HEPATIC NEOPLASMS.

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HEPATIC MASSES COME TO ATTENTION FOR A VARIETY OF REASONS:

- They may generate epigastric fullness and discomfort .
- can detected by routine physical examination.
- Abnormal radiographic studies for other indications.

- Hepatic masses include:
- nodular hyperplasia's .
- true neoplasms
  - Benign Neoplasms
  - Malignant Neoplasms

FOCAL NODULAR HYPERPLASIA (FNH)

- Solitary or multiple hyperplastic hepatocellular nodules that may develop in the noncirrhotic liver.

- They arise from local alterations in hepatic parenchymal blood supply, such as :

❖ arteriovenous malformations.

❖ inflammatory or posttraumatic obliteration of portal vein radicles.

❖ compensatory augmentation of arterial blood supply.

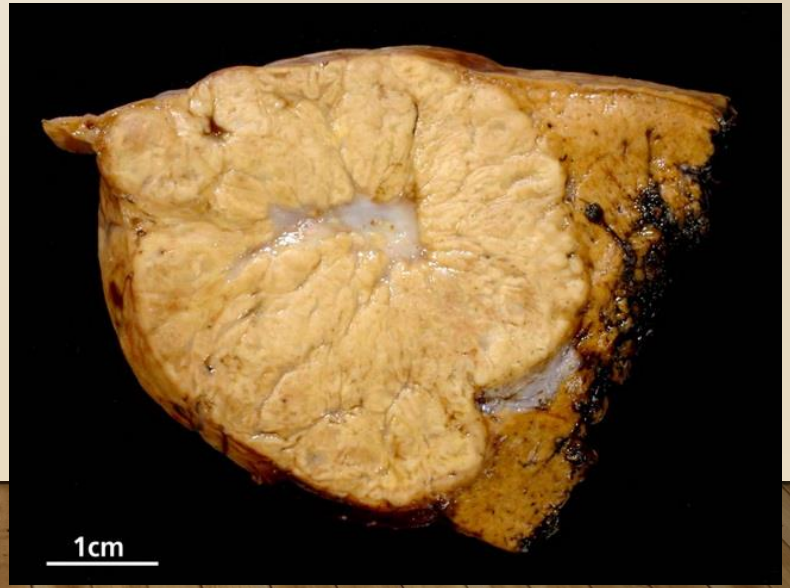
FOCAL NODULAR HYPERPLASIA: GROSS.

- well-demarcated, poorly encapsulated nodule in an otherwise normal liver.
- there is a central gray-white, depressed stellate scar from which fibrous septa radiate to the periphery.

in the picture the scar is found in the center of the mass

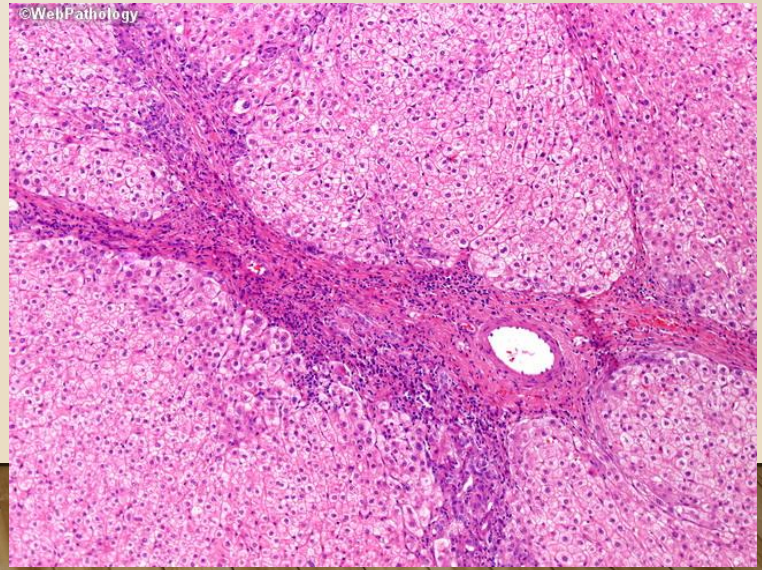
non cirrhotic liver (there is no nodules)

in resection the surgeon removes the affected area (mass) and parts of the normal liver



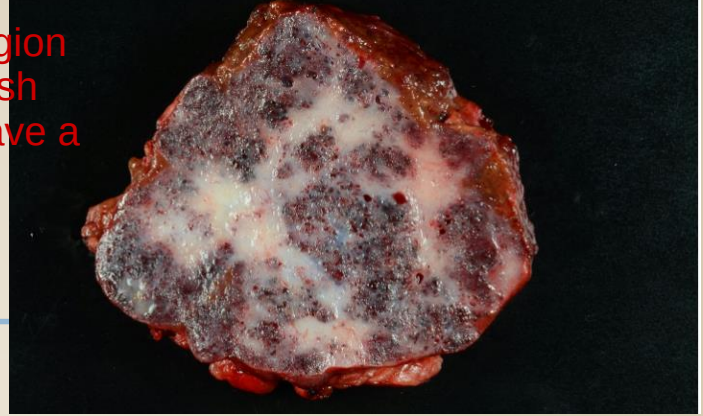
FOCAL NODULAR HYPERPLASIA: MICROSCOPICALLY.

- The central scar contains large abnormal vessels and ductular reactions along the spokes of scar.
- The hyperplastic regions are composed of normal hepatocytes separated by thickened sinusoidal plates



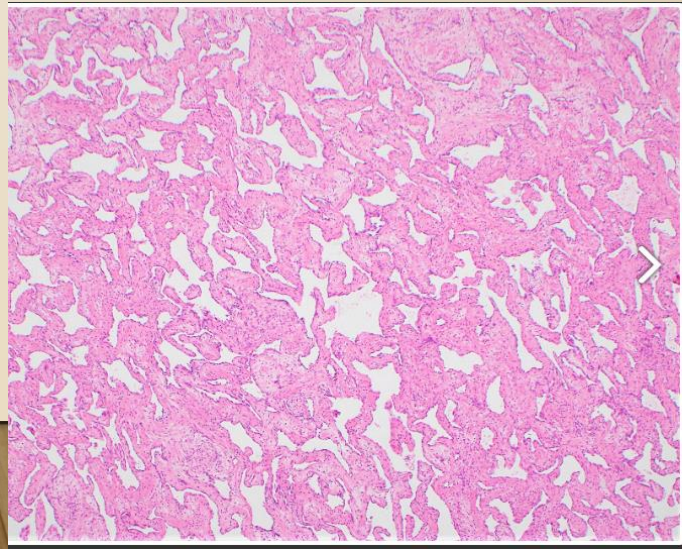
BENIGN NEOPLASMS

vascular region, when cutting the region blood will be seen (if the blood is fresh it will have a red color, if old it will have a brown color)



