JSC Medical University Astsana
Department of Internal Disieases №1

Theme: Chronic pancreatitis

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Chronic Pancreatitis

Definition : it is a benign inflammatory process and fibrosing disorder characterized by

- **irreversible** morphologic changes,
- **Progressive** and
- permanent **loss of** exocrine and endocrine function

Incidence – 3-10 /100k population

- More common in men
- Middle aged > 40 yrs
- 2/3 rds are alcoholics

Chronic pancreatitis

- Etiology
- Pathophysiology
- Clinical features
- Diagnosis
- Management
- Complications

Etiology – (TIGAR –O classification)

- Toxic – Metabolic
- Idiopathic
- Genetic / hereditary
- Autoimmune / immunologic
- Recurrent acute pancreatitis
- Obstructive / mechanical

Toxic / metabolic

- alcohol consumption 60 – 90 %
- Tobacco (changes in composition , oxidative stress)
- Hypercalcemia (trypsinogen & trypsin stabilisation , calculi formation , direct acinar cell injury)
- CRF – uremia

Obstructive

- scars of the pancreatic duct,
- tumors of the ampulla of Vater & head of the pancreas,
- Trauma
- Main pancreatic duct obstruction may lead to stagnation and stone formation by pancreatic juice
- Leads to recurrent pancreatitis – periductal fibrosis - chronic pancreatitis

Idiopathic

- Up to 20% of patients with CP have no known risk factors
- Based on the bimodal age of onset of the clinical symptoms – 2 distinct entities

- **Early onset idiopathic CP** –

1. first 2 decades of life,
2. abdominal pain - predominant clinical feature,
3. pancreatic calcifications and exocrine and endocrine pancreatic insufficiency are very rare at the time of diagnosis

- **Late onset idiopathic CP** :

1. Fifth decade of life,
2. Usually painless course
3. associated with significant exocrine and endocrine pancreatic insufficiency and
4. Pancreatic calcifications

Auto immune / immunological

rare but distinct form of CP characterized by specific histopathologic an immunologic features

- Autoimmune diseases , viral infections (coxsackie)

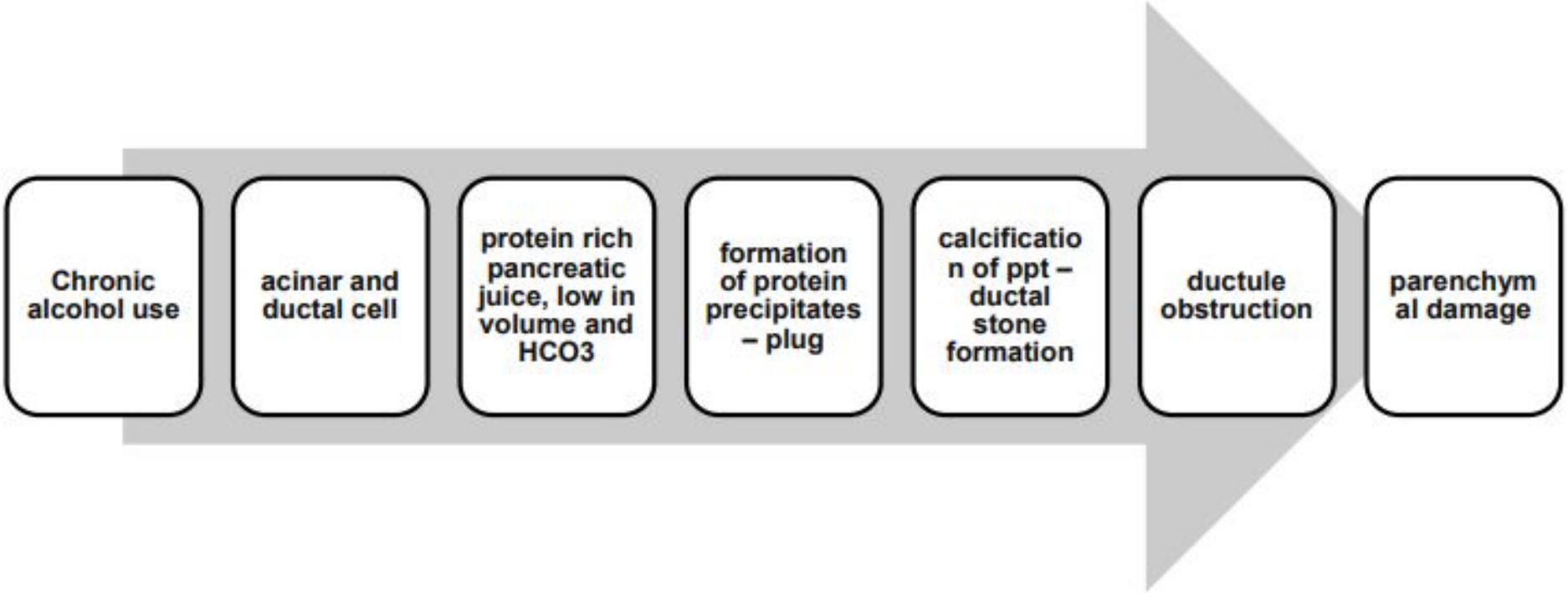
hallmarks are

1. periductal infiltration by lymphocytes and plasma cells
2. granulocytic epithelial lesions & destruction of the duct epithelium
3. venulitis

- minimal abdominal pain
- diffuse enlargement of the pancreas without calcifications or pseudocysts
- most commonly involves the head of the pancreas and the distal bile duct.

PATHOGENESIS

Ductal obstruction hypothesis



Pancreatic ductal stone are seen in alcoholic, tropical, hereditary, idiopathic

Sleisenger and Fordtran's - 9th edition.

