Complications of Acute Pancreatitis

The Complications of Acute Pancreatitis

- Fluid collections
- Pancreatic ascites/pleural effusion
- Pancreatic pseudocyst
- Pancreatic necrosis
- Infected pancreatic abscess
- Hemorrhage/pseudoaneurysm

Fluid Collections

- accumulation of fluid in and around the pancreas
- Partly inflammatory exudates
- contain enzyme-rich pancreatic secretions as a consequence of parenchymal disruption
- occur early (within 48 hours),
  - resolve often,
  - they are the precursor of pancreatic pseudocysts
  - fluid collection, when present for 4 weeks, is termed a *pseudocyst*
- extension are
  - into the lesser sac,
  - behind the pancreatic head,
  - behind the left and right colons on the psoas muscle,
  - the small bowel mesentery
  - bulging through the transverse mesocolon

Pancreatic Ascites and Pleural Effusions

- sometimes termed *internal pancreatic fistulas*
- often due to the chronic leakage of a pseudocyst secondary to
  - alcoholic pancreatitis in adults and
  - traumatic pancreatitis in children

Diagnostic aspiration will reveal a high amylase concentration

operative approach is either a

distal resection of the pancreas or

internal drainage into a Roux-en-Y limb of jejunum

Pseudocyst

- A *pseudocyst* is defined as a peripancreatic fluid collection contained by a wall of fibrous granulation tissue that does not have an epithelial lining
- Following acute pancreatitis, pseudocysts are located most often in close proximity to the pancreas, especially in the lesser sac but also may be found in the pelvis, scrotum, mediastinum, and thorax
- fewer than 20% of cases they will be multiple

- With chronic pancreatitis, there is an increased tendency toward multiple, small, and intrapancreatic pseudocysts