1. Cavernous hemangiomas:

- the most common benign tumor of the liver.
- Vast majority of hemangiomas are asymptomatic and require no intervention.
- **Gross description:**
- Well circumscribed with red-brown, spongy / honeycombed cut surface
- **Microscopic:**
- Circumscribed proliferation of variably sized, dilated and thin walled vessels



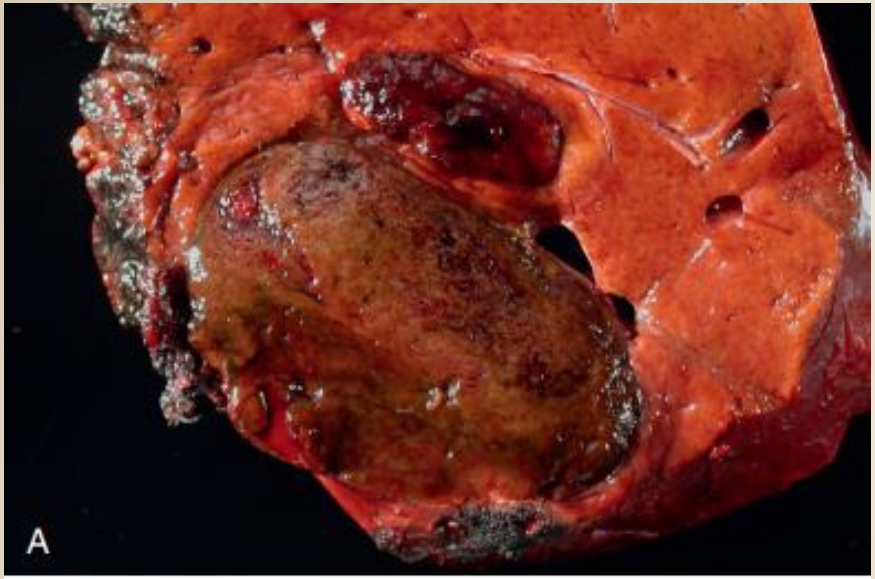
2. HEPATOCELLULAR ADENOMAS

- Benign neoplasms developing from hepatocytes.
- may be detected incidentally or cause symptoms (pain, which may be caused by pressure placed on the liver capsule by the expanding mass or hemorrhagic necrosis of the tumor as it outstrips its blood supply).
- Hepatocellular adenomas occasionally rupture, an event that may lead to life-threatening intraabdominal bleeding.
- Sex hormone exposure (e.g., oral contraceptive pills) markedly increases the frequency of hepatic adenoma.

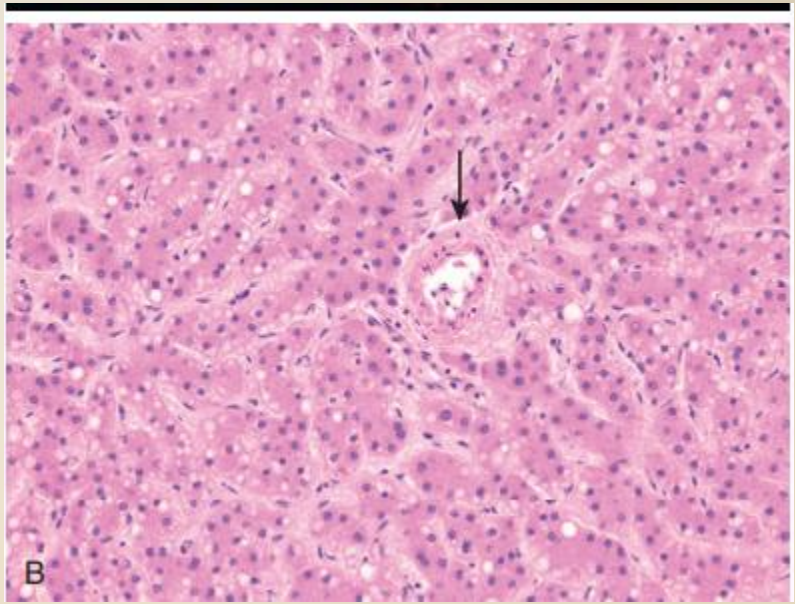
ocp

most common risk factor affecting the reproductive age group

normal liver not cirrhotic



charecteristic feauture of hepatocellular adenoma under the microscope is the absence of portal tracts



the difference between it and cavernous hemangioma is that CH has a honey comb cut surface

single

•solitary well circumscribed uncapsulated lesion.

Microscopic view showing cords of hepatocytes, with an arterial vascular supply (arrow) and no portal tracts.

MALIGNANT NEOPLASMS

- Malignant tumors occurring in the liver can be:
- primary.
  - arise from hepatocytes (hepatocellular carcinoma (HCC).
  - Arise from bile duct origin, cholangiocarcinomas

tumor of structure in the liver

- metastatic.

all cirrhotic patients should do screenings every 6 months (doppler ultrasound) to make sure there are no malignant transformations
to see alfa fetal proteins which is a tumor marker

HEPATOCELLULAR CARCINOMA (HCC)

aflatoxin is a mycotoxin

- Primary malignancy of liver with hepatocellular differentiation.
- 80% of hepatocellular carcinoma cases arise in cirrhosis.
- Risk factors:
- Chronic liver disease leading to cirrhosis; most common etiologies leading to this include:

✓ chronic viral hepatits (HBV and HCV).

✓ heavy alcohol consumption.

hypertension and dyslipidemia are also examples

✓ Metabolic syndrome: obesity, diabetes mellitus, and NAFLD. non alcoholic fatty disease

✓ toxic injuries (aflatoxin, it synergizes with HBV (and perhaps also with HCV) to increase risk further.)..

✓ Inherited disorders, particularly hereditary hemochromatosis and α1AT deficiency, and to a lesser degree Wilson disease

PATHOGENESIS

- HCC is induced by acquired driver mutations in :

overexpression of oncogenes

- Oncogenes: Gain of function mutations in beta-catenin , identified in up to 40% of HCCs.

- tumor suppressor genes: loss of function mutation in TP53, present in up to 60% of HCCs.