Toxic metabolic hypothesis

(alcohol) Direct injurious effect on acinar and ductal cells

Increased membrane lipid peroxidation (oxidative stress), free radical production

Increase acinar cell sensitivity to pathogenic stimuli

Stimulate CholeCystoKinin(CCK) production (duodenal I cells) – activation of proinflammatory transcription factor

Necrosis fibrosis hypothesis

Repeated episodes of acute pancreatitis with cellular necrosis or apoptosis, healing replaces necrotic tissue with fibrosis

Evidence from natural history studies - more severe and frequent attacks

Clinical features

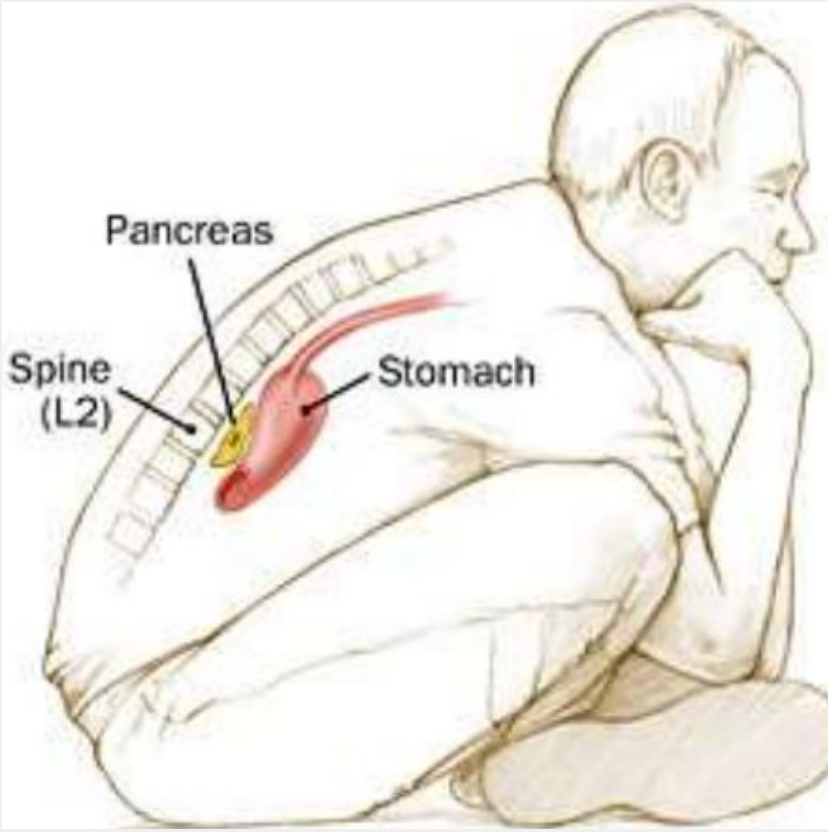
- Abdominal Pain
- Exocrine insufficiency occurs in 80% to 90%
- steatorrhea,
- diarrhea,
- fat-soluble vitamin deficiency, such as bleeding, osteopenia, and osteoporosis,
- Endocrine insufficiency - diabetes mellitus
- Jaundice or cholangitis
- Rarely upper GI bleed

Abdominal Pain

• most common and most debiliating

• Initially pain *manifests after* consumption of food , later on it becomes continuous and affects quality of life

• epigastrium, often with irradiation to the back.
• boring, deep, and Penetrating
• *relieved* by leaning forward, by assuming the knee-chest position on 1 side
• Loses appetite , wt loss , addiction to narcotic analgesics



Exocrine insufficiency

• Steatorrhea and azotorrhea (protein maldigestion) do not usually occur until pancreatic enzyme secretion is reduced to less than 10% of the maximum output

• Advanced chronic pancreatitis, maldigestion of fat, protein, and carbohydrates occur - present with diarrhea and weight loss

• median time to development of exocrine insufficiency was 13.1 years in patients with alcoholic chronic pancreatitis

• Deficiencies of fat-soluble vitamins
• Significant vitamin D deficiency and osteopenia or even osteoporosis occur
• Bleeding manifestations

Endocrine insufficiency :

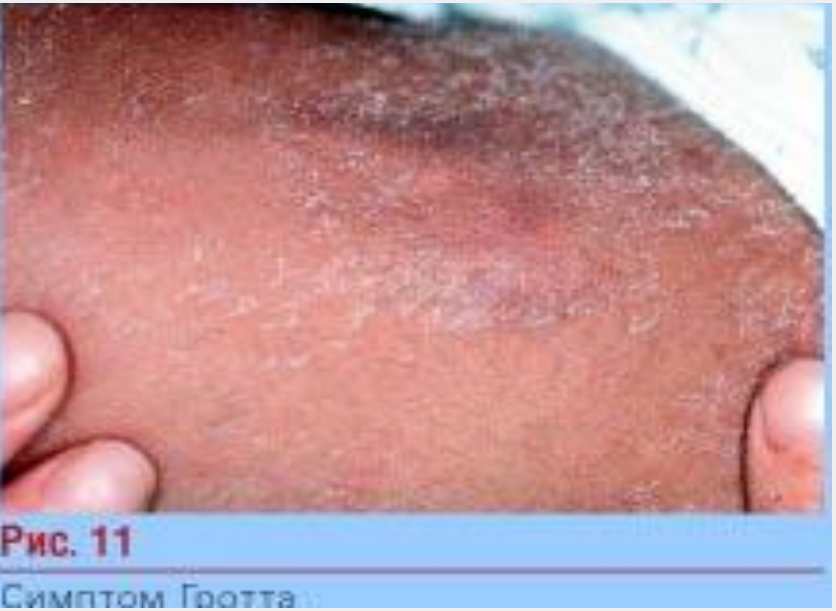
- Chronic pancreatitis also affects islet cell populations - 40% to 80% of patients will have clinical manifestations of *diabetes mellitus*
- Islet cells appear to be relatively resistant to destruction in chronic pancreatitis - Diabetes mellitus typically manifests late

Extrapancreatic complications

- *Jaundice* may be seen in the presence of coexistent alcoholic liver disease or bile duct compression within the head of the pancreas. & duodenal obstruction
- A *palpable spleen* may also rarely be found in patients with thrombosis of the splenic vein as a consequence of chronic pancreatitis or in patients with portal hypertension due to coexistent chronic liver disease.

