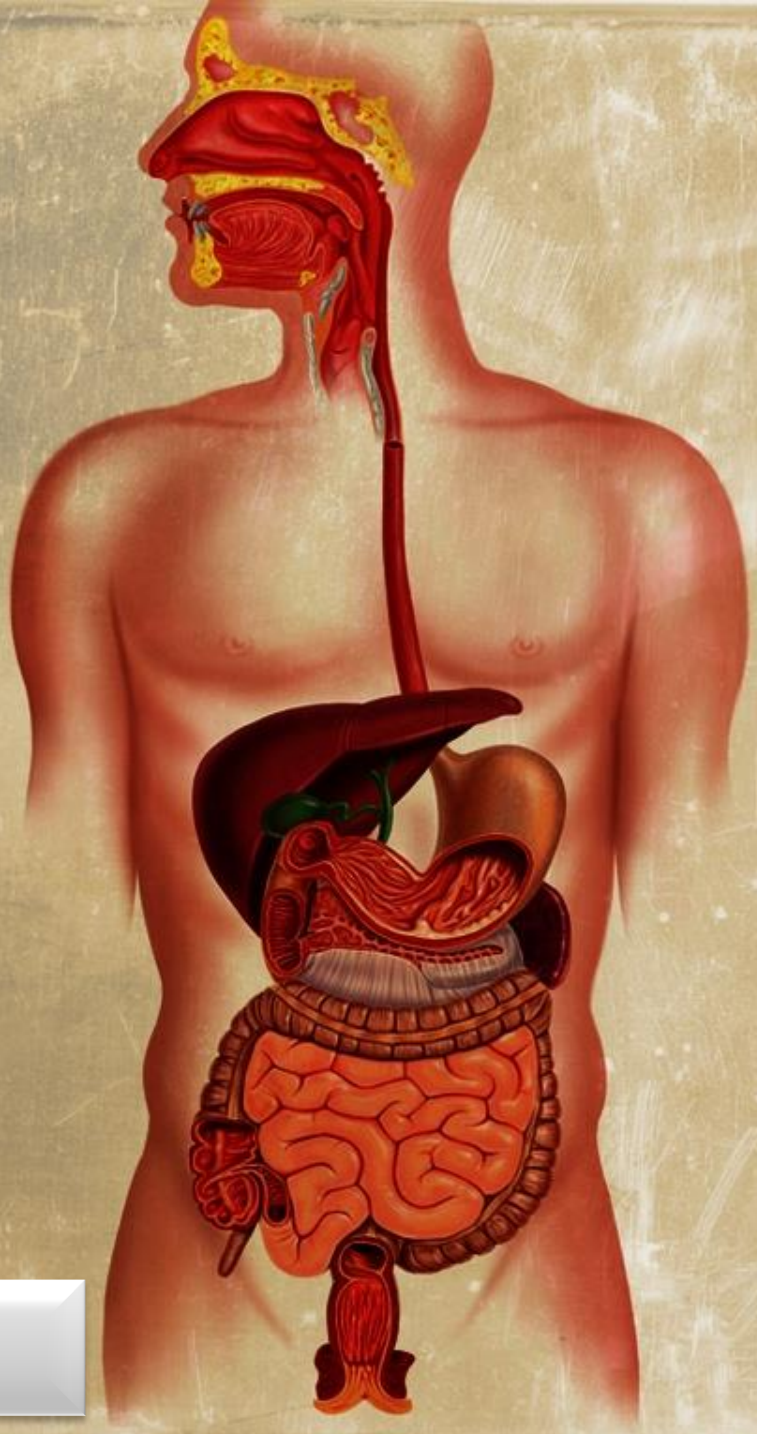
Lecture 3:

pancreatitis



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Objectives

- Recognize the predisposing factors of pancreatitis.
- Describe the different types of pancreatitis.
- Understand the pathogenesis of acute and chronic pancreatitis

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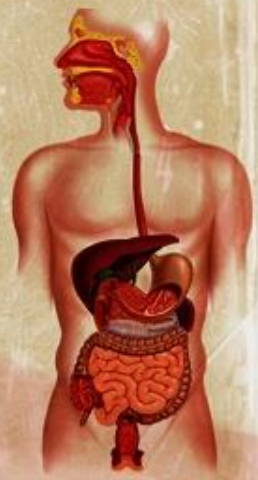


Pancreatitis

Definition : Inflammation of the pancreas.