Pathogenesis and Classification of Pseudocysts

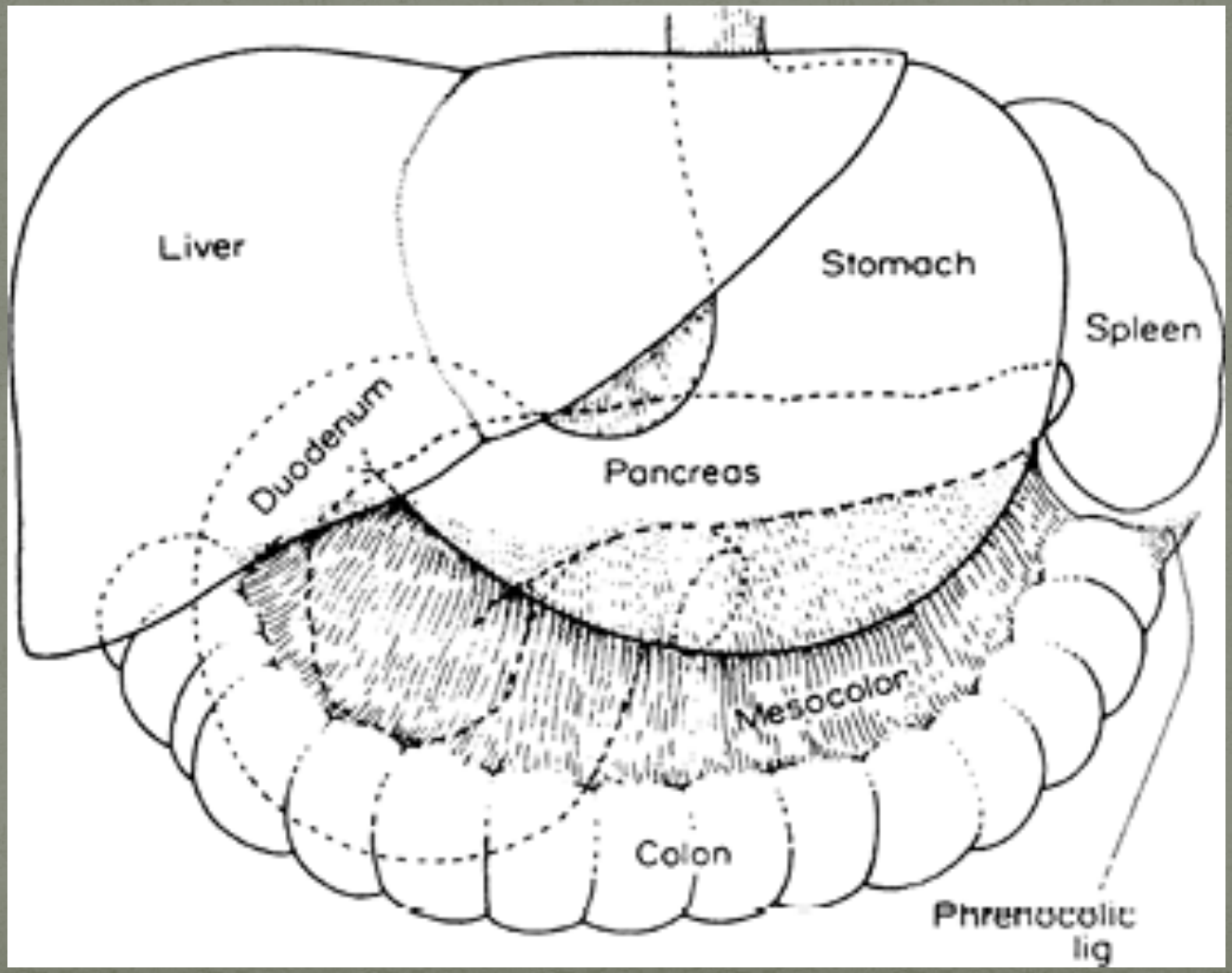
- development of a pseudocyst requires pancreatic duct disruption
- acute pancreatitis (2–10% of cases), trauma, or duct obstruction in chronic pancreatitis
- leakage of enzyme-rich secretion incites a marked inflammatory reaction of the peritoneum, retroperitoneal tissue, and serosa of adjacent viscera
- If the communication between pancreatic duct and pseudocyst persists, the pseudocyst can continue to enlarge, sometimes reaching 20–30 cm in diameter
- consist of a relatively clear watery fluid
- with hemorrhage, it may contain clot and become xanthochromic
- In presence of infection, a pseudocyst will contain pus
- Pseudocyst rupture may result in
  - free ascites,
  - decompression into adjacent stomach or duodenum, or
  - a pancreaticopleural/bronchial fistula.