Physical examination

on the skin of the abdomen, chest, sometimes in the back area you can see clearly delimited bright red spots - a **symptom of Tuzhilin or "red droplets";**



atrophy of subcutaneous fat in the area corresponding to the projection of the pancreas on the anterior abdominal wall - **Grott's symptom;**

Diagnosis

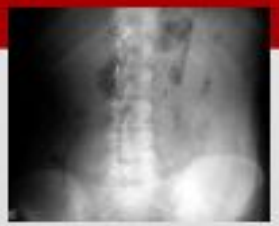
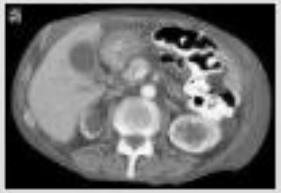
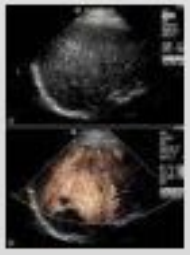
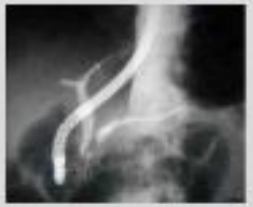
- No single test is adequate
- Tests for function
- Tests for structure
- Both are more accurate in advanced disease .

Tests of function – hormone stimulation

- Direct Tests
  - Secretin/ secretin CCK test
- Indirect Tests
  - Fecal elastase
  - Fecal chymotrypsin
  - Serum trypsinogen (trypsin)
  - Fecal fat
  - Blood glucose

Tests of structure

- Plain film of the abdomen
- CT
- Ultrasonography
- MRI, particularly MRCP
- ERCP


Classics of Chronic pancreatitis

Pancreatic calcification

Steatorrhea

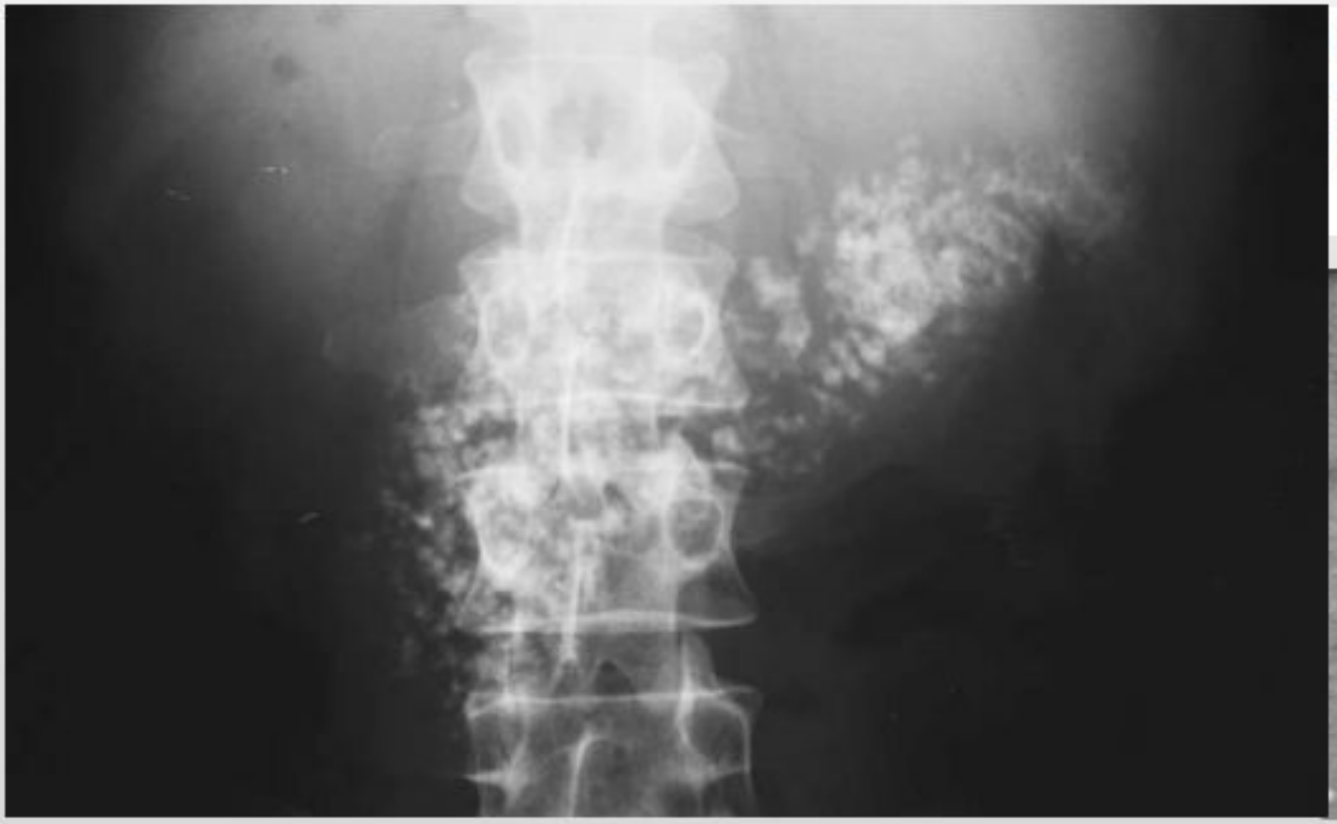
Diabetes mellitus

Found in less than a third of pts with CP

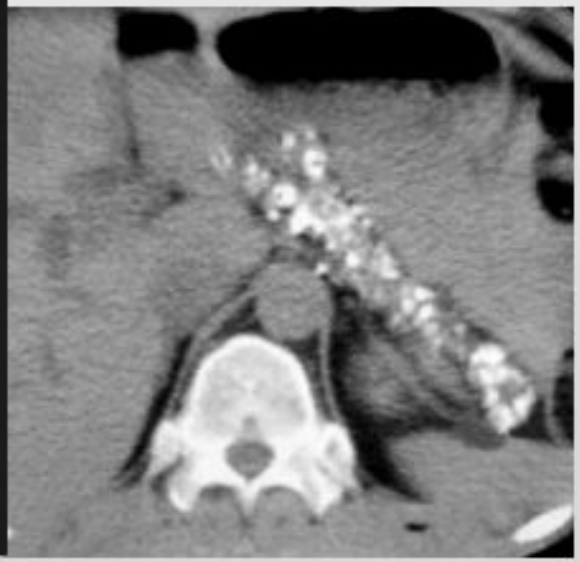
- abnormal secretin stimulations test when >60 % affected
- Serum trypsinogen < 20ng/ml,
- Fecal elastase < 100mcg/mg stool - severe exocrine insuf.