-The clinical manifestations can range in severity from a mild, self-limited disease to a life threatening acute inflammatory process.

-The duration of the disease can range from a transient attack (reversible) to an irreversible loss of function.

- It could be acute or chronic .

Acute pancreatitis

Definition : a group of reversible lesions characterized by inflammation of the pancreas.

Table 16–1 Etiologic Factors in Acute Pancreatitis

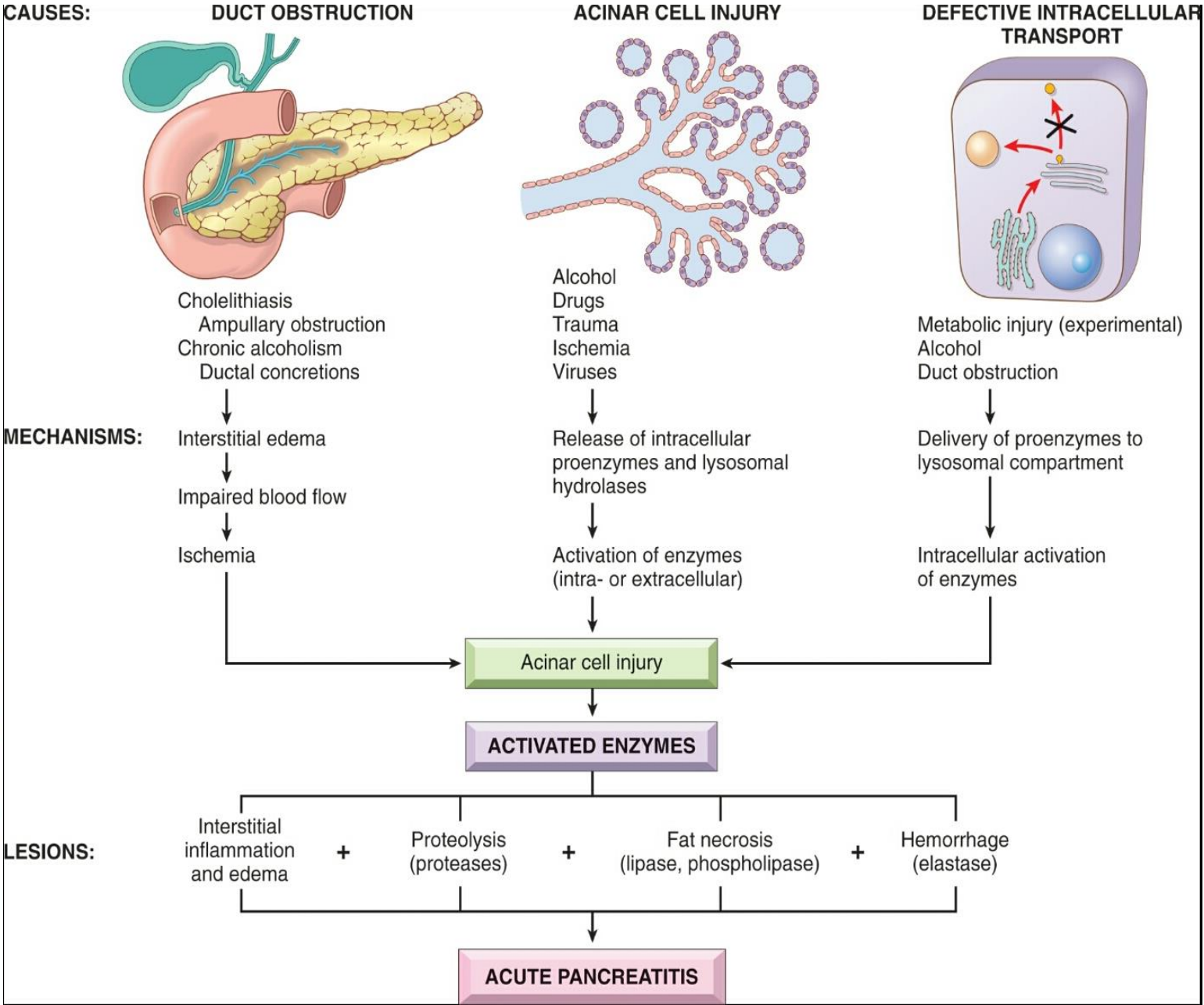
Metabolic
Alcoholism* ←
Hyperlipoproteinemia
Hypercalcemia
Drugs (e.g., azathioprine)
Genetic
Mutations in the cationic trypsinogen (*PRSS1*) and trypsin inhibitor (*SPINK1*) genes
Mechanical
Gallstones* ←
Trauma
Iatrogenic injury
Perioperative injury
Endoscopic procedures with dye injection
Vascular
Shock
Atheroembolism
Polyarteritis nodosa
Infectious
Mumps
Coxsackievirus

