

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
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graph LR; A[❑ true neoplasms] --- B[Benign Neoplasms]; A --- C[Malignant Neoplasms]
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- Benign Neoplasms
  - Malignant Neoplasms

# FOCAL NODULAR HYPERPLASIA (FNH)

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- 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.

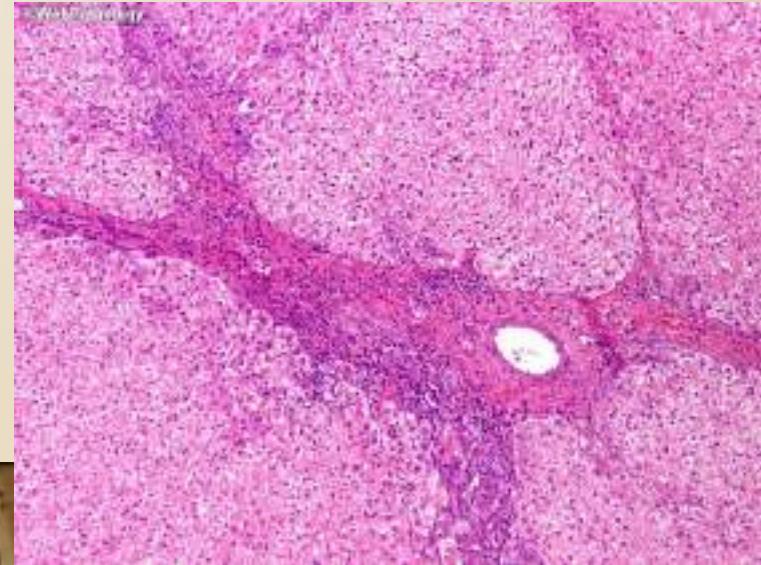
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- well-demarcated, poorly encapsulated nodule in an otherwise normal liver.
- there is a central gray-white, depressed stellate scar from which fibrous septa radiate to the periphery.



# 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

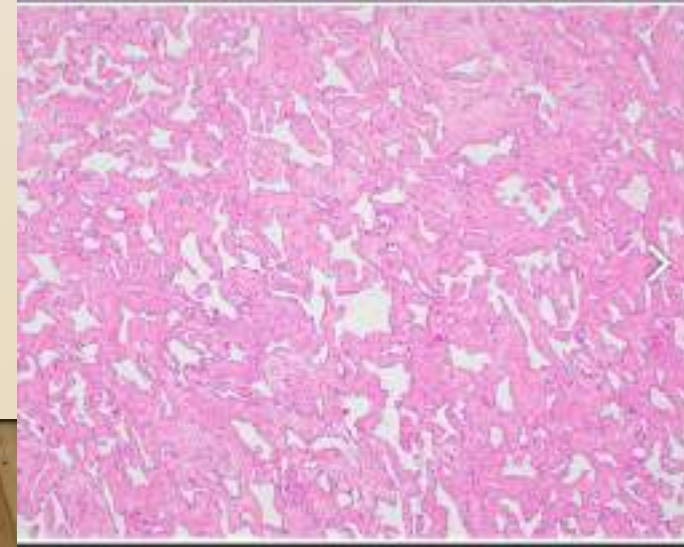
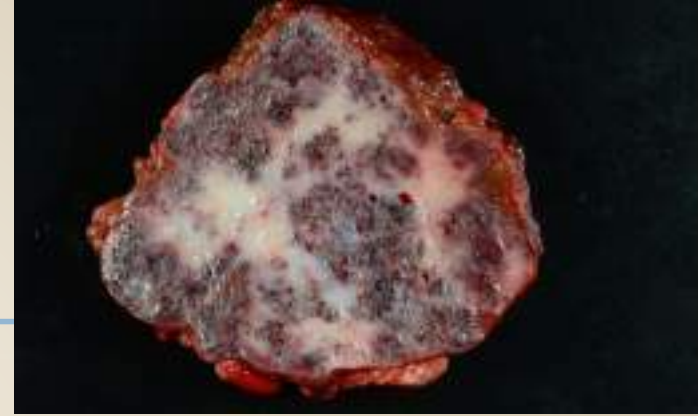