Plain films

- ***Pancreatic calcifications*** **are shown in 25-59% of patients.**
- **This feature is pathognomonic for chronic pancreatitis.**
- **Calcification is punctate or coarse, and it may have a focal, segmental, or diffuse distribution.**

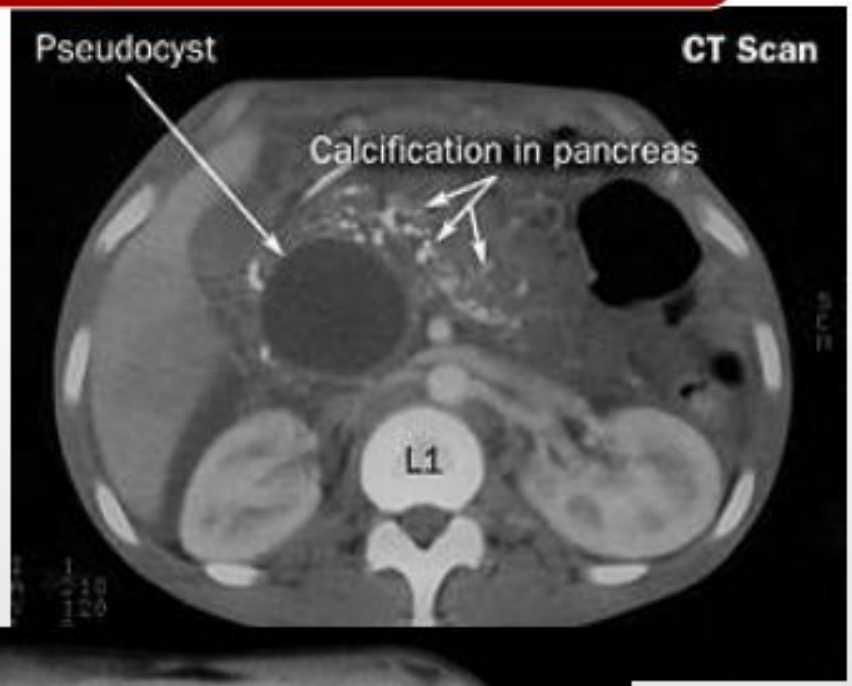


chronic pancreatitis with marked calcification of the pancreatic parenchyma.



CT Findings

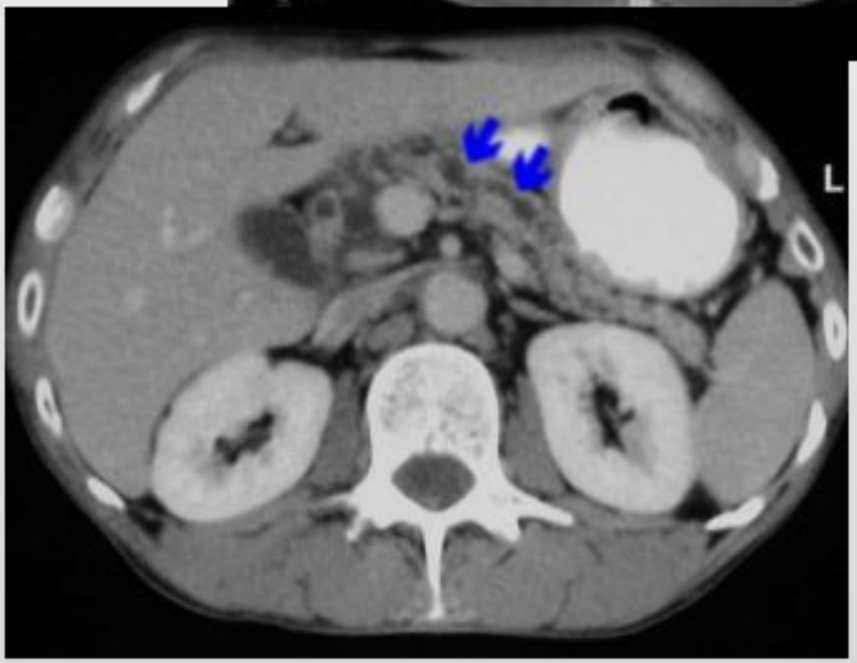
Currently, CT is regarded as the *imaging modality of choice* for the initial evaluation of suggested chronic pancreatitis.



The diagnostic features of:

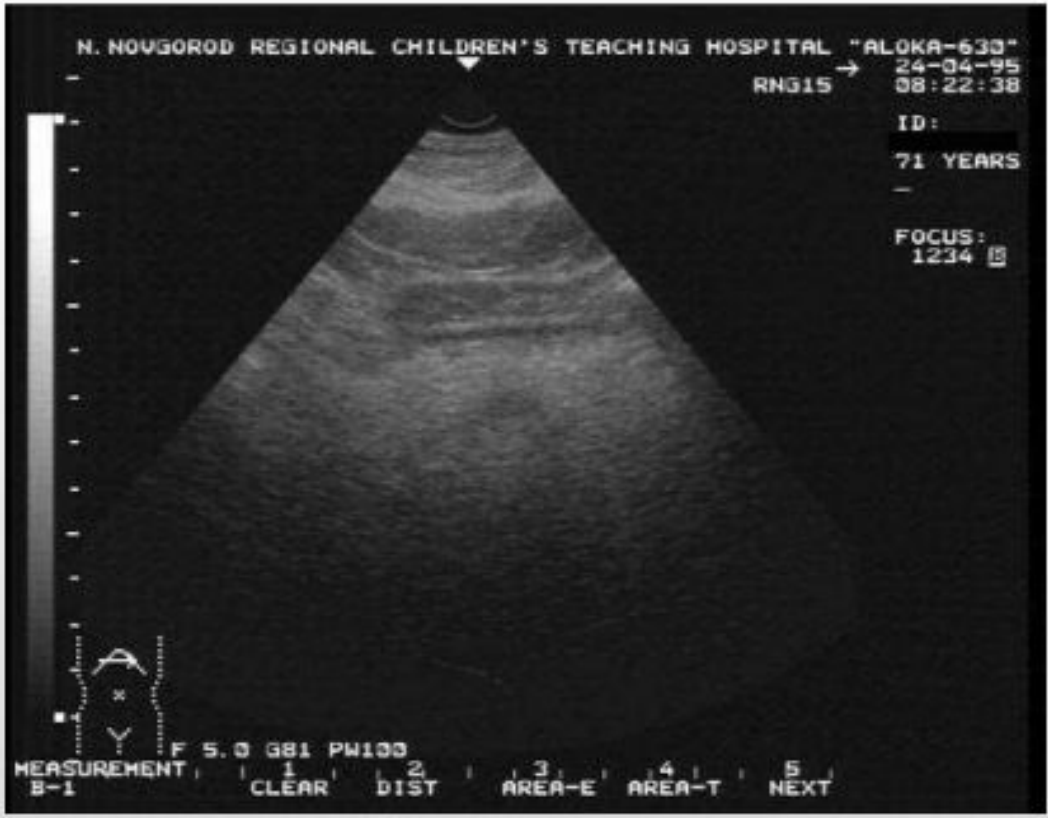
- **pancreatic enlargement,**
- **pancreatic calcifications,**
- **pancreatic ductal dilatation,**
- **thickening of the peripancreatic fascia, and**
- **bile duct involvement**

