

# Chronic Pancreatitis

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## Presentation Plan

1. Definition, classification
2. Pathophysiology
3. Etiology
4. Clinical findings
5. Laboratory findings
6. Radiological findings
7. Diagnosis
8. Differential diagnosis
9. Treatment
10. Complications

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## Definition

- Inflammatory event characterized by **fibrous tissue** development after damage to the **endocrine** and **exocrine** structures of the pancreas
- Histologically and functionally **irreversible**, but not always progressive
- Incidence: 4-8/100 000

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## Classification

Chronic calcified pancreatitis	Chronic obstructive pancreatitis	Chronic inflammatory pancreatitis	Chronic autoimmune pancreatitis	Asymptomatic pancreatic fibrosis
<ul style="list-style-type: none"><li>▪Alcohol</li><li>▪Hereditary</li><li>▪Tropical</li><li>▪Hyperlipidemia</li><li>▪Hypercalcemia</li><li>▪Drugs induced</li><li>▪Idiopathic</li></ul>	<ul style="list-style-type: none"><li>•Pancreatic tumors</li><li>•Ductal stricture</li><li>•Pancreatic divisum affected by gallstones or trauma</li></ul>	<ul style="list-style-type: none"><li>▪Idiopathic</li></ul>	<ul style="list-style-type: none"><li>•Coexistence with autoimmune diseases</li><li>•Sjögren syndrome</li><li>•Primary biliary cholangitis</li></ul>	<ul style="list-style-type: none"><li>•Chronic alcoholism</li><li>•Endemic cases in tropical regions</li></ul>

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## Pathophysiology

- Oxidative Stress Theory
  - Alcohol metabolise the acinar cells (similar to hepatocytes) to produce oxidative stress and damage to lipid membranes
- Toxic-Metabolic Theory
  - Modification of cell metabolism by direct toxic effects of alcohol on acinar cells, resulting in excessive lipid accumulation (steatopancreatopathy)

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## Pathophysiology

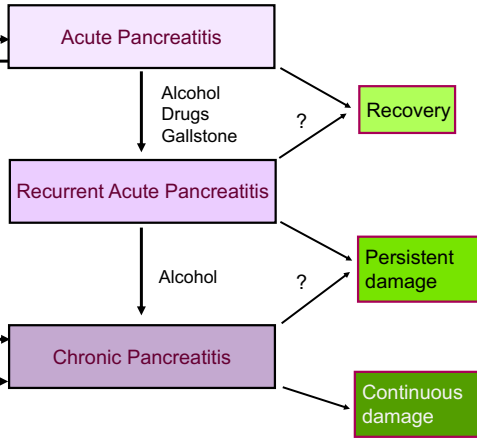
- Stone and Channel Obstruction Theory
  - The formation of protein plugs due to lack of congenital "lithostatine" deficiency
- Necrosis-Fibrosis Theory
  - Chronic pancreatitis as a result of focal inflammation and necrosis

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Alcohol  
Drugs  
Infections  
Obstruction  
Trauma  
Gallstone

Severe acute alcoholic pancreatitis

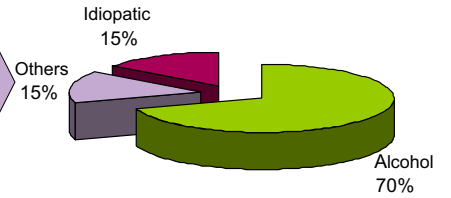
Alcohol  
Hereditary  
Obstruction  
Others ?



