Pancreatic Benign

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Objectives

Medical Expert:

1. Anatomy and congenital anomalies of the pancreas and pancreatic duct (divisum, annular pancreas and ectopic)
2. Classification of acute pancreatitis
3. Epidemiology and acute pancreatitis
4. Clinical presentation, laboratory and radiologic investigations in acute pancreatitis
5. Criteria for prediction of severity and outcome in acute pancreatitis
6. Management of acute pancreatitis, management of acute necrotizing pancreatitis, management of acute pancreatitis with infected necrosis
7. Indications for surgery in acute pancreatitis
8. Complications of acute pancreatitis
9. Etiology and management of acute pancreatic pseudocysts
10. Diagnosis and management of pancreatic fistulas
11. Etiology and clinical presentation of chronic pancreatitis
12. Diagnosis and imaging in chronic pancreatitis
13. Non-operative and operative management of chronic pancreatitis
14. Indications for surgery in chronic pancreatitis

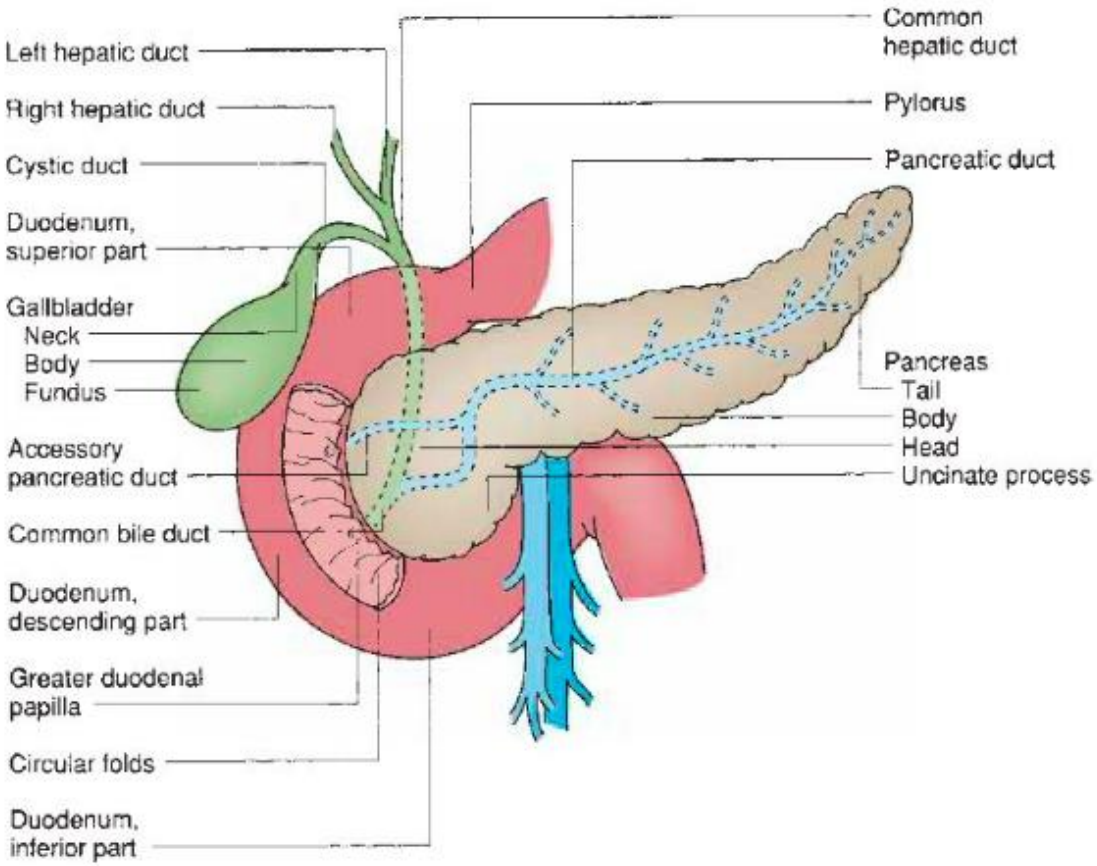
Collaborator:

1. Role of imaging in benign pancreatic disease (ERCP, MRCP, CT, U/S, Hida etc…)
2. Role of nutritional support in acute and chronic pancreatitis
3. Intensive care management of acute pancreatitis