are depicted well on CT scans.



ULTRASOUND

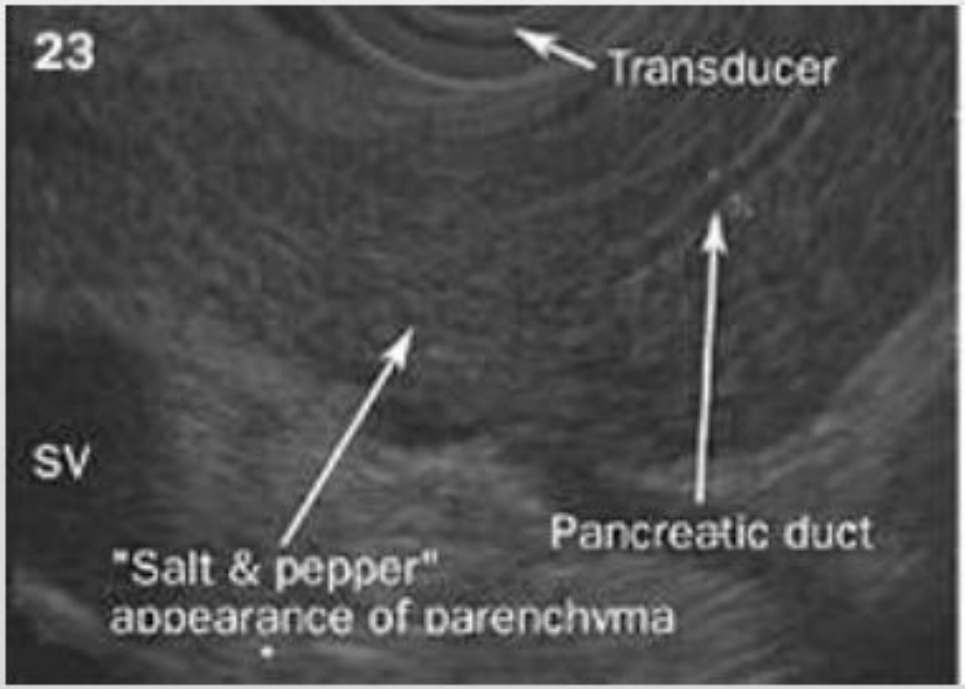
- Ultrasonography is ***the first modality to be used in patients presenting with upper abdominal pain***, although the direct diagnosis of chronic pancreatitis is not always possible.
- In early disease, the pancreas may be enlarged and hypoechoic, with ductal dilatation. Later, the pancreas becomes heterogeneous, with areas of increased echogenicity and focal or diffuse enlargement.

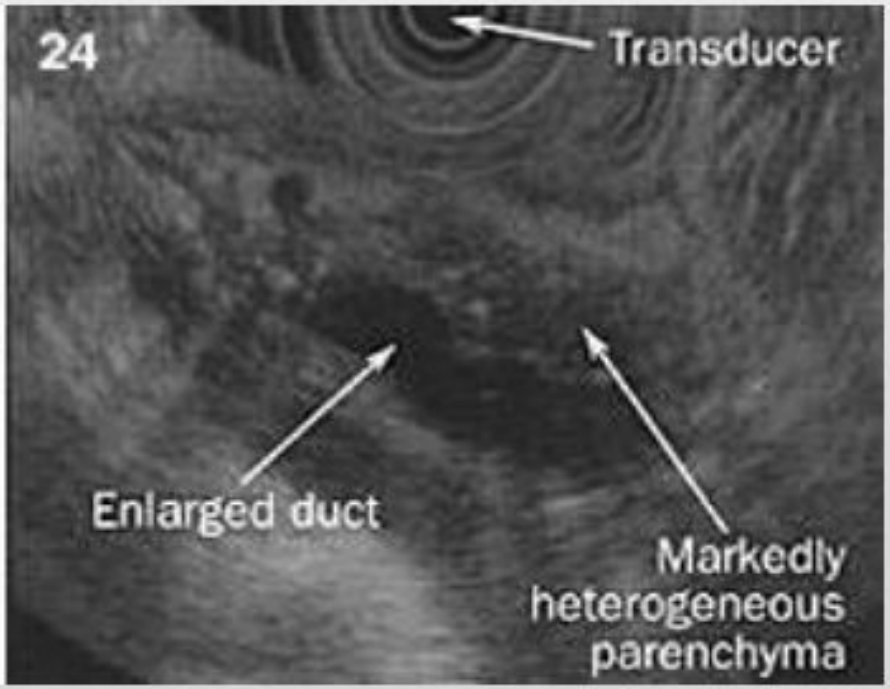


Chronic pancreatitis in phase of exacerbation - an uneven outline of the gland and heterogeneous structure of pancreatic tissue.