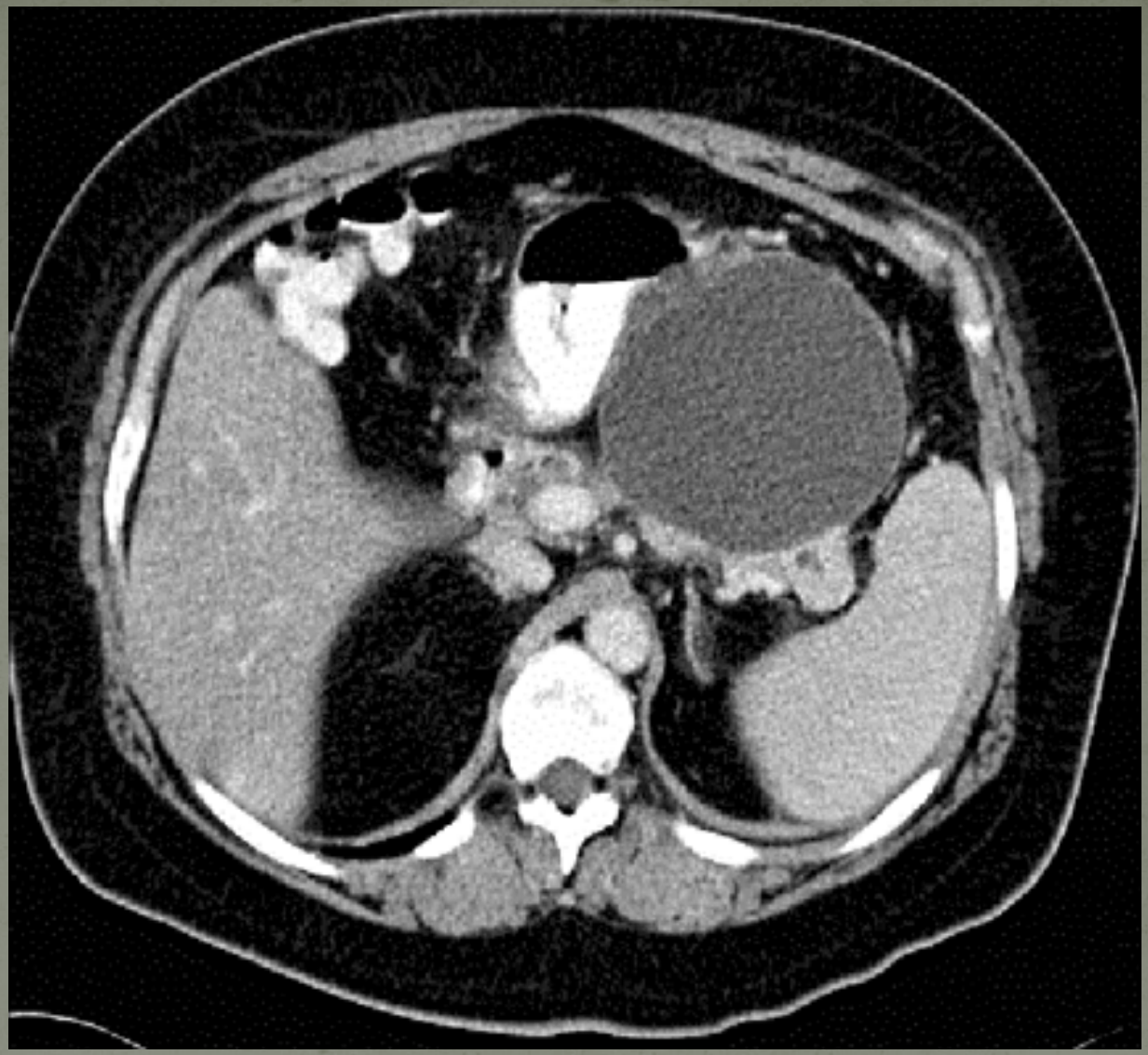
Diagnosis and Investigation

- pseudocyst should be suspected when a patient with acute pancreatitis *fails to recover after a week* of treatment or when, after improving for a time, *symptoms return*
- epigastric discomfort or pain.
- anorexia, early satiety, nausea, mild fever, back pain,
- palpable mass.
- Signs of sepsis usually are not overt.
- In about half the patients there is failure of the serum amylase level to return to normal or a mild (2–4 times normal) secondary rise

- best investigated by contrast-enhanced CT scan which is far better than USG

Anterior relations of Pancreas





Computed tomography scan of pancreatic pseudocyst

The D'egidio Classification of Pancreatic Pseudocysts and the Primary Treatment Options

- Type I - Acute postnecrotic pancreatitis, Normal duct, No duct cyst communication, Treatment - Percutaneous drainage
- Type II - Acute-on-chronic pancreatitis, Abnormal duct (no stricture), duct cyst communication 50:50, Treatment - Internal drainage or resection
- Type III - Chronic pancreatitis, Abnormal duct but with stricture, duct cyst communication almost always exists, Treatment - Internal drainage with duct decompression

Complications

- infection
- leakage
  - rupture of a pseudocyst can occur by erosion into the adjacent gastrointestinal tract,
  - which may resolve the pseudocyst or leave a cystoenteric fistula
- Bleeding
  - life-threatening complication
  - direct erosion of splenic, gastroduodenal, and middle colic vessels
  - action of pancreatic enzymes (especially elastase) on the vessel wall can lead to thinning of the vessel wall and aneurysm and pseudoaneursym formation
- By mass effect, a pseudocyst also can produce
  - early satiety (stomach)
  - stenosis (duodenum)
  - cholestasis (bile duct) and
  - thrombosis (portal, superior mesenteric and splenic veins) leading to portal or segmental hypertension and varices.