# BENIGN NEOPLASMS

## ❖ I. 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



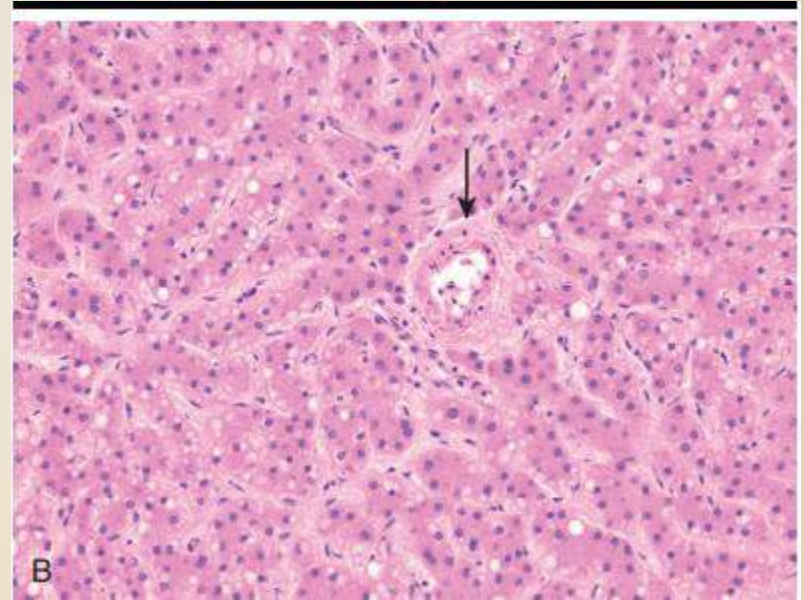
## 2. HEPATOCELLULAR ADENOMAS

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- 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.



- solitary well circumscribed uncapsulated lesion.



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



# MALIGNANT NEOPLASMS

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

# HEPATOCELLULAR CARCINOMA (HCC)

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- 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 hepatitis (HBV and HCV).
    - ✓ heavy alcohol consumption.
    - ✓ Metabolic syndrome: obesity, diabetes mellitus, and NAFLD .
    - ✓ toxic injuries (aflatoxin, it synergizes with HBV (and perhaps also with HCV) to increase risk further)..
    - ✓ Inherited disorders, particularly hereditary hemochromatosis and  $\alpha$ 1AT deficiency, and to a lesser degree Wilson disease

# PATHOGENESIS

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- HCC is induced by acquired driver mutations in :
  - 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:
- Hepatic adenoma.
- Chronic liver disease associated with cellular dysplasias :

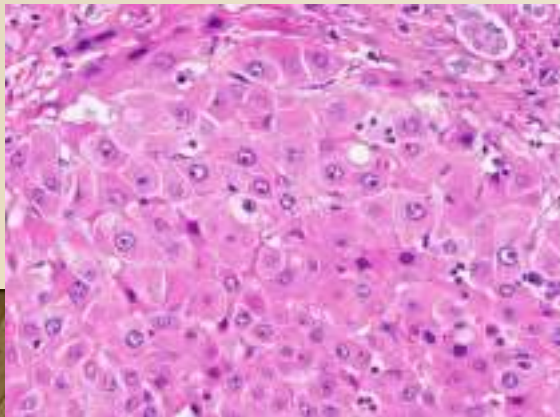
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➤ large-cell change.:

❖ 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





# CLINICAL FEATURES

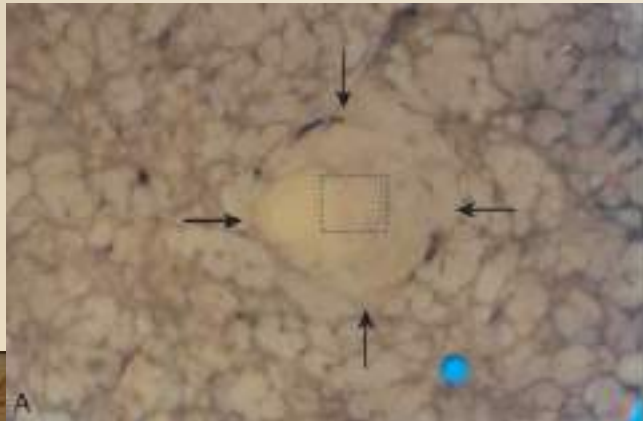
- ill-defined upper-abdominal pain, malaise, fatigue, weight loss.
- abdominal mass or abdominal fullness.
- Jaundice,, gastrointestinal or esophageal variceal bleeding.
- Metastatic : most commonly to the lungs.
- ❖ Laboratory studies: Elevated serum levels of  $\alpha$ -fetoprotein.
- ❖ imaging studies: Increasing arterialization during the development and progression of HCC .
- ❖ Death usually occurs from:
  - ❖ (1) cachexia,
  - ❖ (2) gastrointestinal or esophageal variceal bleeding
  - ❖ (3) liver failure with hepatic coma.
  - ❖ (4) rupture of the tumor with fatal hemorrhage