*Most common causes in the United States.

N.B: the smaller gallstone is the more dangerous to cause pancreatitis

Pathogenesis :

Auto digestion of pancreatic substance by inappropriate activated pancreatic enzymes.



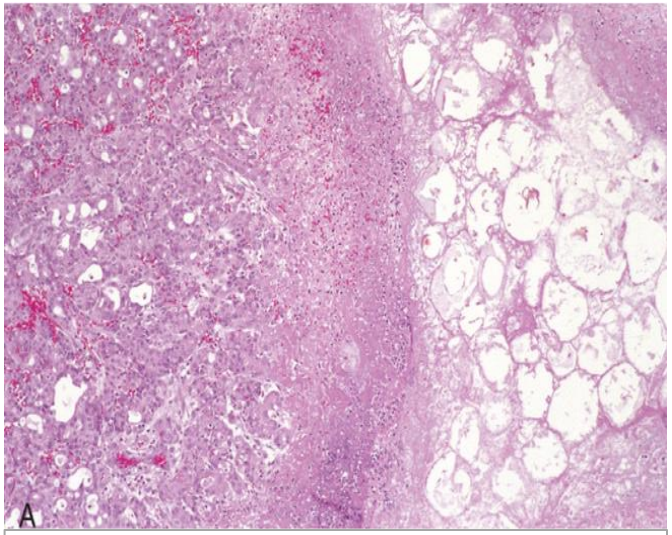
Morphology :

The morphology of acute pancreatitis ranges from inflammation and edema to severe extensive necrosis and haemorrhage .

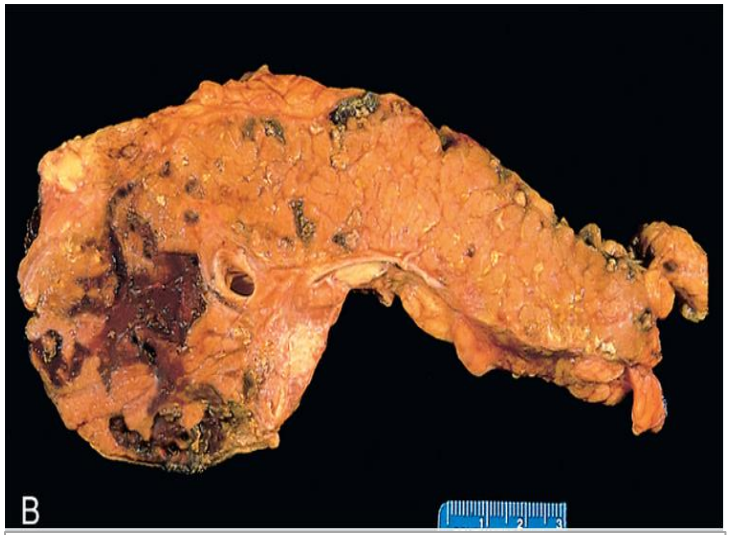
- **The basic alterations are :**

1. Microvascular leakage causing edema .
2. Necrosis of fat (by lipases which destructs fat cells).
3. An acute inflammatory reaction .
4. Proteolytic destruction of pancreatic parenchyma.
5. Destruction of blood vessels with subsequent interstitial hemorrhage .