Treatment

- An enlarging asymptomatic pseudocyst that has been present for 6 weeks usually is treated
- The following features of a pseudocyst are important in considering the most appropriate treatment:
- *The thickness of the pseudocyst wall*, which is usually a function of the duration of the pseudocyst. This is important because the operative drainage of a pseudocyst requires that it safely accept sutures or staples. After 4–6 weeks, this will not be an issue.
- *The location of the pseudocyst*. If adherent to the stomach or duodenum, the options are different than if the pseudocyst is deep within the retroperitoneum and covered by bowel loops.
- *The contents of the pseudocyst*. Blood may require prior embolization of a pseudoanuerysm. Pus will require drainage, percutaneous or open. Infected necrosum will require débridement.
- The pancreas and the pancreatic duct need separate consideration in planning the treatment of a pseudocyst. The pancreas may warrant treatment in its own right, especially if there is a ductal stricture, a dilated duct, or regional disease warranting resection.

The Treatment Approaches for Pancreatic Pseudocyst

- Open surgical
  - Cystogastrostomy
  - Cystoduodenostomy
  - Roux-en-Y cystojejunostomy
  - Distal pancreatectomy ± splenectomy
  - External drainage
- Laparoscopic
  - Cystogastrostomy
  - Cystoduodenostomy
  - Roux-en-Y cystojejunostomy
  - Distal pancreatectomy ± splenectomy
  - External drainage
- Radiologic
  - Percutaneous drainage
  - Percutaneous transgastric drainage
- Endoscopic
  - Transpapillary pancreatic duct stent
  - Transgastric stent
  - Transduodenal stent

Chronic Pancreatitis

- chronic inflammatory condition of the pancreas
- characterized by severe upper abdominal pain that often progresses to
- pancreatic exocrine (malabsorption) and endocrine (diabetes mellitus) insufficiency.

ETIOLOGY AND CLASSIFICATION

- chronic alcoholism is responsible for up to 80%
- gallstone-induced acute pancreatitis only occasionally results in chronic pancreatitis

- etiology-based classification system
- The *TIGAR-O system*
  - Toxic-metabolic,
  - Idiopathic,
  - Genetic,
  - Autoimmune,
  - Recurrent severe acute pancreatitis, and
  - Obstructive

CLINICAL PRESENTATION

- ***Upper abdominal pain*** that is aggravated by meals and radiates to the back is the earliest symptom
  - sitting upright and tilting the torso forward or lying prone alleviates the pain,
  - whereas the supine position tends to aggravate the pain.
- ***Malabsorption***
  - 90% loss of functional pancreas for symptoms such as diarrhea, steatorrhea, and azotorrhea to develop
  - Pancreatic insufficiency resulting from alcohol-induced chronic pancreatitis usually takes 10 to 20 years to develop
  - secretion of lipase is usually diminished earlier than the secretion of the proteolytic enzymes
  - Steatorrhea generally precedes proteinaceous diarrhea
  - Weight loss almost always occurs
  - occasionally significant deficiencies of the fat-soluble vitamins develop

- *Endocrine Insufficiency*
  - develops in up to 60% of patients
  - glucose intolerance frequently develops early in the course of chronic pancreatitis, and
  - clinically evident diabetes occurs later

