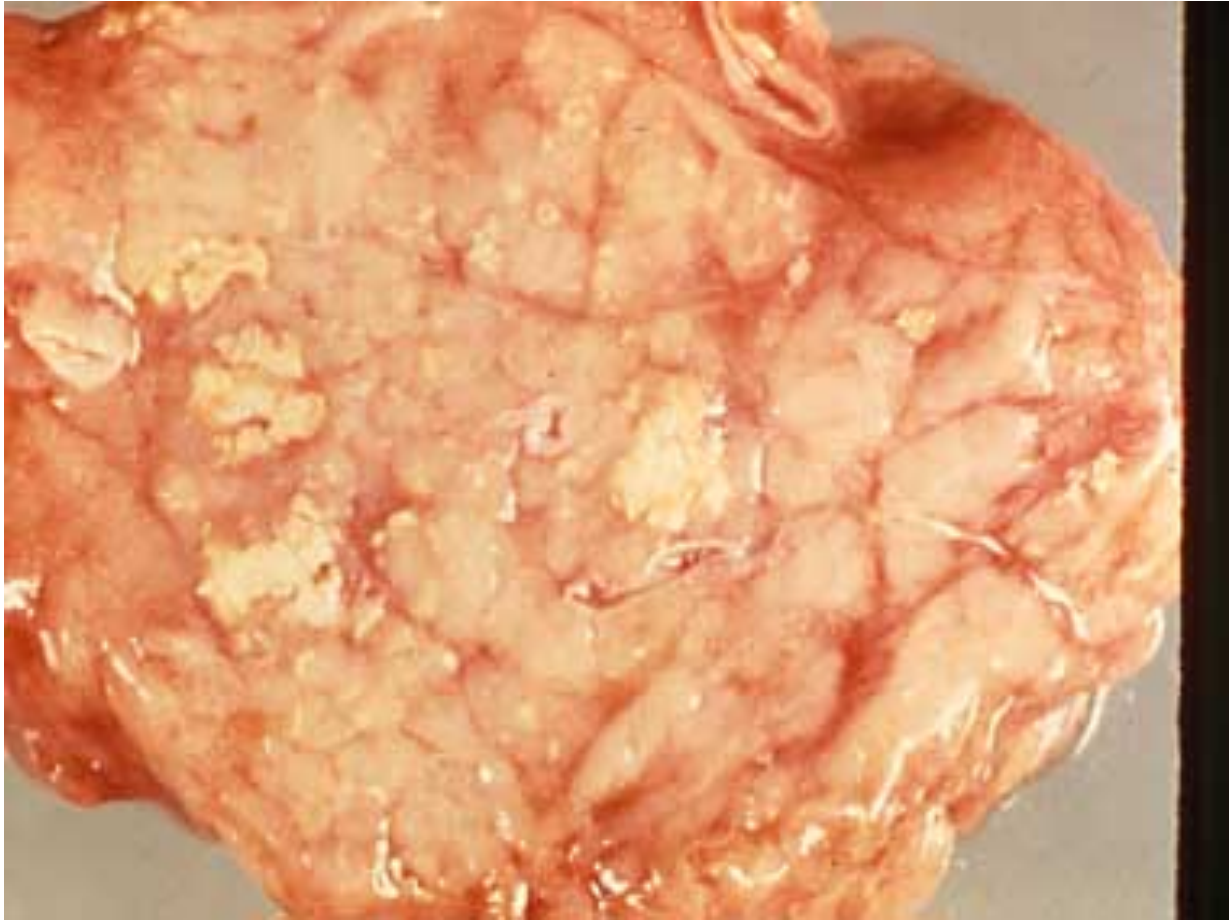