ULTRASOUND

- In late stages of the disease, the pancreas becomes atrophic and fibrotic, and it shrinks. These changes result in a small, echogenic pancreas with a heterogeneous echotexture.
- Pseudocysts may occur, and focal hypoechoic inflammatory masses may mimic pancreatic neoplasia.
- Calculi and calcification in the gland result in densely echogenic foci, which may show shadow

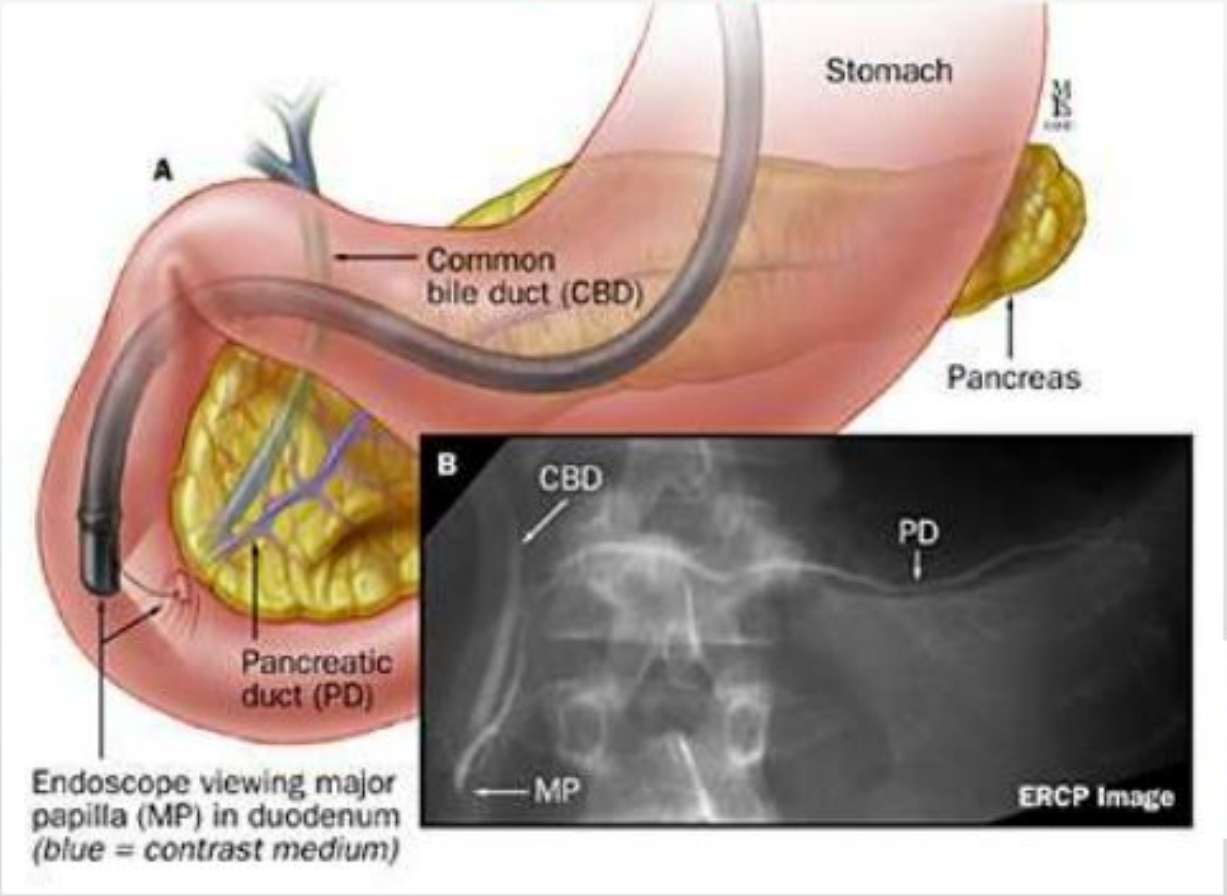




ERCP

Endoscopic retrograde cholangiopancreatography (ERCP)

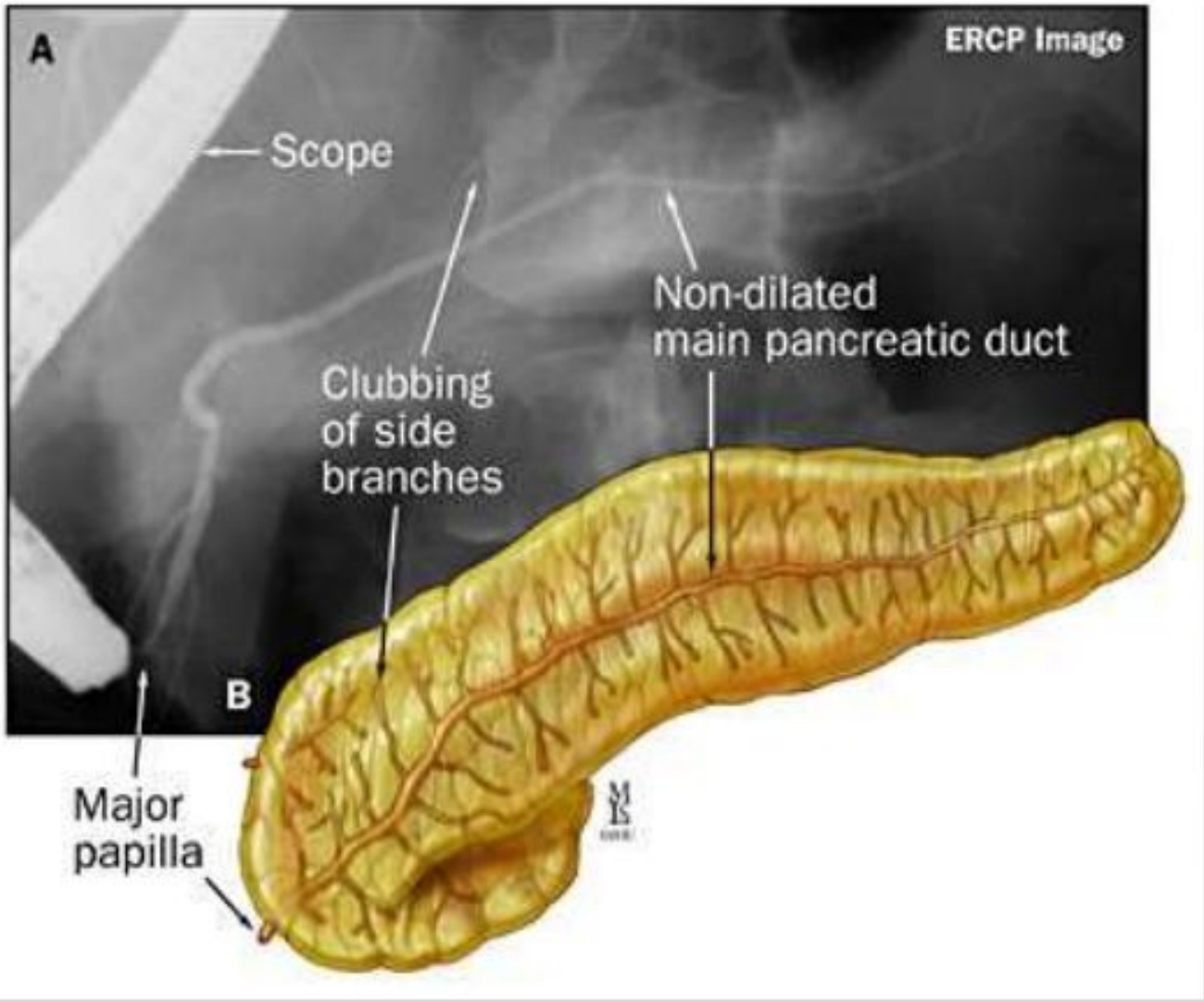
ERCP is the most sensitive and specific technique in the investigation of chronic pancreatitis, although *it is invasive and may cause an acute episode of pancreatitis and ascending cholangitis.*