DIAGNOSIS

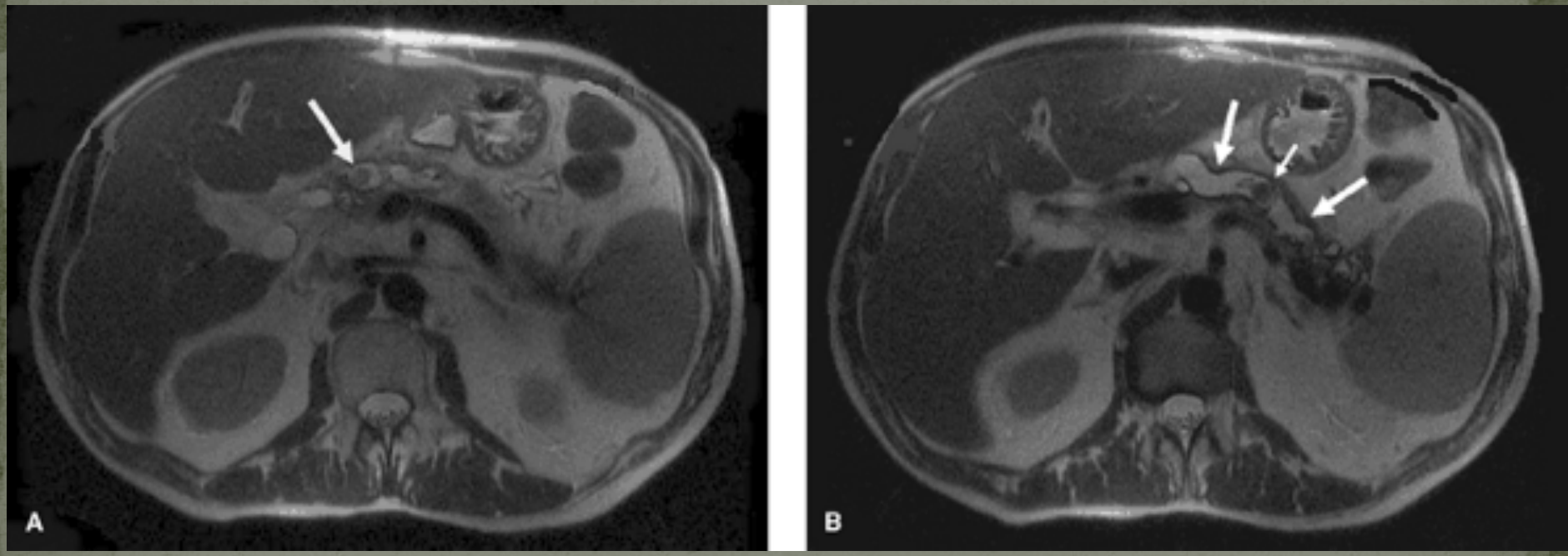
- imaging studies, pancreatic function tests, and histologic evaluation

- Frequently, a typical history combined with a plain radiograph of the abdomen showing the classic findings of speckled calcification of the pancreas is sufficient to clinch the diagnosis