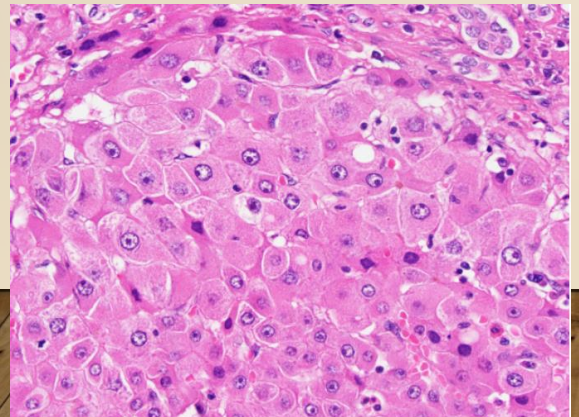
- HCC often appears to arise from premalignant precursors lesions: contains all features of malignancy except invasion
- Hepatic adenoma.
- Chronic liver disease associated with cellular dysplasias :

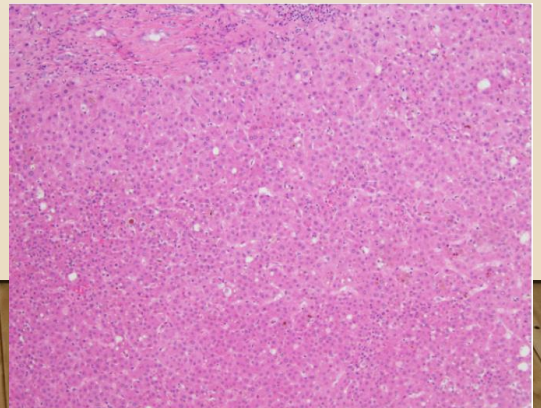
➢ large-cell change.: nuclear feature of malignancy means the increase of the N:C ratio, in the large cell change the nucleus and cytoplasm size increases so the ratio remains normal

❖ increase in both nuclear and cytoplasmic size, preserving nuclear to cytoplasmic ratio; nuclei are hyperchromatic, pleomorphic and frequently multinucleated.

➢ small-cell change:

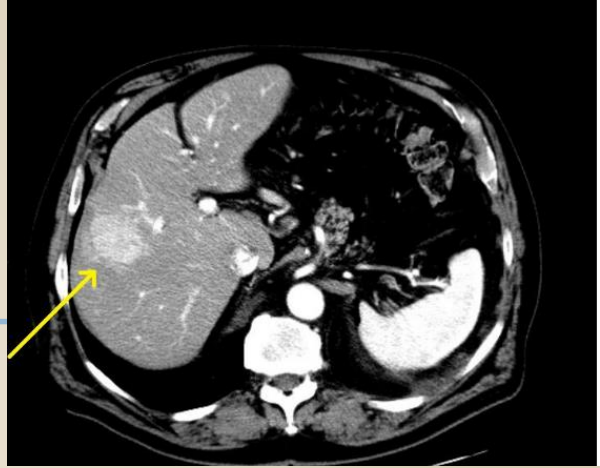
❖ decreased cell volume, increased nuclear to cytoplasmic ratio, mild nuclear pleomorphism, hyperchromasia and cytoplasmic basophilia, giving the impression of nuclear crowding





dark color

CLINICAL FEATURES



- ill-defined upper-abdominal pain, malaise, fatigue, weight loss.
- abdominal mass or abdominal fullness.
- Jaundice,, gastrointestinal or esophageal variceal bleeding.
- Metastatic : most commonly to the lungs.

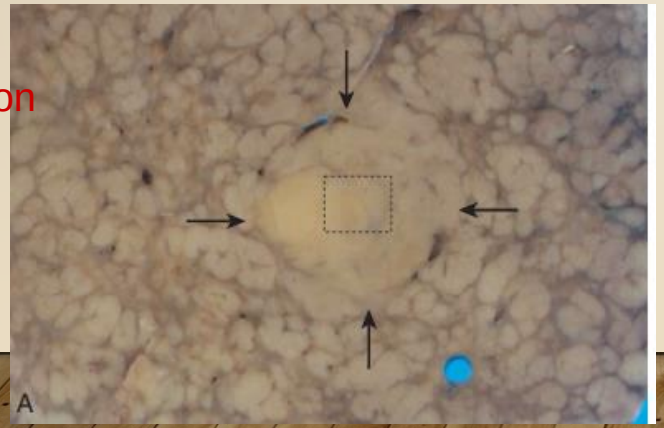
- Laboratory studies: Elevated serum levels of α-fetoprotein.
- imaging studies: Increasing arterialization during the development and progression of HCC .
- Death usually occurs from:
- (1) cachexia, wasting of the body due to chemical mediators
- (2) gastrointestinal or esophageal variceal bleeding
- (3) liver failure with hepatic coma. hepatic coma is caused by elevated levels of ammonia
- (4) rupture of the tumor with fatal hemorrhage

MORPHOLOGY

- HCC may appear grossly as:
- (1) a unifocal (usually large) mass.
- (2) multifocal, widely distributed nodules of variable size.
- (3) a diffusely infiltrative cancer,

depends when the patient gets diagnosed at the beginning its usually unifocal and could develop by metz

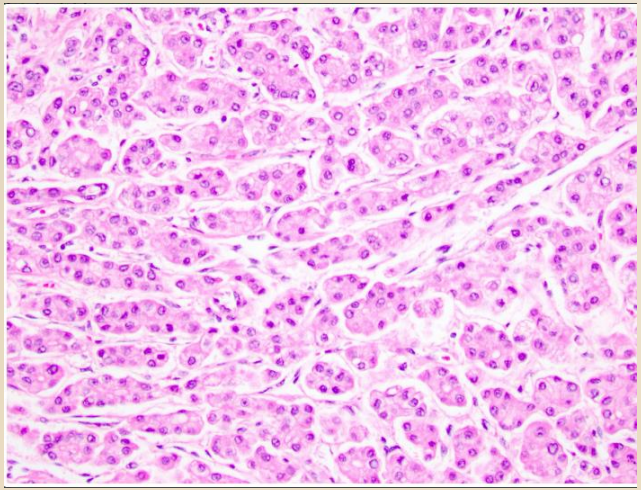
unifocal
single lesion

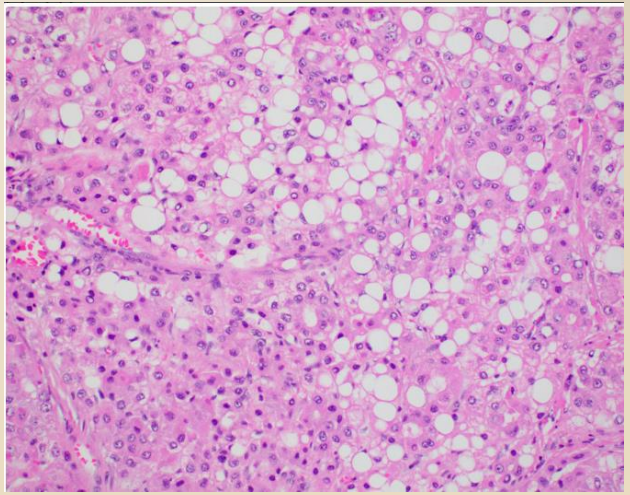


multifocal

- HCCs range from :
- well differentiated to highly anaplastic lesions.

to know what's the origin of the poorly differentiated cells we use the "immune stain"





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

tumor cells appear malignant on H&E and often cannot be distinguished from other poorly differentiated neoplasms;

malignant tumor in epithelium

CHOLANGIOCARCINOMA

- The second most common primary malignant tumor of the liver after HCC.
- arises from intrahepatic and extrahepatic bile ducts.
- All risk factors for cholangiocarcinoma cause chronic inflammation and cholestasis, which presumably promote occurrence of somatic mutations or epigenetic alterations in cholangiocytes.