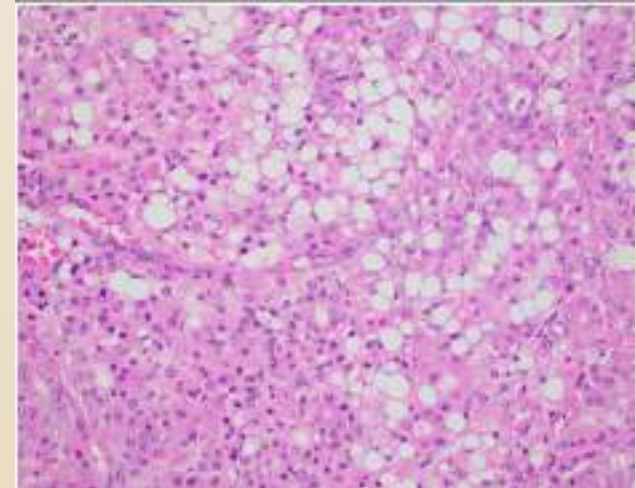
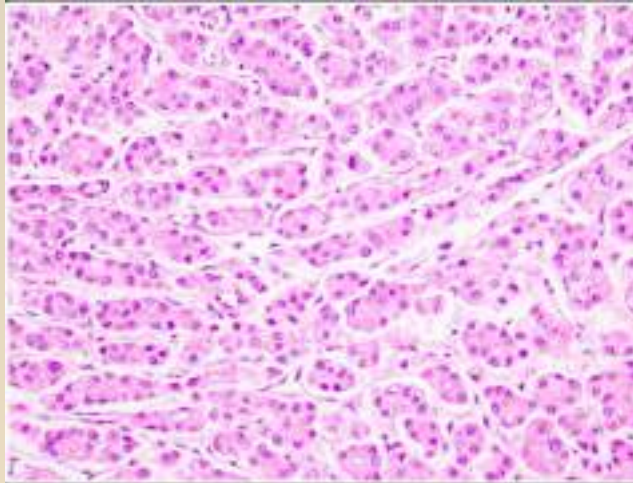
# MORPHOLOGY

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



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



**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;**

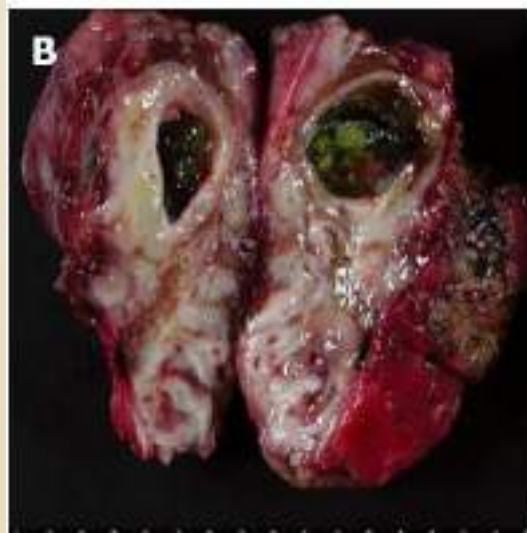
# CHOLANGIOCARCINOMA

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- 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 .
  - ✓ chronic inflammatory disease of the large bile ducts (such as primary sclerosing cholangitis),
  - ✓ hepatolithiasis.
  - ✓ fibropolycystic liver disease.

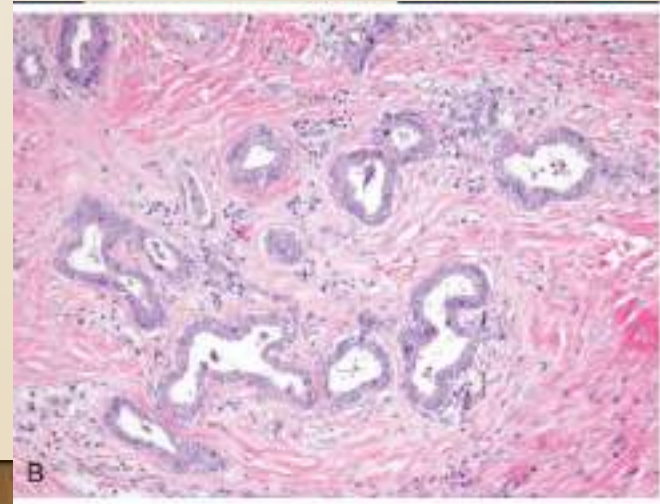




# MORPHOLOGY

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- 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