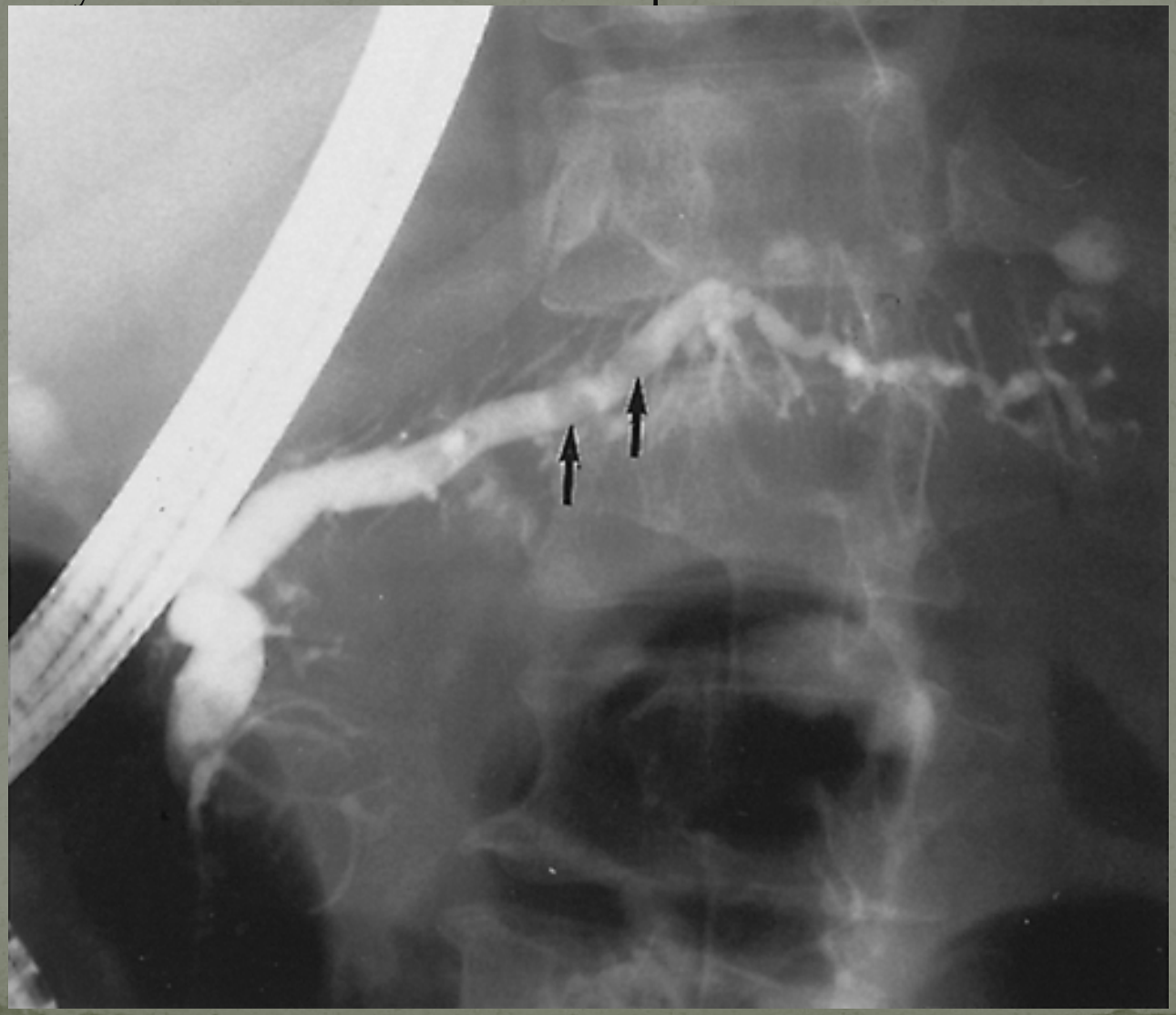
- USG
- CT
- MRI
- ERCP

Abdominal computed tomography in a patient with chronic pancreatitis shows dilatation of the main pancreatic duct

T2-weighted magnetic resonance images of a patient with chronic pancreatitis demonstrating a large stone (arrow) located in the pancreatic duct in the head of the pancreas (A) as well as a large stone (small arrow) located in the dilated pancreatic duct (large arrows) in the body of the pancreas **(B).**



Endoscopic retrograde cholangiopancreatography (ERCP) illustrates moderate dilation of the main pancreatic duct and ectasia of the secondary. Arrows indicate intraductal pancreatic stones.