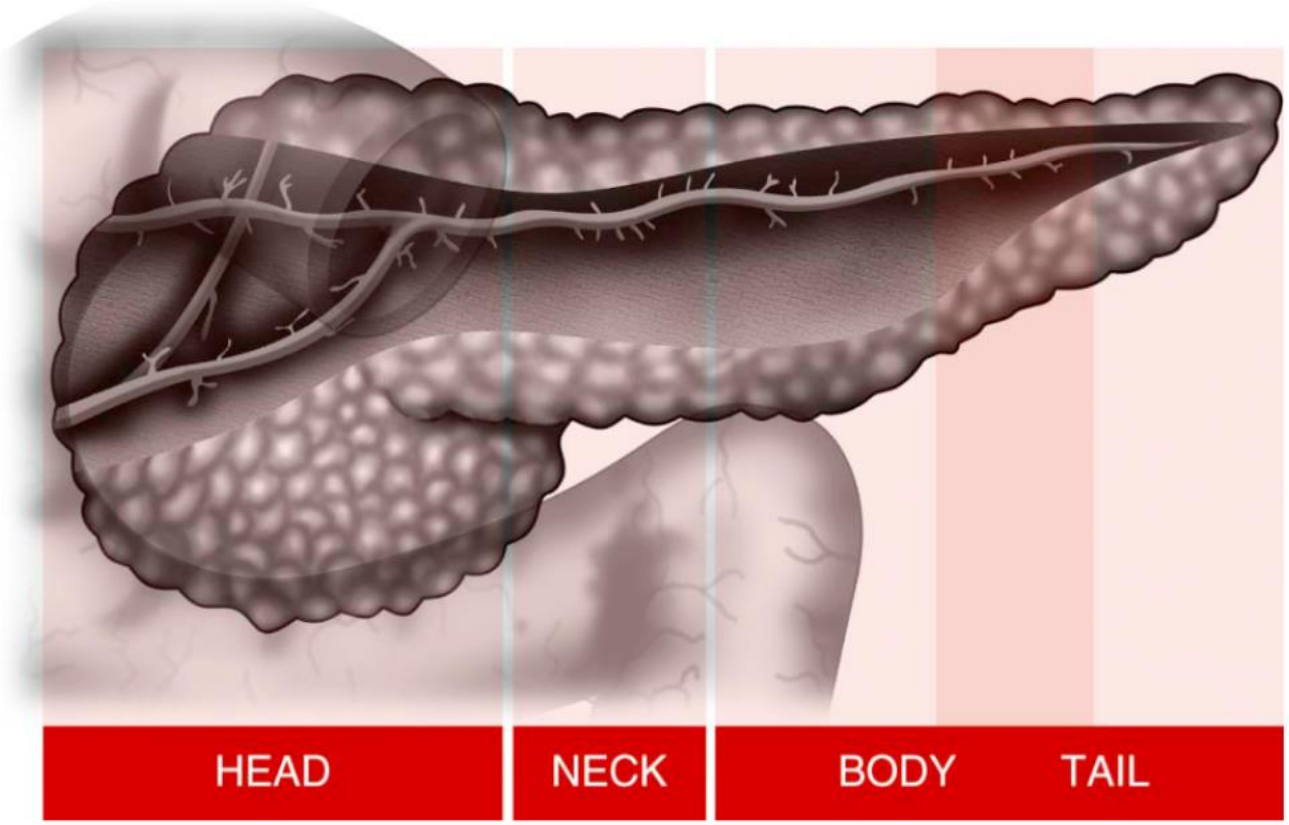
Scholar:

1. Review of some of the most recent seminal papers on topic

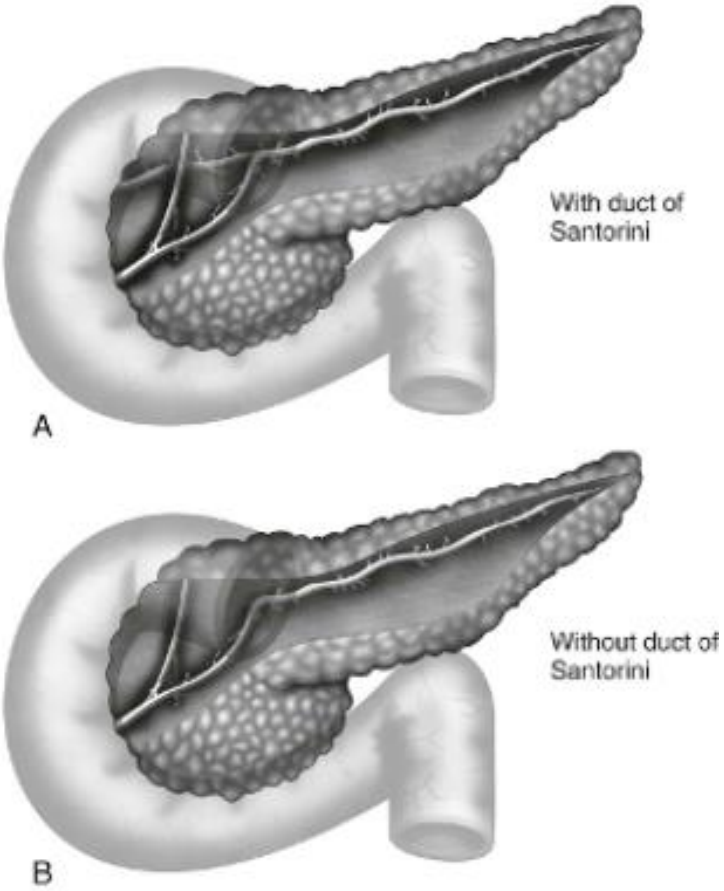
Anatomy


Left hepatic duct
Right hepatic duct
Cystic duct
Duodenum, superior part
Gallbladder
Neck
Body
Fundus
Accessory pancreatic duct
Common bile duct
Duodenum, descending part
Greater duodenal papilla
Circular folds
Duodenum, inferior part
Common hepatic duct
Pylorus
Pancreatic duct
Pancreas
Tail
Body
Head
Uncinate process