- The alteration depend on the Etiology. fat necrosis is the most common.
- The released fatty acids combine with calcium to form insoluble salts that precipitate.



Region of fat necrosis (right) and focal pancreatic parenchymal necrosis (center).



Dark areas of hemorrhage in the pancreatic substance and a focal area of pale fat necrosis in the peripancreatic fat (upper left).

Clinical Features :

- Abdominal pain (Major symptoms).
- Full-blown acute pancreatitis is a medical emergency, usually have the sudden onset of an "acute abdomen", The pain is constant and intense and is often referred to the upper back.

Laboratory findings :

- elevation of serum amylase levels during the first 24 hours(earlier)
- rising serum lipase level within 72 to 96 hours (more specific) .

Management and Prognosis :

The key to the management is "resting" the pancreas by total restriction of food and fluids and by supportive therapy. Nothing by mouth "NBM or NPO = nill per os"

- Most patients recover fully.
- About 5% die from shock during the first week of illness.
- Acute respiratory distress syndrome and acute renal failure are fatal complications.

- In surviving patients, sequelae* include:

I. Sterile pancreatic abscess
II. Pancreatic pseudocyst.

*A chronic condition that is a complication of an acute condition that begins during that acute condition.

Chronic pancreatitis

Definition : inflammation of the pancreas with destruction of exocrine parenchyma, fibrosis, and irreversible impairment in pancreatic function .

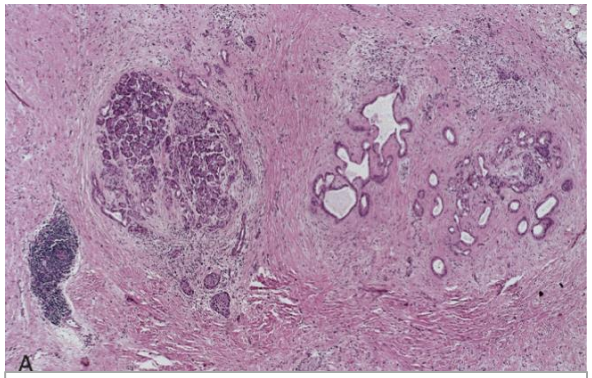
- in the **late stages**, also destruction of endocrine parenchyma .

Causes : Similar to the acute form, patients are usually middle-aged males .

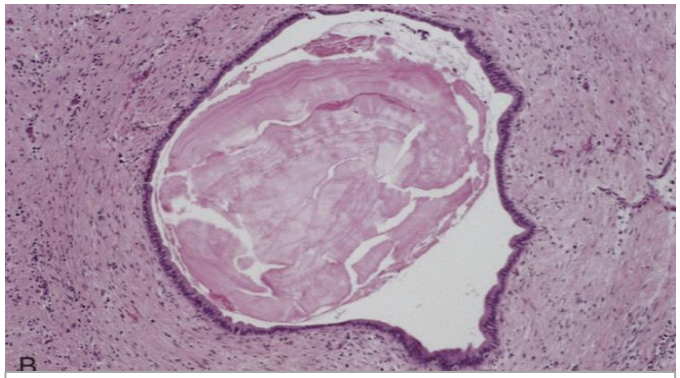
- Idiopathic chronic pancreatitis .
- Tropical pancreatitis* .

Morphology :

❖ **Grossly**: gland is hard, with extremely dilated ducts and visible calcification .



1- fibrosis
2- atrophy
3- residual islets (left) and ducts (right),
4- chronic inflammatory cells
5- acinar tissue.



Higher magnification
1- Dilated ducts
2- inspissated (thick) eosinophilic concretions

*Disease seen in africa and asia. It has been attributed to malnutrition .