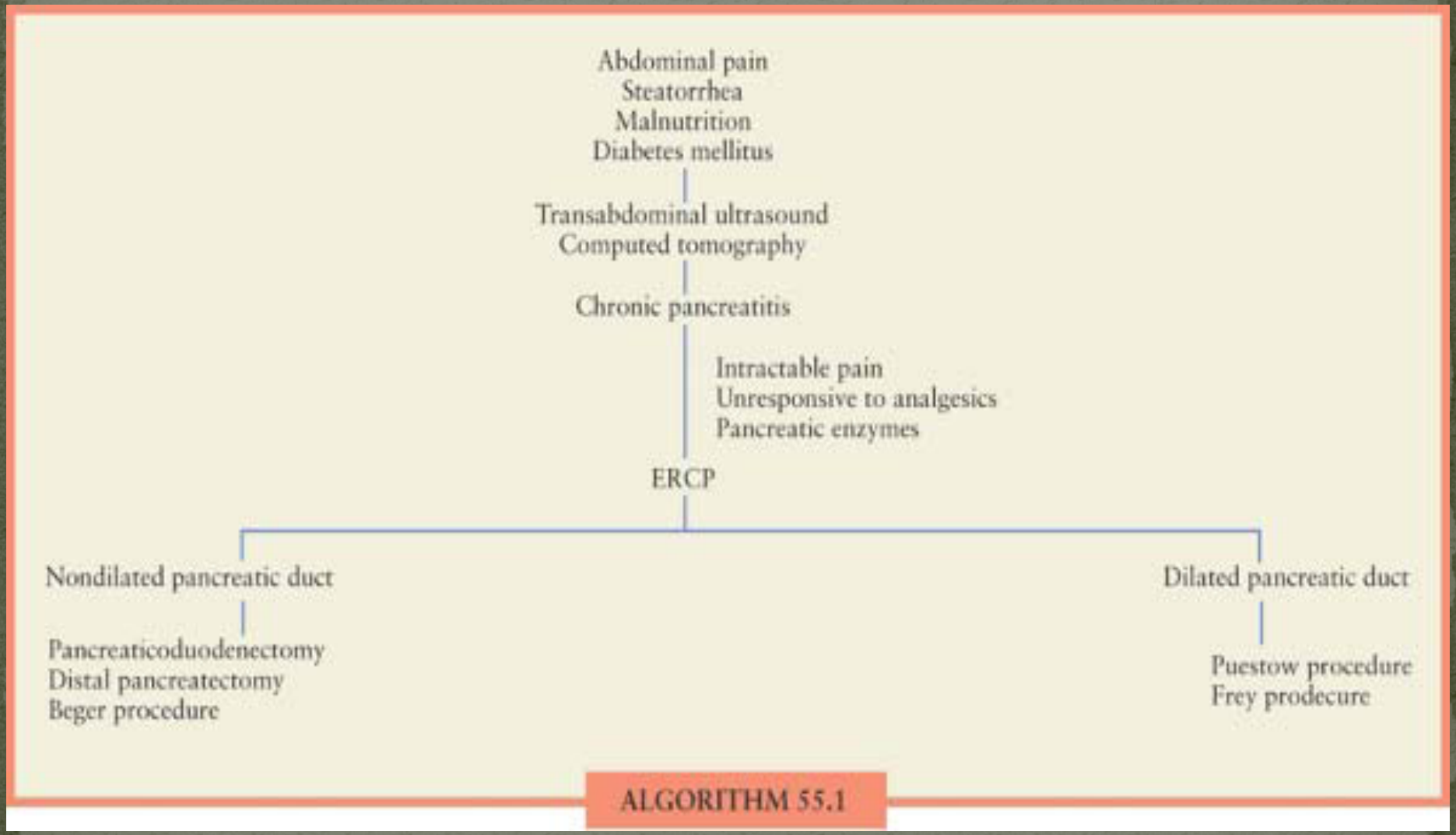


DIFFERENTIAL DIAGNOSIS AND COMPLICATIONS

- most important condition to exclude during evaluation of a patient with chronic pancreatitis is pancreatic cancer

- obstructive jaundice,
- pseudocysts,
- pancreatic ascites and fistulae,
- vascular complications such as splenic artery aneurysm and splenic vein thrombosis, and
- gastrointestinal obstruction
- increased risk of developing pancreatic cancer in patients with chronic pancreatitis.

Treatment



ALGORITHM 55.1

- *Analgesics*
- *Oral replacement therapy in the form of pancreatic enzymes*
- *Celiac plexus blockade* pain relief found to be merely temporary
- *Endoscopic dilation and stent placement* may be used to treat chronic pancreatitis secondary to pancreatic duct obstruction from stones, strictures, or papillary stenosis
- *Operations* to relieve the pain of chronic pancreatitis can be divided into two categories:
  - *drainage procedures for* patients with ductal dilatation (> 7mm) and obstruction
  - *resective procedures* for patients with a diseased pancreas but normal ductal size