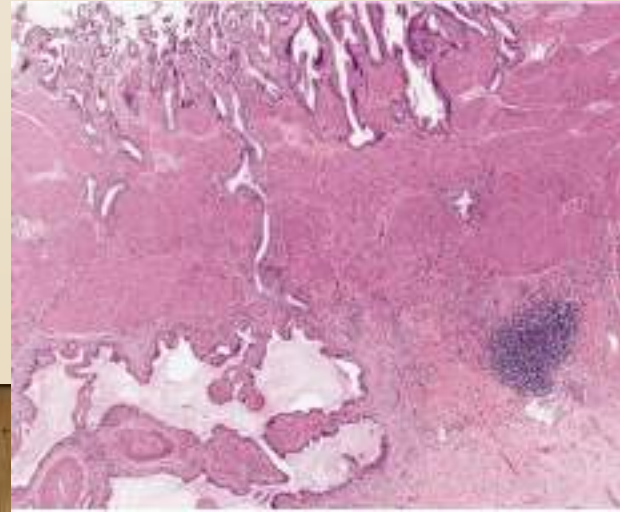
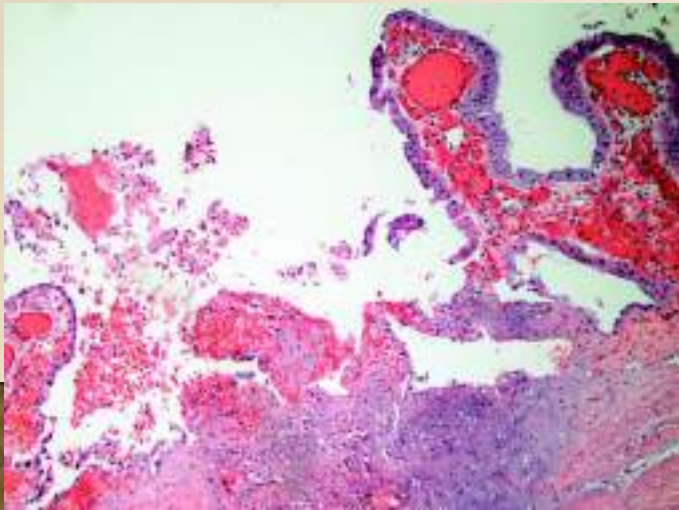
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# GALLBLADDER

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- GALLSTONE DISEASE.
- CHOLECYSTITIS:
  - Acute Calculous Cholecystitis: Acute inflammation of a gallbladder that contains stones.
  - Chronic Cholecystitis: occur due to repeated bouts of acute cholecystitis or de novo.