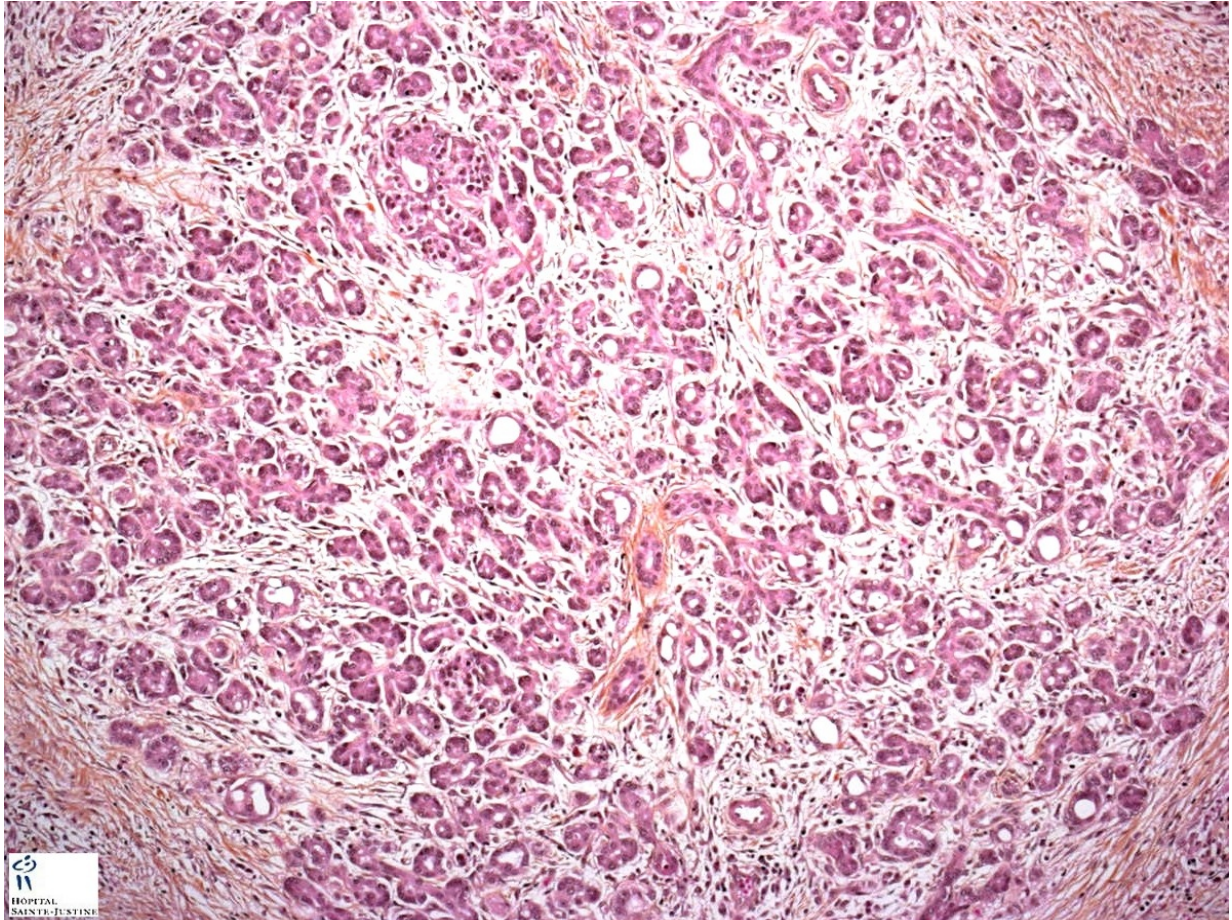