ERCP of normal pancreatic and biliary ducts.

ERCP

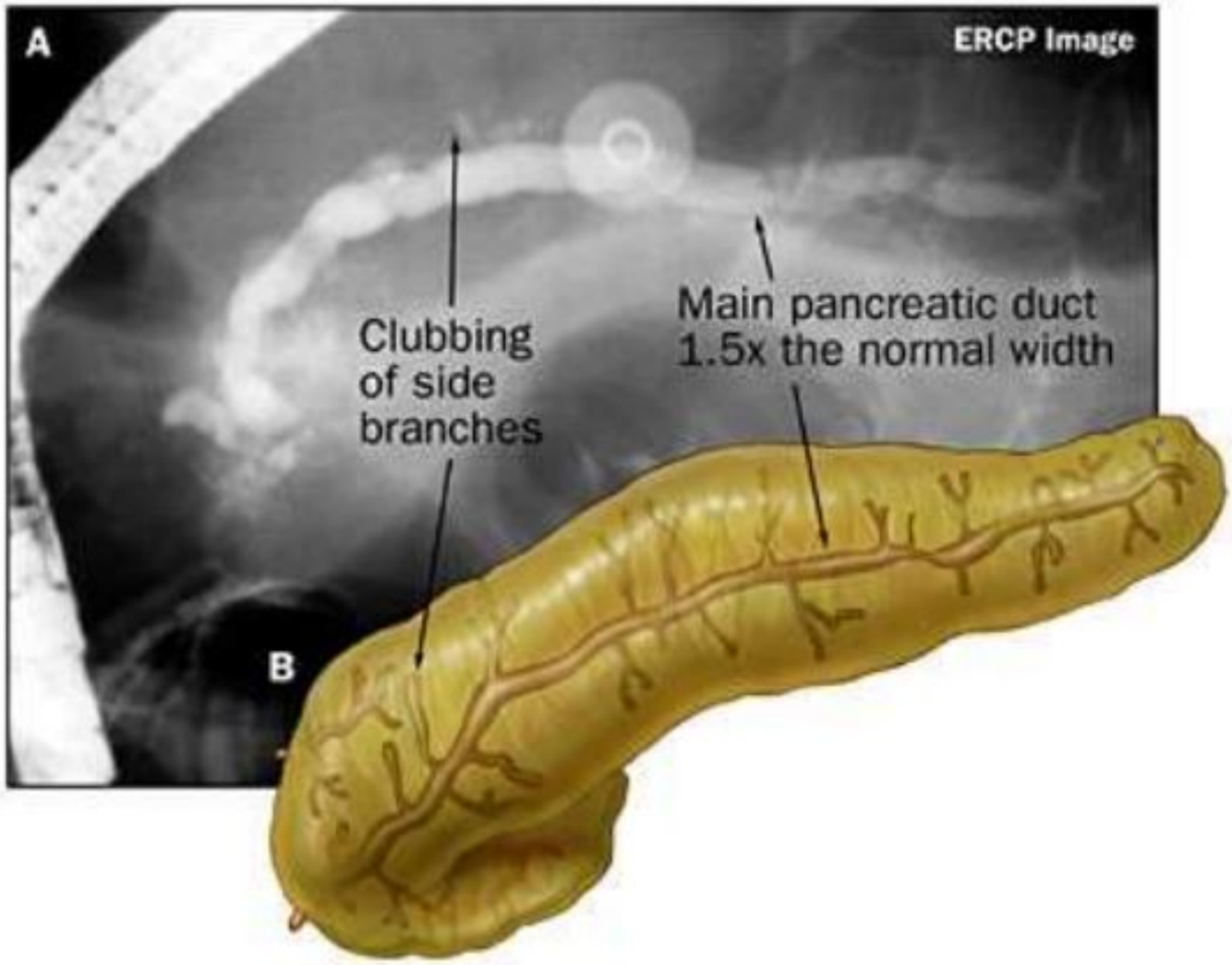
Endoscopic retrograde cholangiopancreatography (ERCP)



Mild pancreatitis **may present with minimal dilation of the main pancreatic duct and some clubbing of the side branches of the duct**

ERCP

Endoscopic retrograde cholangiopancreatography (ERCP)



The patient with *moderately-staged chronic pancreatitis* shows moderate dilation of the main pancreatic duct (1.5 times the normal size) This is accompanied by moderate clubbing of the side branches of the main pancreatic duct