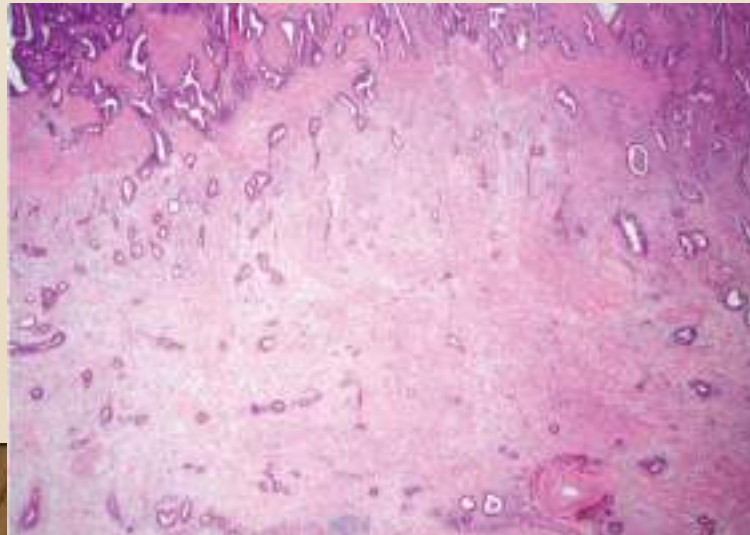




# CARCINOMA OF THE GALLBLADDER:

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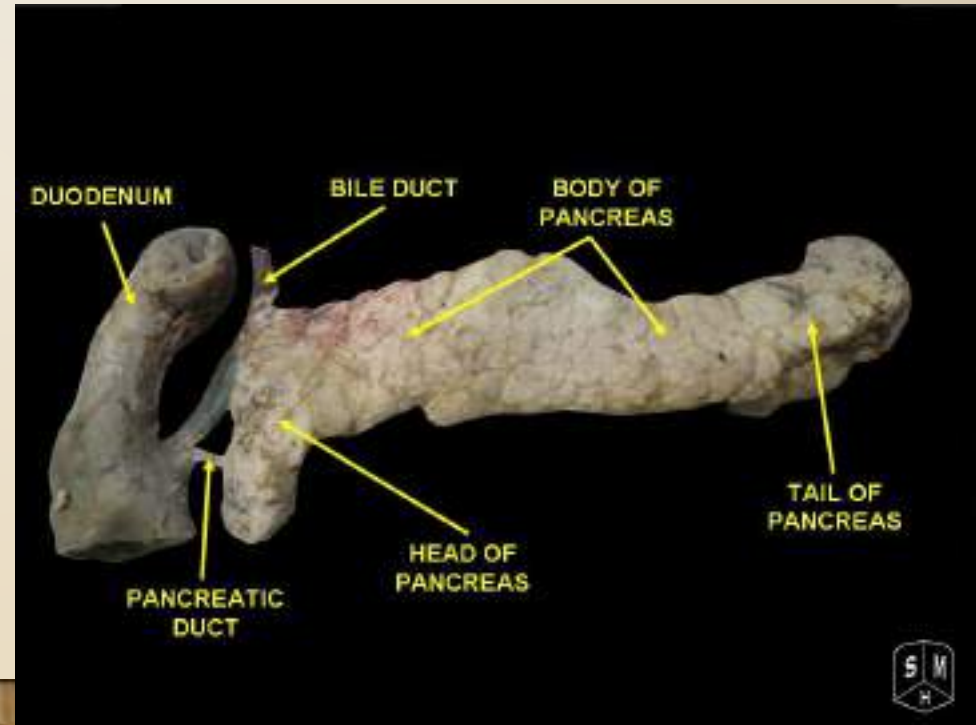
- more common in women and occurs most frequently in the seventh decade of life.
- Presenting symptoms : abdominal pain, jaundice, anorexia, nausea and vomiting.
- Most carcinomas of the gallbladder are adenocarcinomas.



# PANCREAS

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

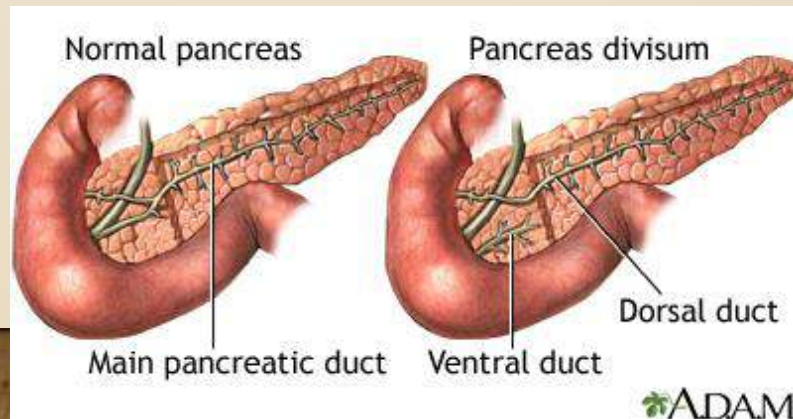




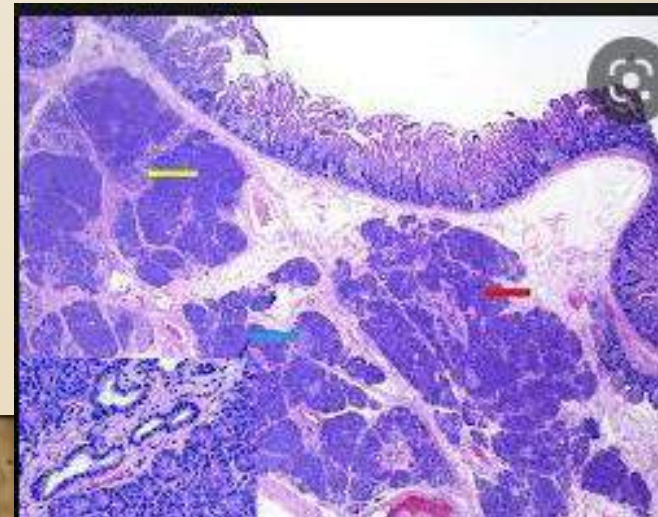
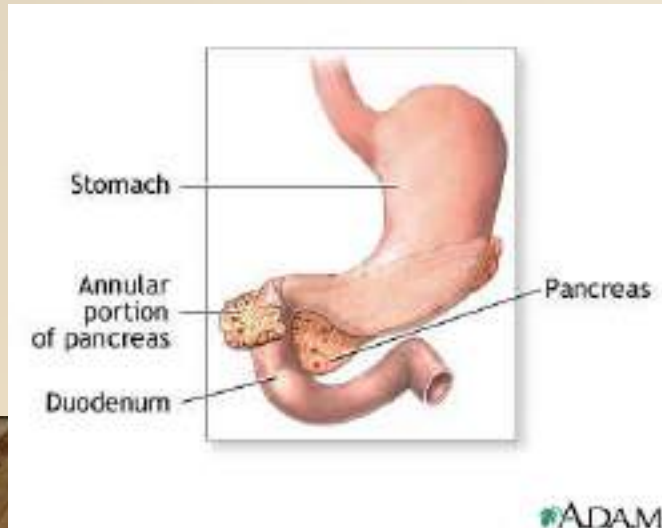
# CONGENITAL ANOMALIES