Clinical Features :

- Silent or repeated attacks of abdominal pain Or persistent abdominal
- back pain.
- Attacks may be precipitated by alcohol abuse, overeating ,or the use of opiates and other drugs.
- There may be mild fever .
- mild-to-moderate elevations of serum amylase.
- CT scan and MRI shows Calcifications within the pancreas .

Complications :

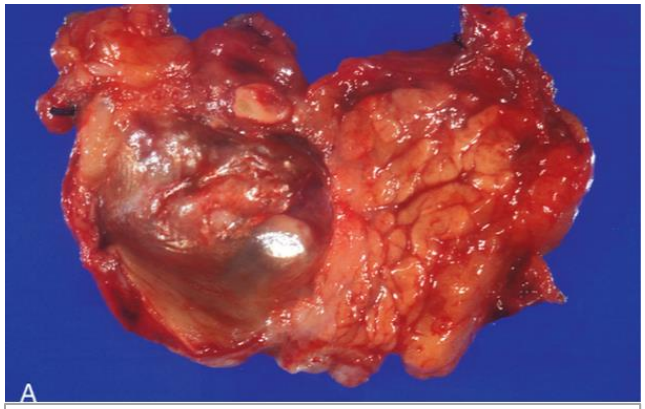
- Chronic malabsorption .
- Severe pancreatic exocrine insufficiency .
- Diabetes mellitus (due to destruction of islets of Langerhans) .
- Severe chronic pain .
- Pancreatic pseudocysts .

Pseudocysts of pancreas

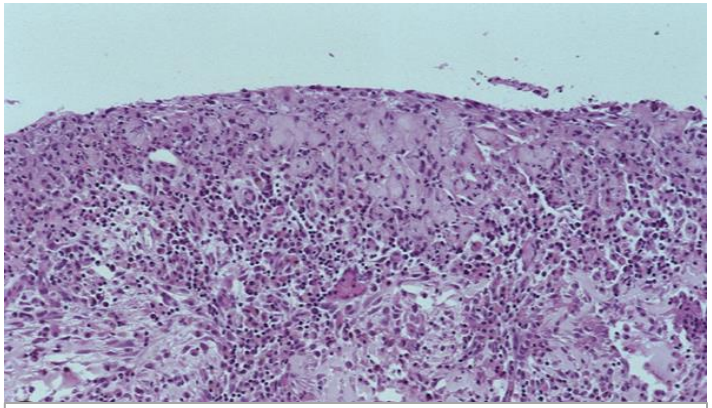
Definition : localized collections of necrotic-hemorrhagic material rich in pancreatic enzymes.

- Lack an epithelial lining "pseudo" .
- They account for majority of cysts in the pancreas.
- Usually arise after an episode of acute pancreatitis, or of chronic alcoholic pancreatitis.

Morphology :



Poorly defined cyst with a necrotic brownish wall.



The cyst lacks a true epithelial lining and instead is lined by fibrin and granulation tissue, with typical changes of chronic inflammation.

Complications : They can produce abdominal pain and predispose to intraperitoneal hemorrhage or peritonitis.

Summary from Robbins

SUMMARY

Pancreatitis

- *Acute pancreatitis* is characterized by inflammation and reversible parenchymal damage that ranges from focal edema and fat necrosis to widespread parenchymal necrosis and hemorrhage; the clinical presentation varies widely, from mild abdominal pain to rapidly fatal vascular collapse.
- *Chronic pancreatitis* is characterized by irreversible parenchymal damage and scar formation; clinical presentations include chronic malabsorption (due to pancreatic exocrine insufficiency) and diabetes mellitus (due to islet cell loss).
- Both entities share similar pathogenic mechanisms, and indeed recurrent acute pancreatitis can result in chronic pancreatitis. *Ductal obstruction* and *long-term alcohol abuse* are the most common causes in both forms. Inappropriate activation of pancreatic digestive enzymes (due to mutations in genes encoding trypsinogen or trypsin inhibitors) and primary acinar injury (due to toxins, infections, ischemia, or trauma) also cause pancreatitis.