- The risk factors include :

✓ infestation by liver flukes .

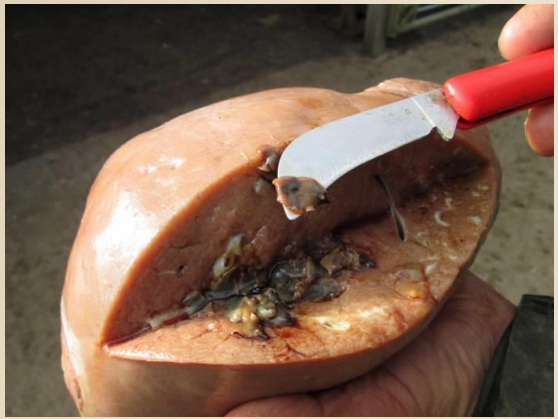
shows onion skin fibrosis under microscope

✓ chronic inflammatory disease of the large bile ducts (such as primary sclerosing cholangitis),

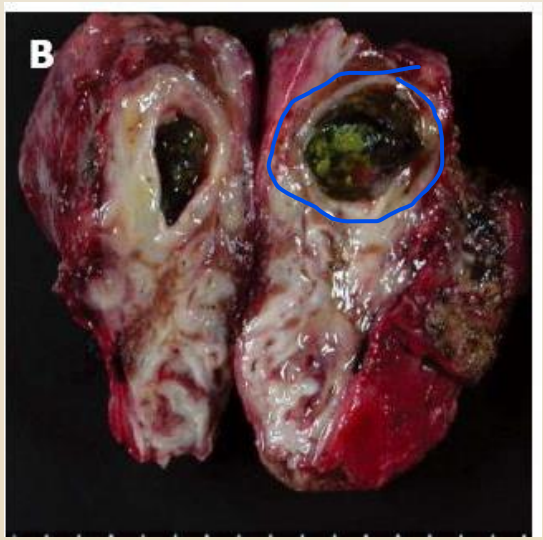
✓ hepatolithiasis.

✓ fibropolycystic liver disease.

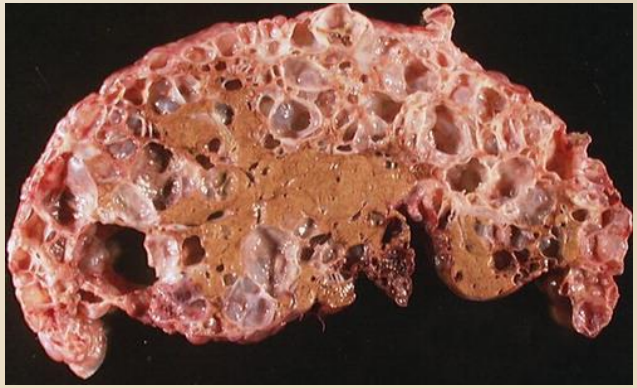
liver flukes (worms)



hepatolithiasis (stones)

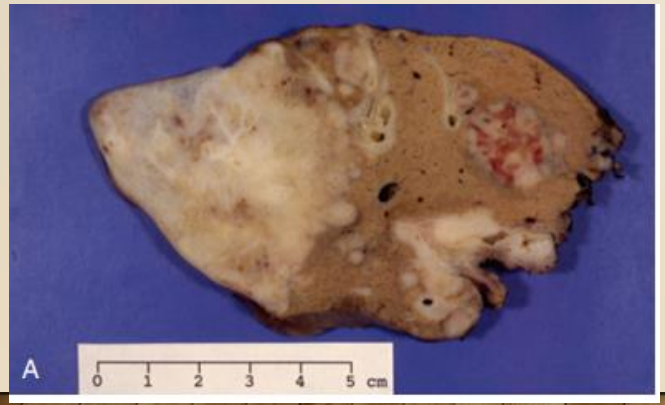


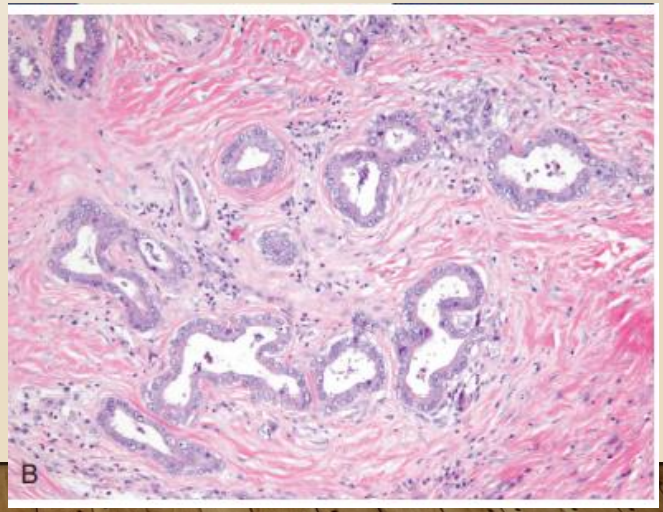
fibro polycystic liver disease shows multiple cysts



MORPHOLOGY

- Most tumors appear as firm, gray nodules within the bile duct wall.
- Cholangiocarcinomas are typical mucin-producing adenocarcinomas. Most are well to moderately differentiated, growing as glandular/tubular structures lined by malignant epithelial cells.





GALLBLADDER

strawberry like mucosa

the epithelium is located on the surface of mucosa, in all epithelium covered organs if the gland is found downwards we usually understand that its invasive but the gallbladder is the only exception. In the wall of the gallbladder there is a normal histological glandular variant lined by epithelium called rokitansky aschoff and is not invasive

GALLBLADDER

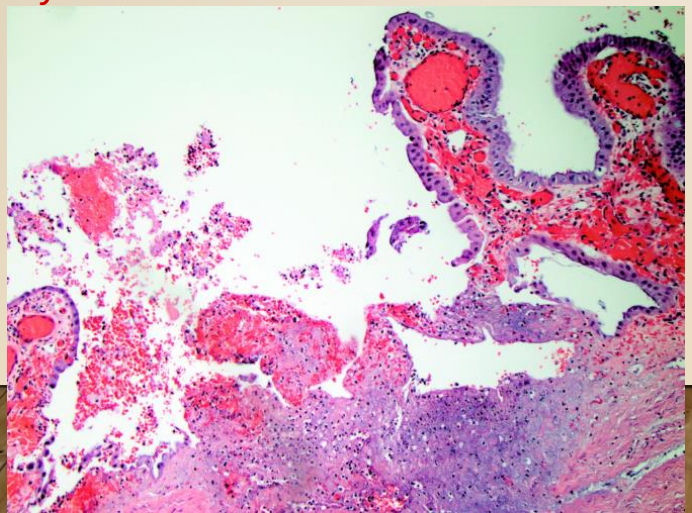
- GALLSTONE DISEASE.
- CHOLECYSTITIS:

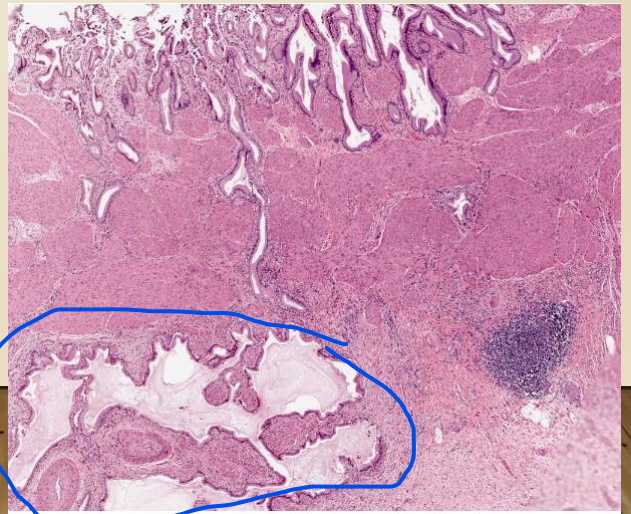
➢ Acute Calculous Cholecystitis: Acute inflammation of a gallbladder that contains stones.

neutrophils, edema hemorrahge and fibrin

➢ Chronic Cholecystitis: occur due to repeated bouts of acute cholecystitis or de novo.

leukocytes and fibrosis



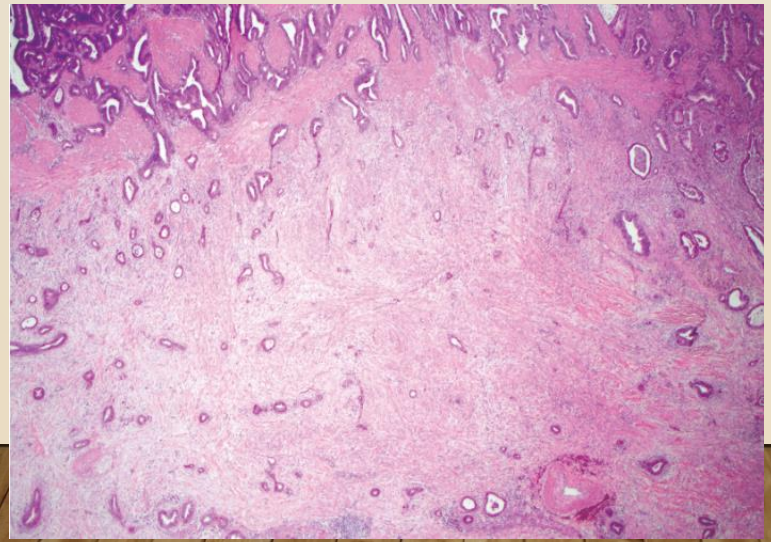


carcinoma tumors are always found on the surface and are invasive
not all glandular components in the wall are considered invasive

CARCINOMA OF THE GALLBLADDER:

- more common in women and occurs most frequently in the seventh decade of life.
- Presenting symptoms : abdominal pain, jaundice, anorexia, nausea and vomiting.
- Most carcinomas of the gallbladder are adenocarcinomas.

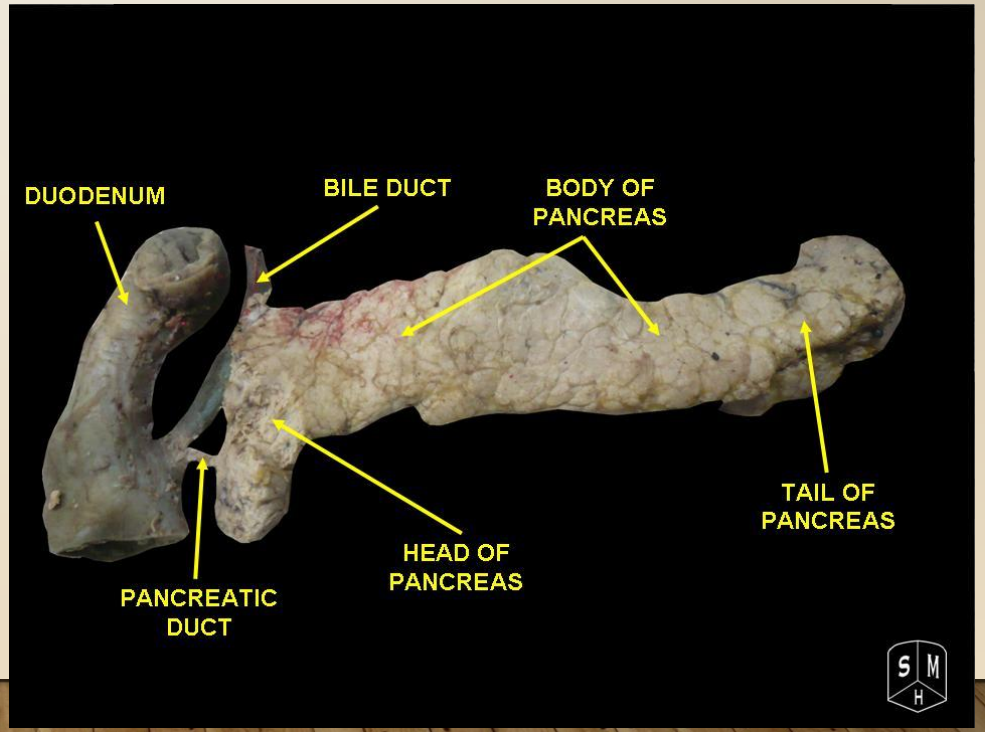
the difference between invasive
and non-invasive is the lining
if it was a normal/active/unremarkable rokitansky aschoff
the lining should be normal (just like the surface)



if the surface is hyperchromatic, pleomorphic and there is an increase in the n:c ratio with the fnding of components in the surface and invasive

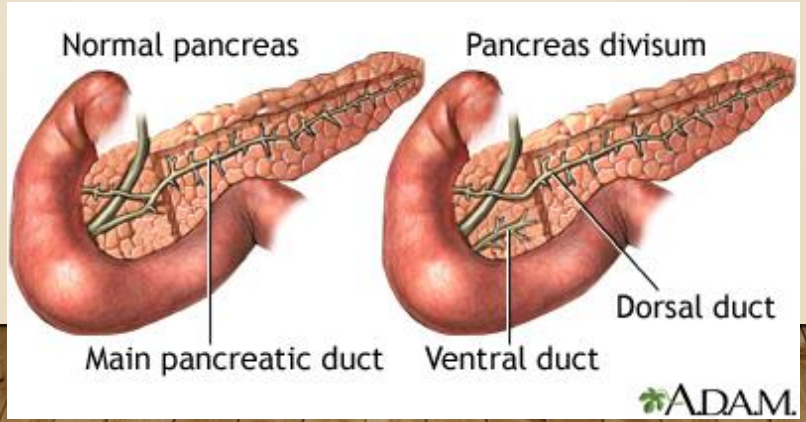
PANCREAS

- Congenital Anomalies.
- Pancreatitis.
- Pancreatic Cystic Neoplasms:
  - Pancreatic Carcinoma