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- 1. Agenesis: the pancreas is totally absent.
- 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

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- 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.
  - Medications.
  - Infections.
  - Metabolic disorders



# PATHOGENESIS

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

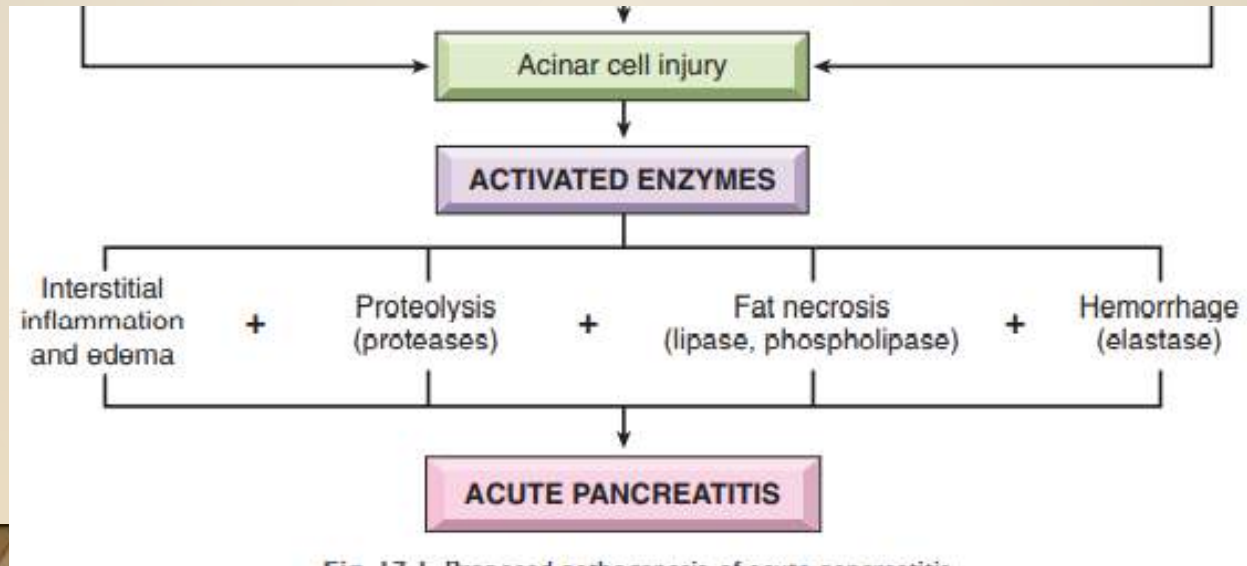


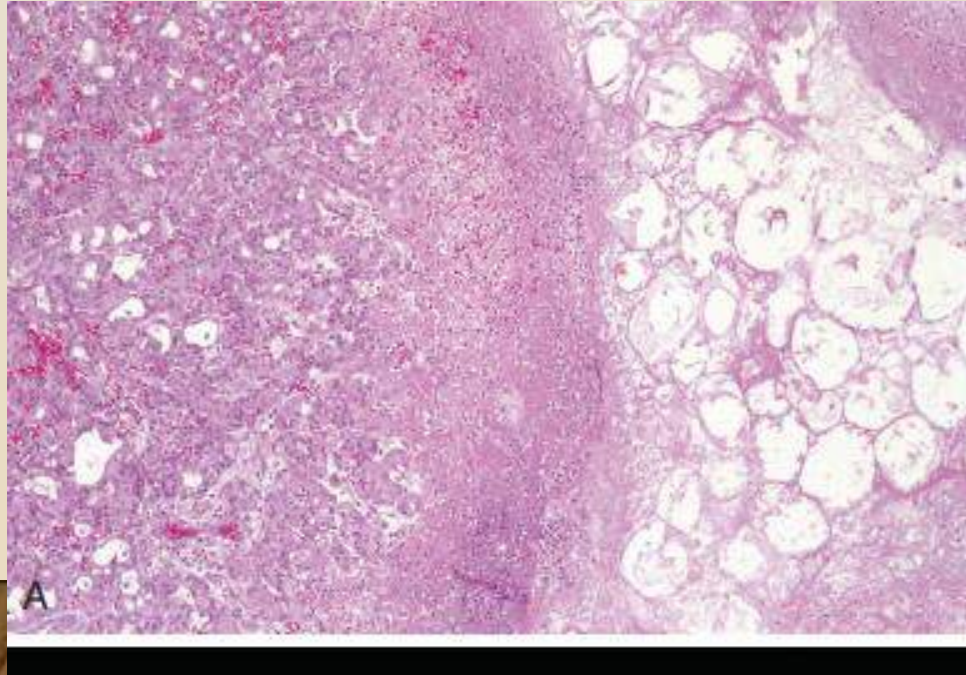
Fig. 17.1 Proposed pathogenesis of acute pancreatitis.