Gross and histopathology

Chronic pancreatitis

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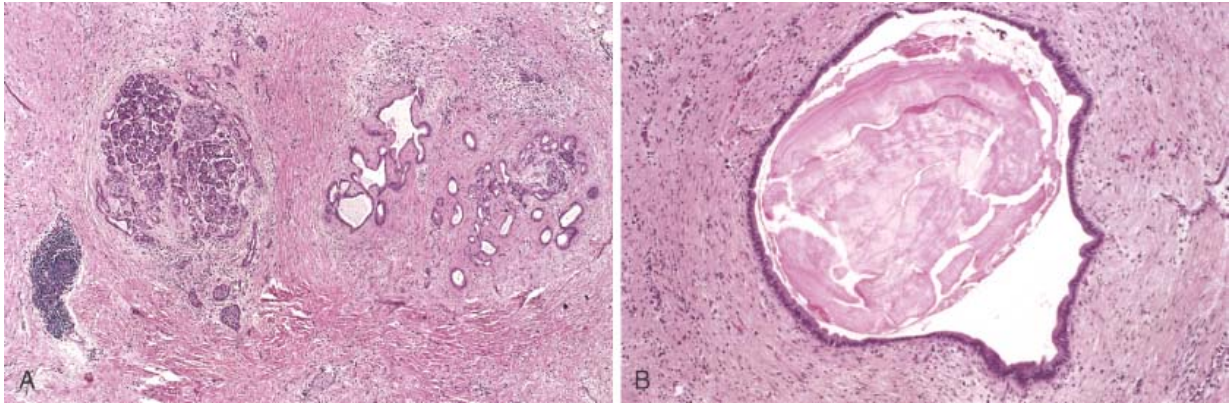
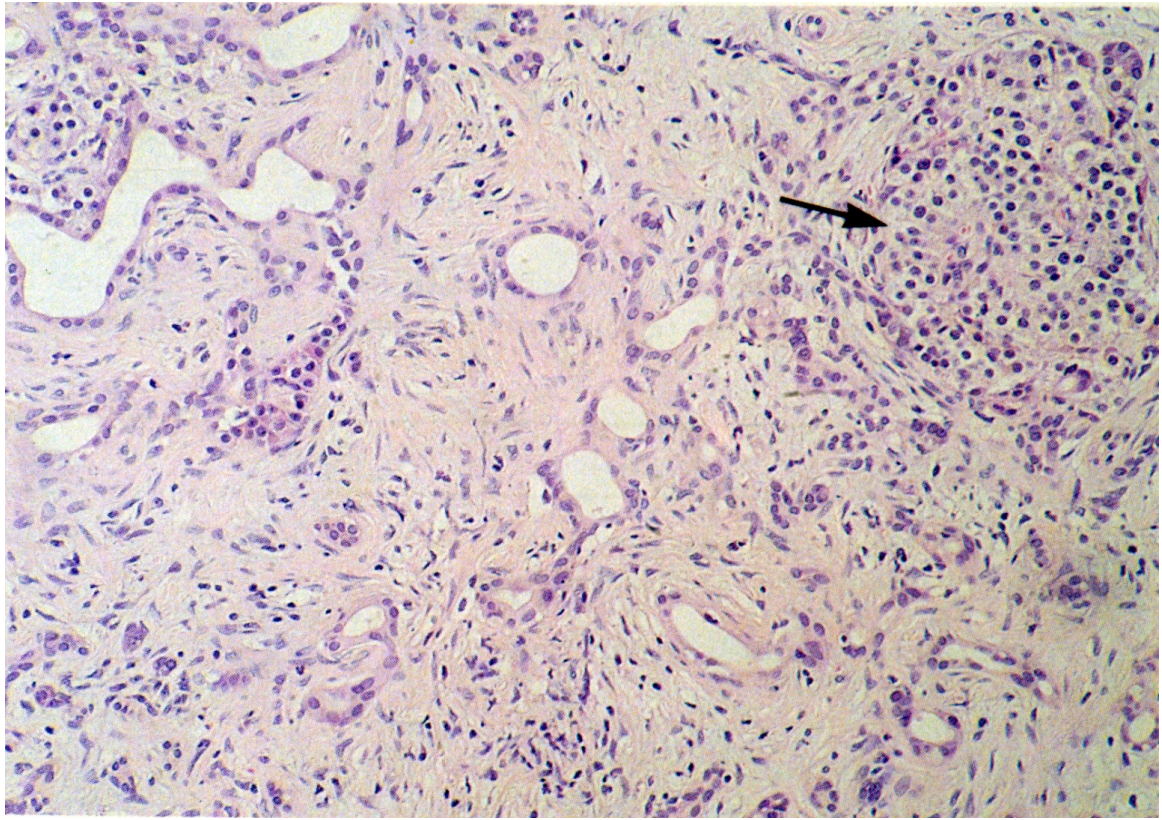
SAINTE-JUSTINE