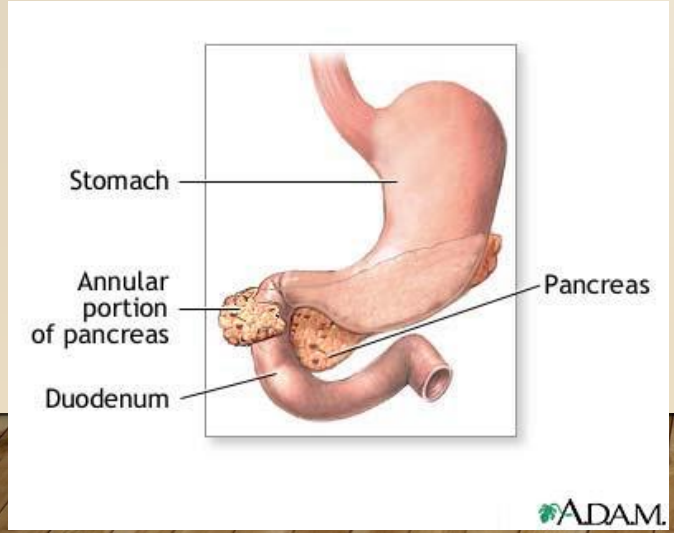


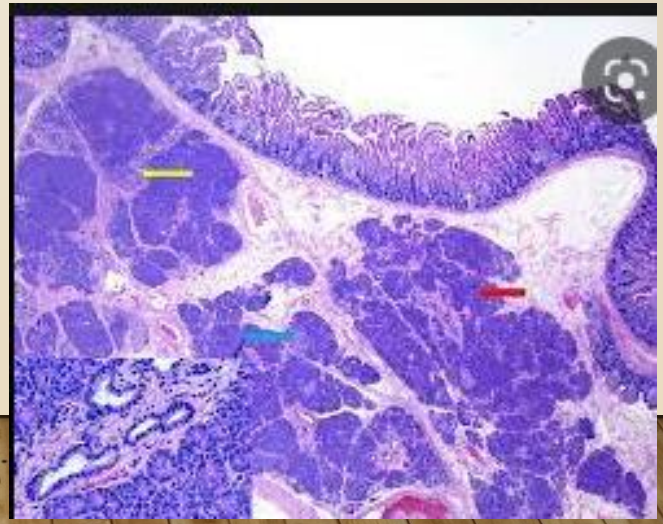
CONGENITAL ANOMALIES

- 1. Agenesis: the pancreas is totally absent. rare
- 2. Pancreas Divisum:
- most common congenital anomaly of the pancreas.
- caused by a failure of fusion of the fetal duct systems of the dorsal and ventral pancreatic primordia.



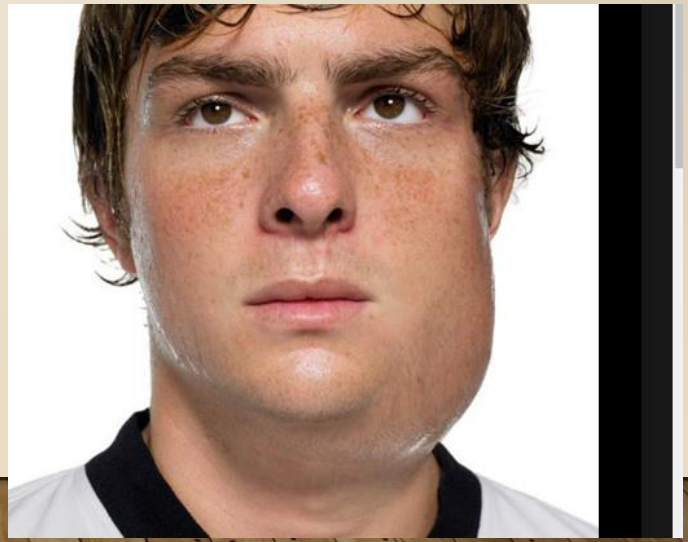
- 3. Annular Pancreas: ring of pancreatic tissue completely encircles the duodenum.
- 4. Ectopic Pancreas: favored sites are the stomach and duodenum, followed by the jejunum, Meckel diverticulum, and ileum.





PANCREATITIS:ACUTE PANCREATITIS

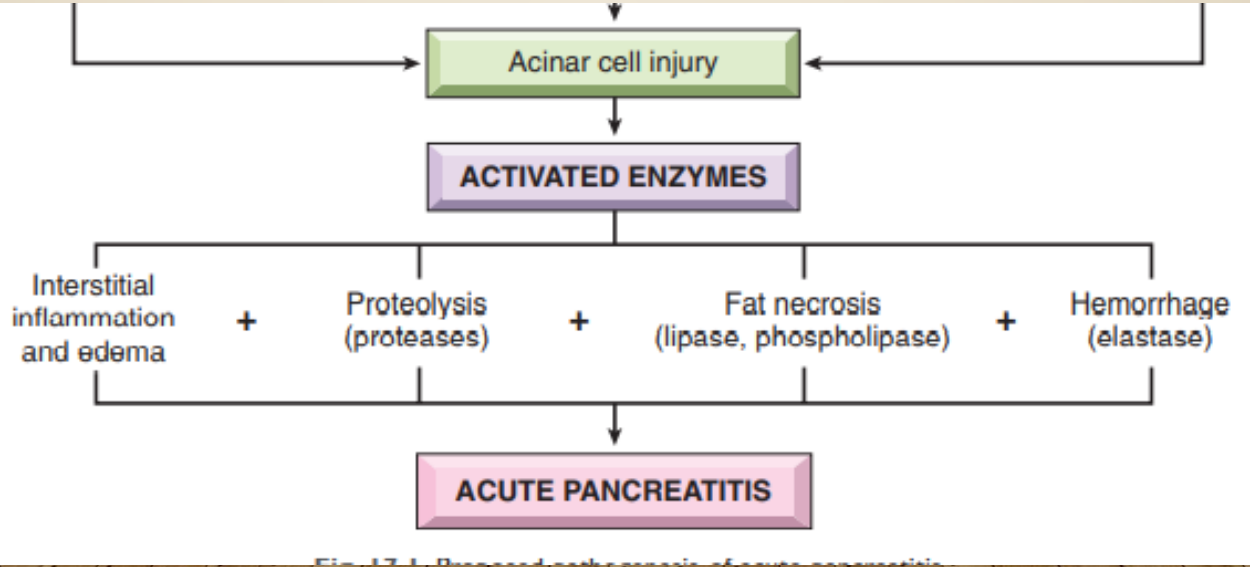
- Acute pancreatitis is a reversible inflammatory disorder that varies in severity, from focal edema and fat necrosis to widespread hemorrhagic necrosis.
- Etiology:
  - Gallstones.
  - Non–gallstone-related obstruction. like tumors
  - Medications.
  - Infections.
  - Metabolic disorders