# MORPHOLOGY

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



# CHRONIC PANCREATITIS

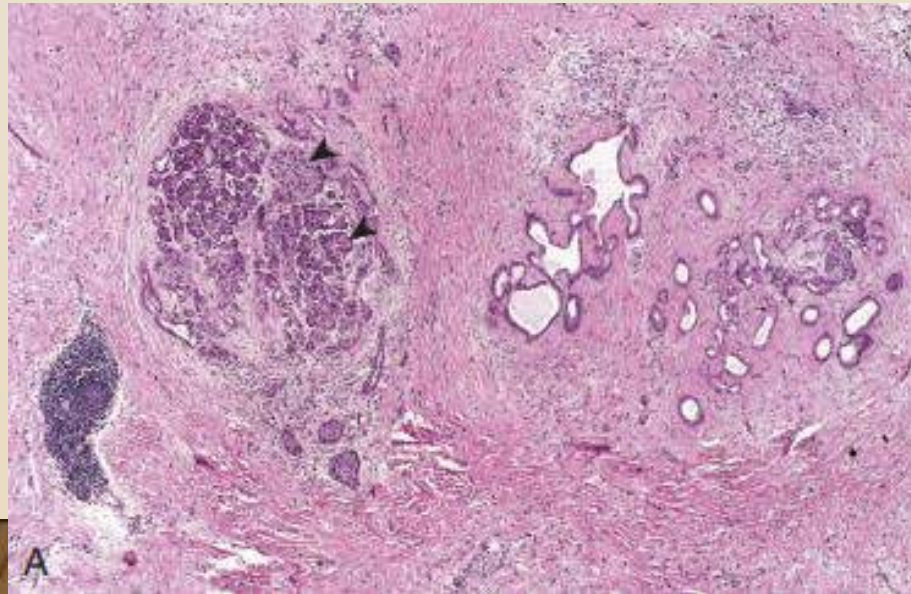
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- Chronic pancreatitis is characterized by long-standing inflammation that leads to irreversible destruction of the exocrine pancreas, followed eventually by loss of the islets of Langerhans.
- Etiology:
  - long-term alcohol abuse.
  - Duct Obstruction
  - Hereditary pancreatitis
  - Autoimmune pancreatitis.

# MORPHOLOGY

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

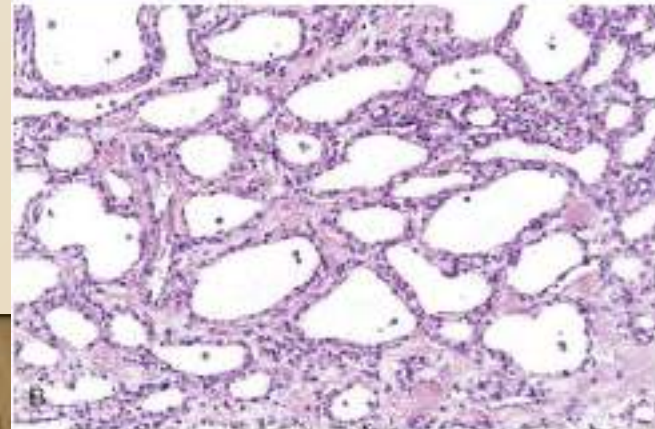




# PANCREATIC NEOPLASMS: CYSTIC NEOPLASMS

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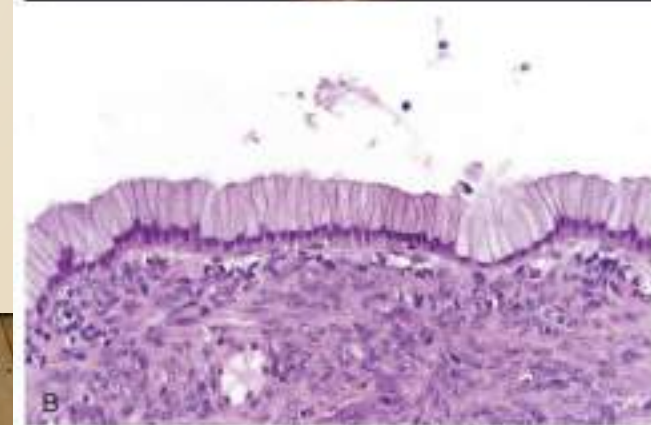
- I. Serous cystadenomas :
- composed of glycogen-rich cuboidal cells surrounding small cysts containing clear, straw colored fluid.