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## Etiology

- Cystic fibrosis
- Hereditary pancreatitis
- Tropical pancreatitis
- Hypertriglyceridemia
- Otoimmune
- Hyperparathyroidism
- Fibrosenotic
- Trauma
- Pancreatic divisum



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## Clinical Findings

- Abdominal pain (intermittent or continuous, moderate, spread on the back)
- Nausea and vomiting
- Ascites
- Upper GI bleeding
- Weight loss
- Jaundice
- Diabetes mellitus (80% loss of pancreatic mass).
- Steatorrhea (pancreatic lipase secretion is less than 10%)

### Physical Examination

- Abdominal sensitivity, abdominal mass, splenomegaly (splenic vein thrombosis)

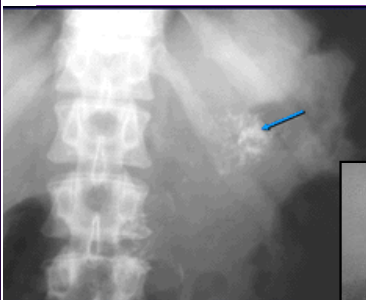
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## Laboratory Findings

- It is difficult to diagnose by looking at only serum enzyme levels in the early period
- Isoamylase, lipase, trypsin and elastase levels can be low, normal and increased
- Pressure on the main bile duct → Increase in cholestasis enzymes and bilirubin
- Decreased serum albumin and calcium
- Stool examination includes neutral fat droplets and fatty acids

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## Calcification

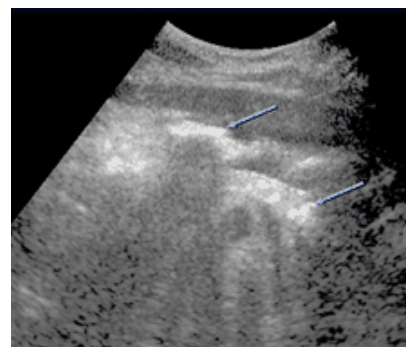


Direct Abdominal Radiograph



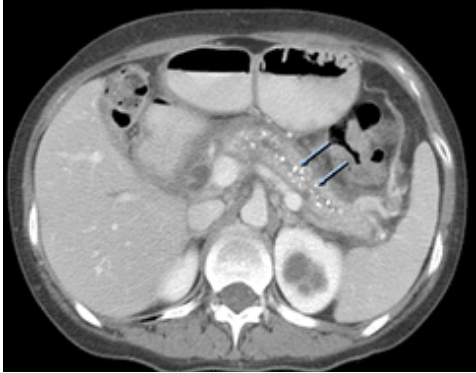
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## Calcification (USG)



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## Calcification (CT)



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## Diagnosis

- There is not enough single test to diagnose
- Functions tests
- Structural tests
- In advanced disease, both give more accurate results
- Functional changes in the early period and structural changes in the late period

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## Diagnosis

- I. Measurement of pancreatic products in blood
  - A. Enzymes
  - B. Pancreatic polypeptide
- II. Measurement of exocrine secretion of pancreas
  - A. Direct measurement
    1. Enzymes
    2. Bicarbonate
  - B. Indirect measurement
    1. Bentiromide test
    2. Schilling test
    3. Fat, chymotrypsin or elastase concentration in feces
    4. [14C]-olein absorption
- III. Imaging techniques

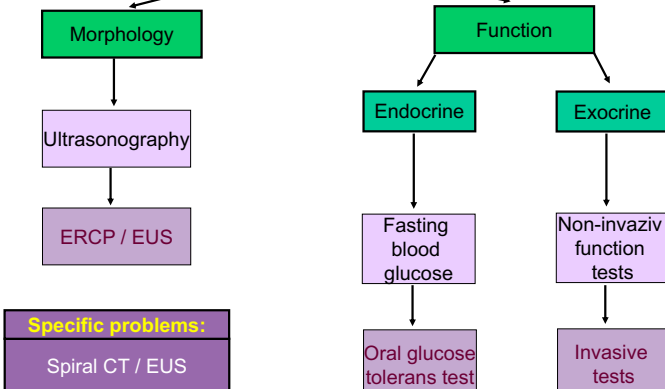
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## Diagnosis

- I. Measurement of pancreatic products in blood
- II. Measurement of exocrine secretion of pancreas
- III. Imaging techniques
  - A. Direct abdominal radiograph
  - B. Transabdominal ultrasonography (USG)
  - C. CT
  - D. ERCP
  - E. MRCP
  - F. Endoscopic USG

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## Diagnosis



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## Differential Diagnosis

- Peptic ulcer
- Biliary tract disorders
- Mesenteric vascular disorders
- Gastric malign disorders
- Pancreas cancer

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## Treatment

### Target

Control of pain and treatment of maldigestion

Diet  
 Vitamins, Ca  
 Analgesics  
 Pancreas enzymes  
 Others...  
 ....