PATHOGENESIS

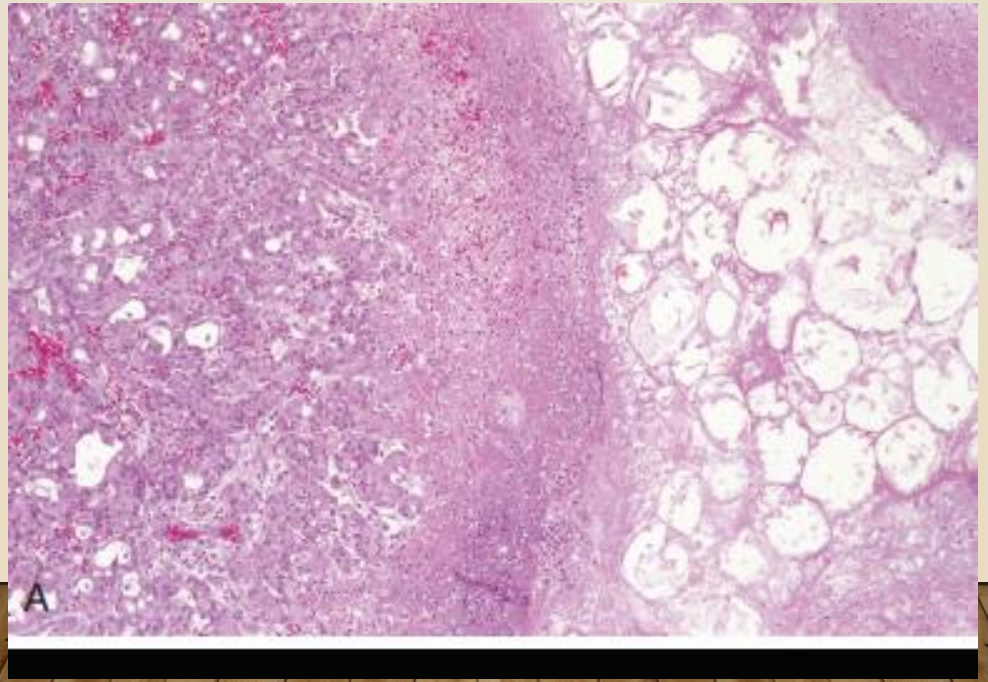
the pancrease contains lots of digestive enzymes which are found in the acinar cell, if injury occurs to these cells the enzymes will reach the parenchyma so autodigestion happens

- Acute pancreatitis appears to be caused by autodigestion of the pancreas by inappropriately activated pancreatic enzymes.



MORPHOLOGY

- acute inflammatory cell infiltrate admixed with edema and fibrinous exudate.
- patchy necrosis.



CHRONIC PANCREATITIS

- Chronic pancreatitis is characterized by long-standing inflammation that leads to irreversible destruction of the exocrine pancreas, followed eventually by loss of the islets of Langerhans.
- Etiology:

➢ long-term alcohol abuse.

➢ Duct Obstruction

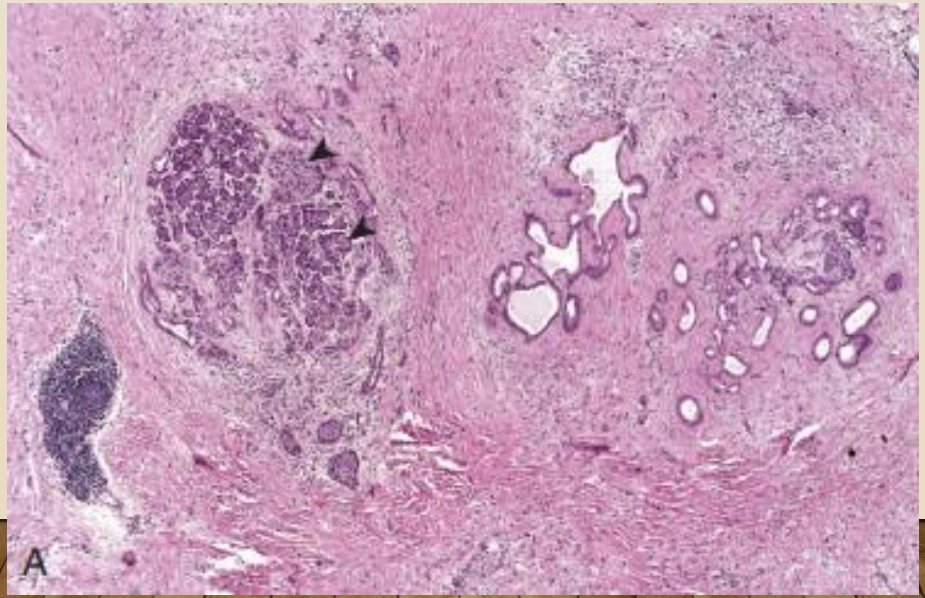
➢ Hereditary pancreatitis

➢ Autoimmune pancreatitis.

MORPHOLOGY

- Chronic pancreatitis is characterized by parenchymal fibrosis, reduced number and size of acini, and variable dilation of the pancreatic ducts

fibrosis causes a drop in numbers of acini glands

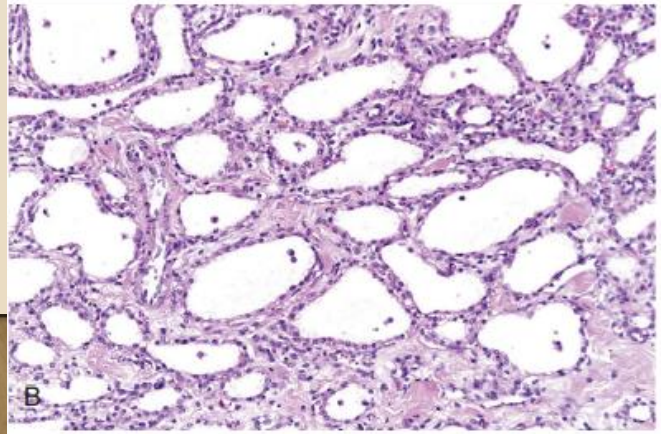


PANCREATIC NEOPLASMS: CYSTIC NEOPLASMS

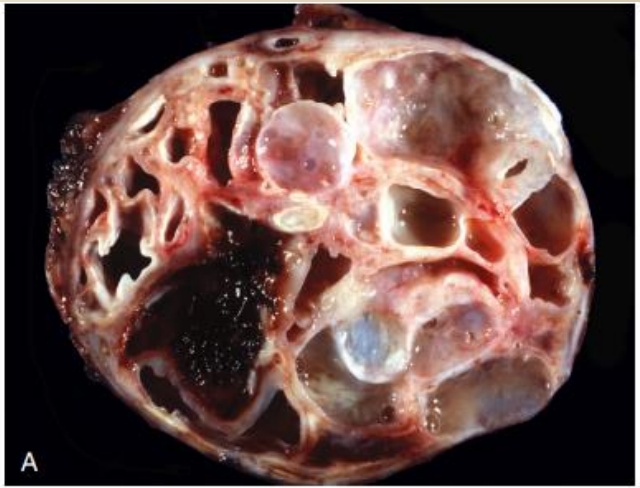
- 1. Serous cystadenomas :
- composed of glycogen-rich cuboidal cells