Treatment

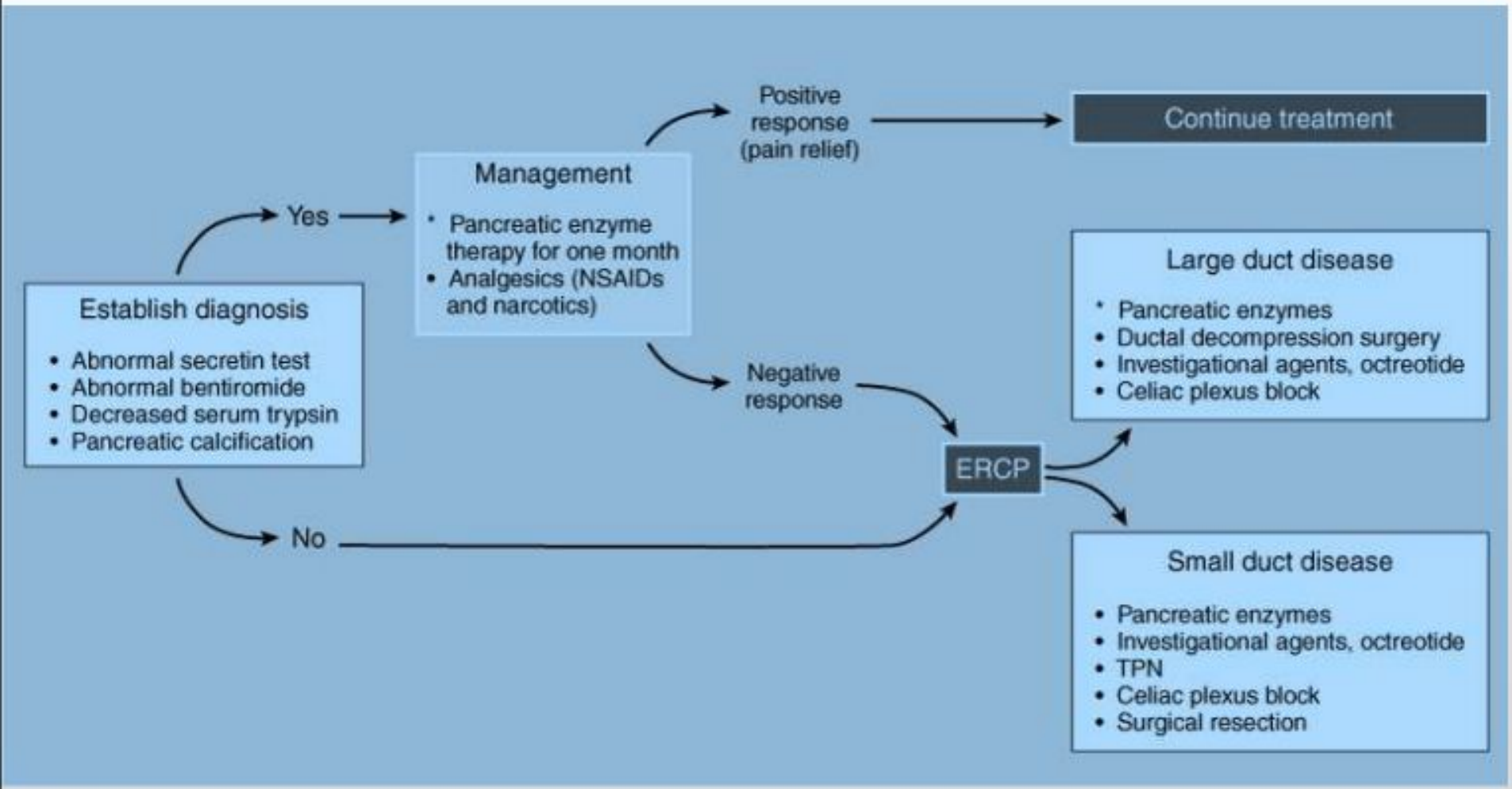
- Aim - Pain control and management of maldigestion
- Pain
  - Avoid alcohol
  - Low fat meals
  - Antipain – narcotics tramadol,codeine(addiction)
  - Surgical pain control
    - Resection (local - - - - 95%) –causes pancreatic insufficiency
    - **Splanchinectomy, celiac ganglionectomy, nerve block**
  - Endoscopic treatment
    - Sphinctorotomy, dilatation of strictures, caliculi removal, duct stenting
      - Complications– acute pancreatitis, abscess, ductal damage, death
  - Pancreatic enzymes- Non enteric coated

Pancrelipase → CREON,Ultresa.75000-80000ME for food intake

Treatment of maldigestion

- Pancreatic enzyme replacement
  - 2-3 enteric coated with meals
  - adjuvants with conventional tablets – H2 blockers, PPI, Na bicarbonate,
- Steatorrhea can be abolished if 10 % of normal lipase amount can be delivered to the duodenum at the right time.

Approach


Establish diagnosis
• Abnormal secretin test
• Abnormal bentiromide
• Decreased serum trypsin
• Pancreatic calcification
Yes
Management
• Pancreatic enzyme therapy for one month
• Analgesics (NSAIDs and narcotics)
Positive response (pain relief)
Continue treatment
Negative response
No
ERCP
Large duct disease
• Pancreatic enzymes
• Ductal decompression surgery
• Investigational agents, octreotide
• Celiac plexus block
Small duct disease
• Pancreatic enzymes
• Investigational agents, octreotide
• TPN
• Celiac plexus block
• Surgical resection

Complications

Complications of chronic pancreatitis include:

- ***Pseudocyst formation***
- Fistula formation
- Pseudoaneurysms of large arteries close to the pancreas
- Stenosis of the common bile duct
- Splenic and/or portal venous obstruction

- Diabetes can develop in 70-90% of patients with chronic calcific pancreatitis

References

1. Chronic pancreatitis, clinical protocol RCRZ 2013
2. Sleisenger & Fordtran's gastrointestinal and liver disease 9th edition
3. https://www.slideshare.net/Prudv/chronic-pancreatitis-57132913?from_action=save