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## Dietary Treatment of Exocrine Insufficiency

### Diet and exogenous enzymes

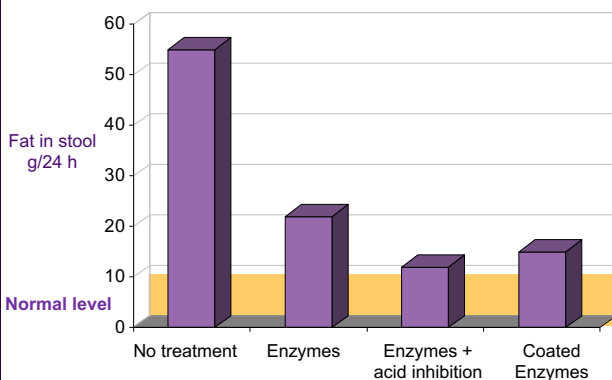
- Changing fat intake
- Medium chain triglycerides
- Enzym replacement
  - With or without coated
  - Acid suppression

### Vitamin and other

- Fat-soluble vitamins
- Ca
- Vit-B<sub>12</sub>

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## Pancreatic enzyme replacement treatment



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## Treatment of pain in chronic pancreatitis

1. Antispasmodic, analgesic, opiate analogs
2. Alcohol, cigaret **STOP**
3. Low fat diet
4. Reduction of inflammation
5. Suppression of secretion
  - a) PPI
  - b) Pancreatic enzymes
  - c) Octreotide

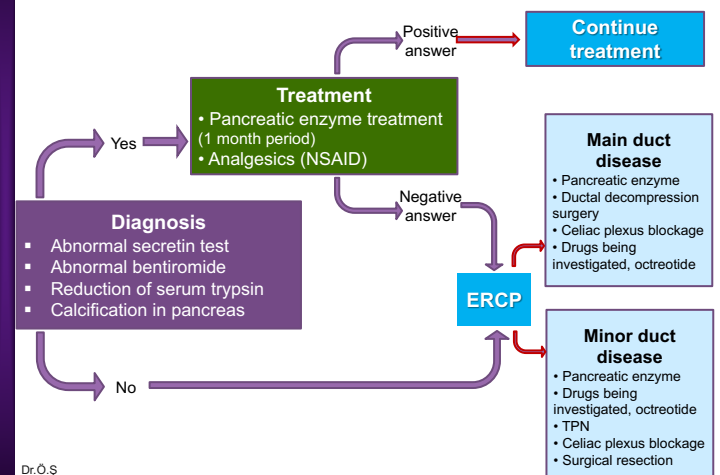
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## Treatment of pain in chronic pancreatitis

6. Treatment for the nerves
  - a) Drugs
  - b) Nerve blockage
7. Reduce oxidative stress
  - a) Antioxidants
  - b) Allopurinol
8. Obstruction correction
  - a) Endoscopic treatment
    - i. Sphincterotomy
    - ii. Lithotripsy
    - iii. Dilatation of strictures, stent
  - b) Surgery
    - i. Resection
    - ii. Celiac ganglionectomy

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## Treatment (summary)



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## Complications

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- Pancreas pseudocyst, obstruction
- Bleeding (peptic ulcer, gastritis, pseudocyst, varices)
- Pancreatic calcifications
- Duodenal obstructions
- Cholestasis (biliary tract obstruction) (jaundice, cholangitis, biliary cirrhosis)
- Pancreatic fistula (internal or external)
- Pancreatic ascites (pleural, peritoneal and pericardial effusion)
- Pancreas cancer (**lifetime risk 4%**)
- Others (DM, osteomalasia, A D E K and vit. B 12 deficiency, giardiasis...)

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