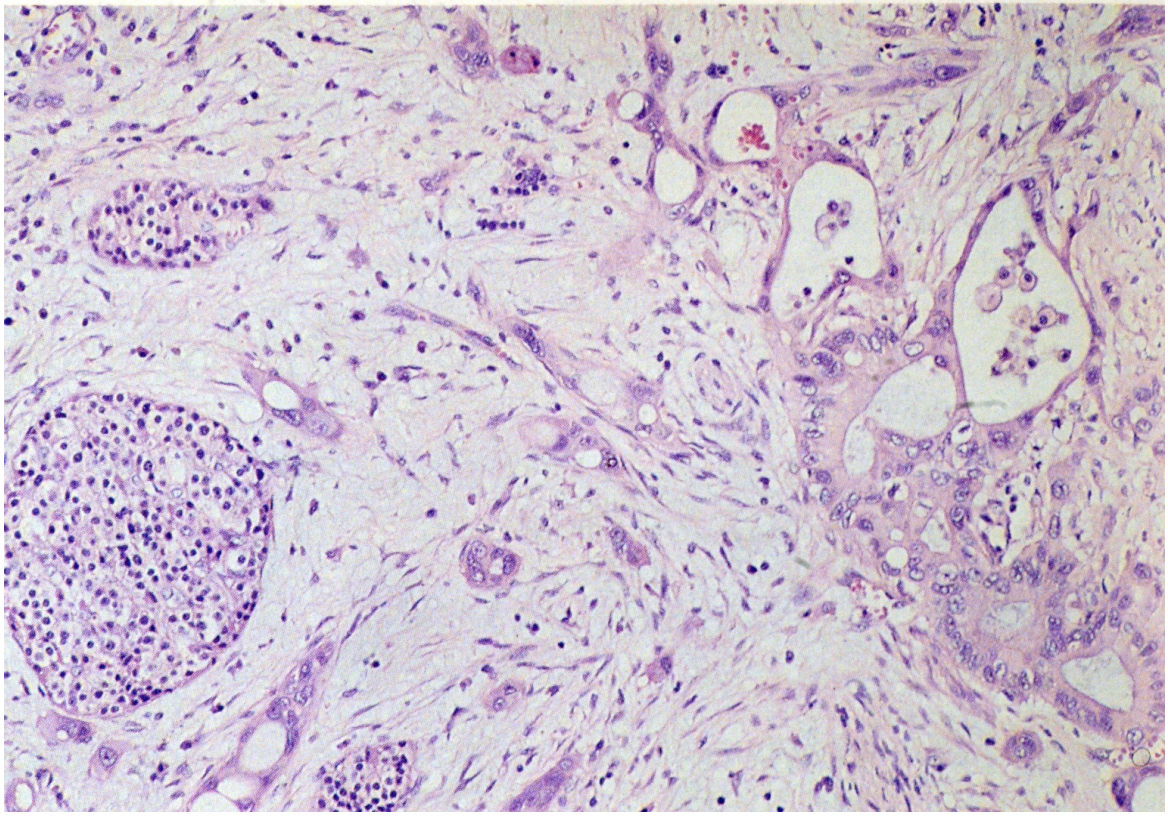


CHRONIC PANCREATITIS

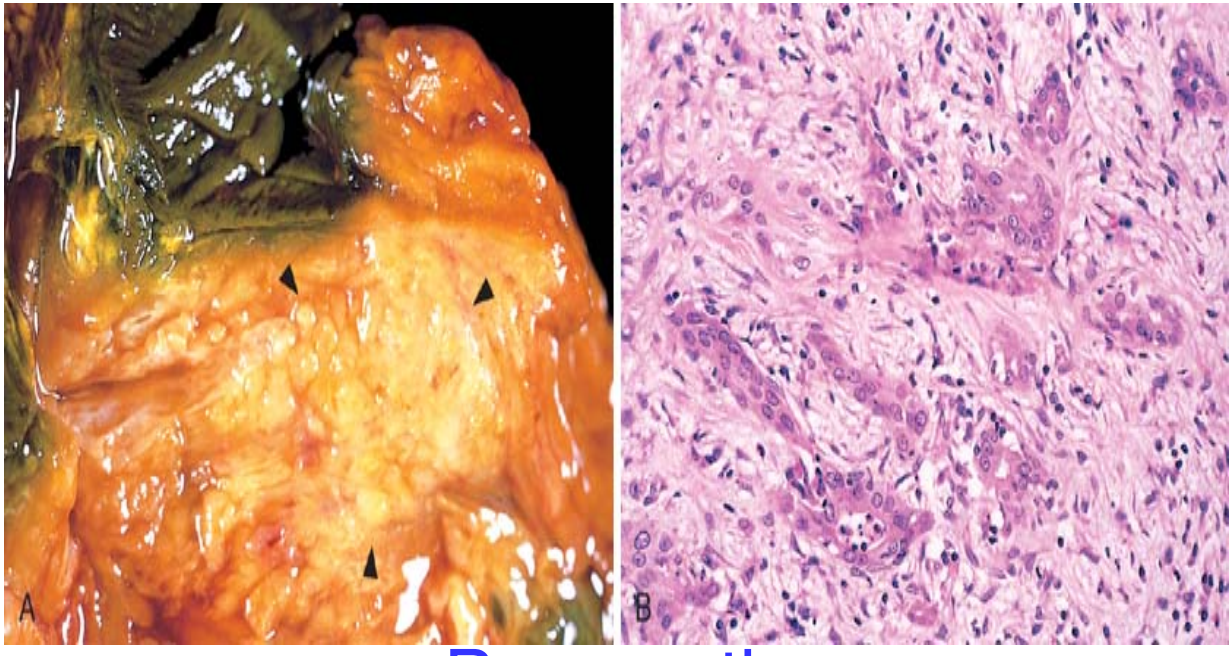


Chronic pancreatitis

Pancreatic adenocarcinoma



Pancreatic adenocarcinoma



Pancreatic

Adenocarcinoma