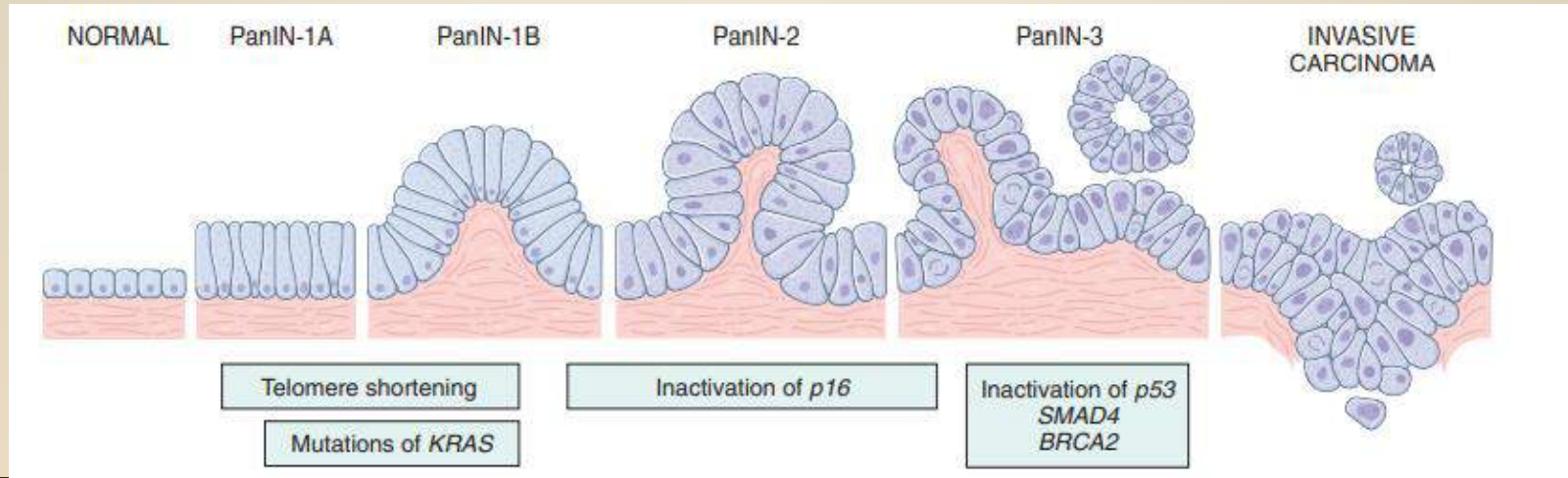
## 2. mucinous cystic neoplasm:

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



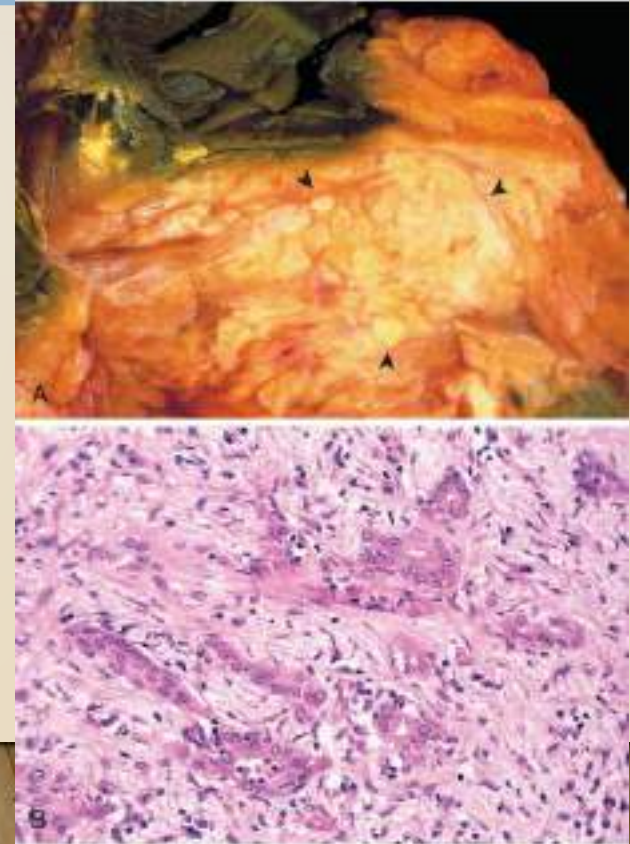
# PANCREATIC CARCINOMA

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



# 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

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