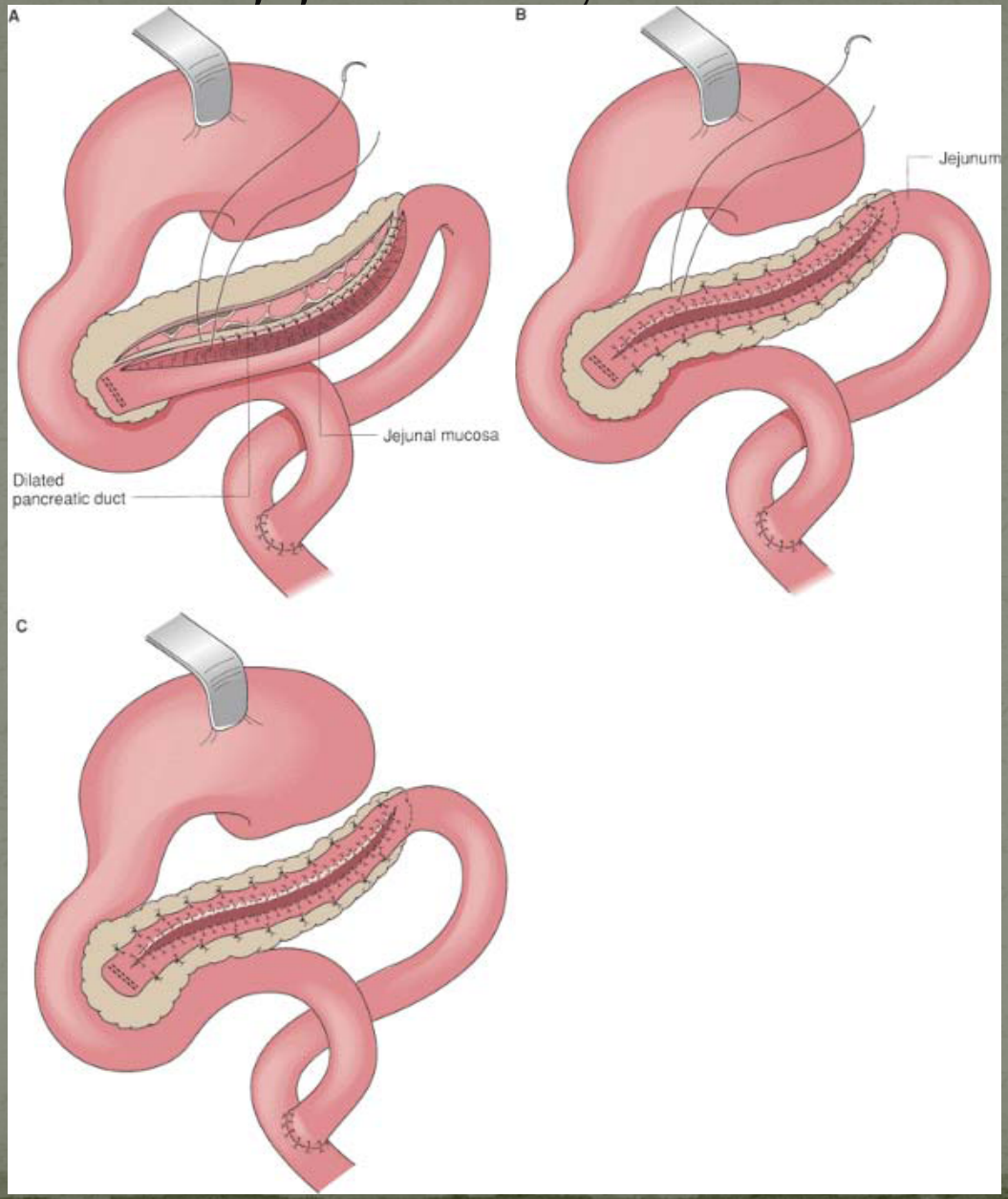
Drainage Procedures

- *Longitudinal Pancreaticojejunostomy (PuestowProcedure).*
- *Local Resection of the Pancreatic Head with Longitudinal Pancreaticojejunostomy (Frey Procedure)*

Resection Procedures

- *Distal Pancreatectomy*
- *Pancreaticoduodenectomy (Whipple Procedure)*
- *Ninety-five Percent Distal Pancreatectomy*
- *Total Pancreatectomy*
- *Duodenum-Preserving Resection of PancreaticHead (Beger Procedure)*

Lateral pancreaticojejunostomy Puestow's procedure



Reconstruction after standard pancreaticoduodenectomy Whipple's Procedure