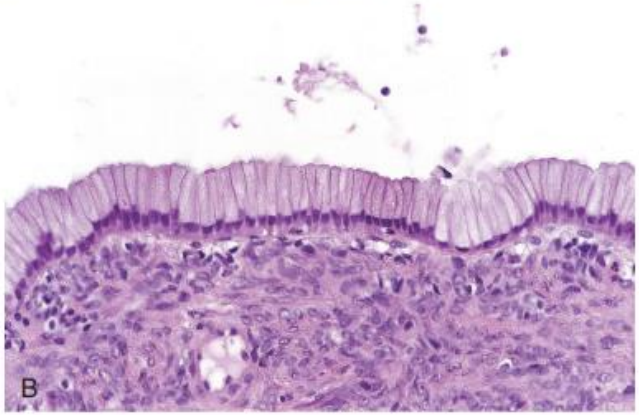
surrounding small cysts containing clear, straw colored fluid.

since it's clear it can't be seen grossly



2. mucinous cystic neoplasm:
the cysts are lined by a columnar mucinous epithelium with an associated densely cellular stroma resembling that of the ovary.





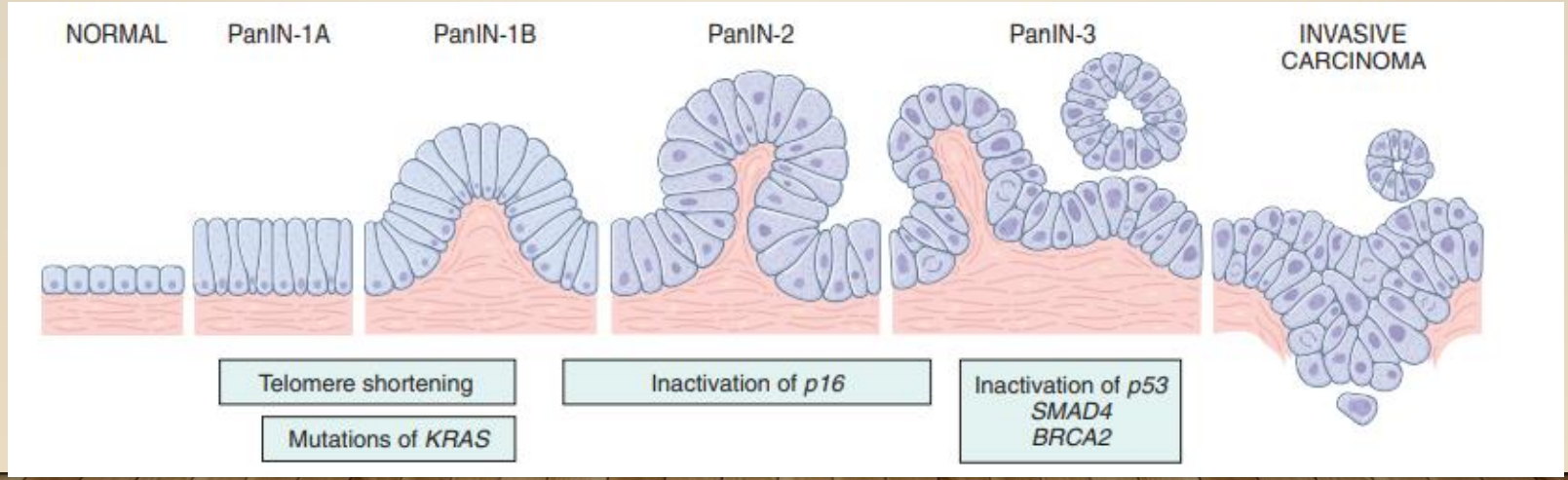
very very important!

PANCREATIC CARCINOMA solid carcinoma

- pancreatic cancer arises as a consequence of inherited and acquired mutations in cancer-associated genes.

panIN-A -> telomere shortening and mutations of KRAS / panIN-B -> over lapping with panIN-A and 2 / panIN-2 -> inactivation of p16

panIN-3 -> inactivation of p53 smad4 brca2



MORPHOLOGY

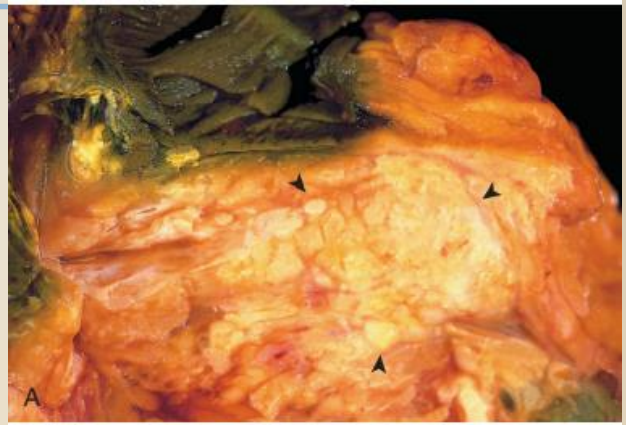
- Carcinomas of the pancreas usually are hard, gray-white, stellate, poorly defined masses.
- On microscopic examination,:
- pancreatic carcinoma usually

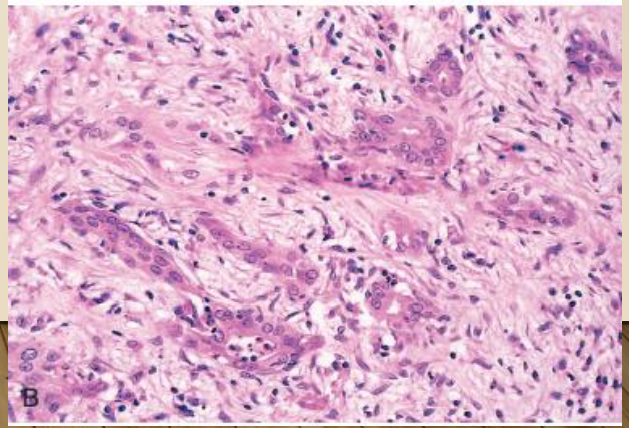
is a moderately to poorly differentiated adenocarcinoma

forming abortive glands with mucin secretion

or cell clusters and exhibiting an aggressive,

deeply infiltrative growth pattern





CLINICAL FEATURES

- Carcinomas of the pancreas typically remain silent until their extension impinges on some other structure.
- Pain. due to compression of a nerve
- Obstructive jaundice. compression of biliary system
- Weight loss, anorexia, and generalized malaise and weakness are manifestations of advanced disease