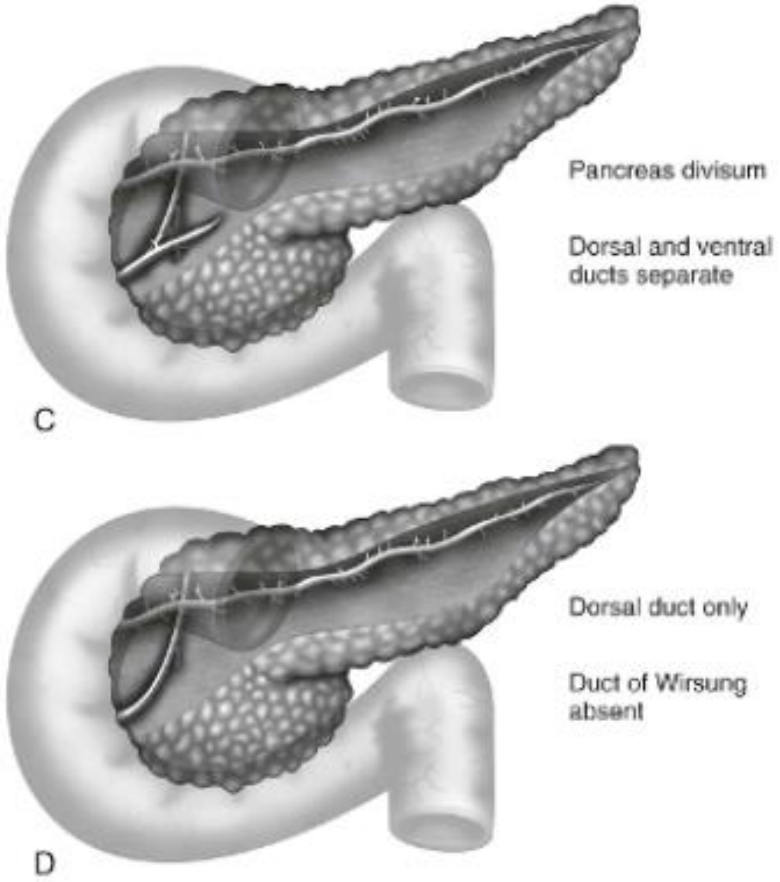
Anatomy



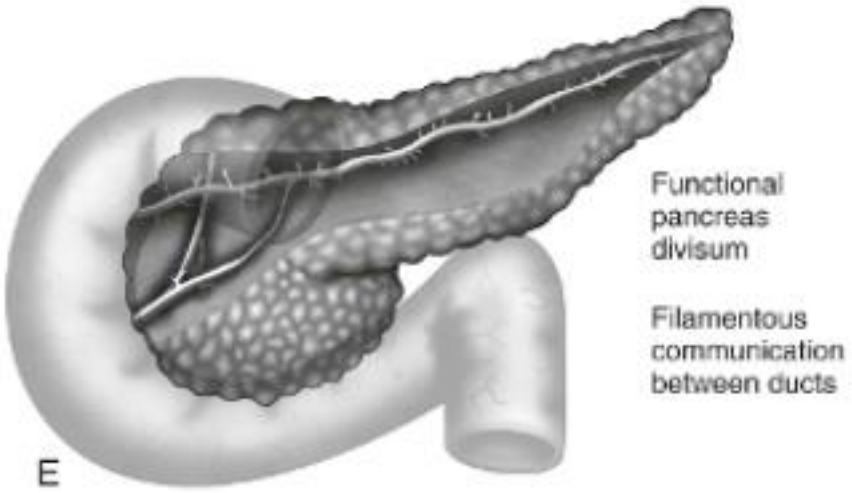
Normal Duct Anatomy



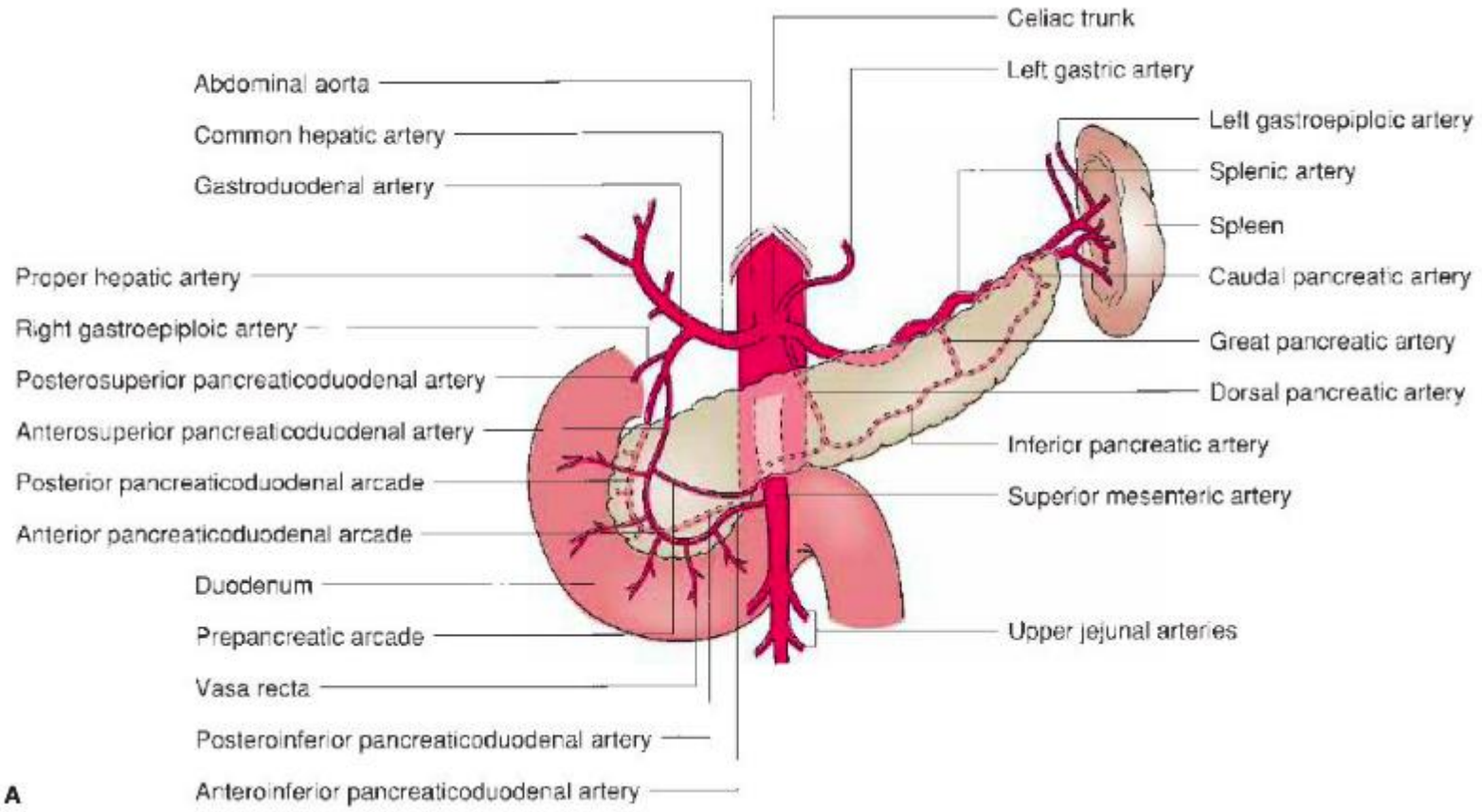
Abnormal Duct Anatomy



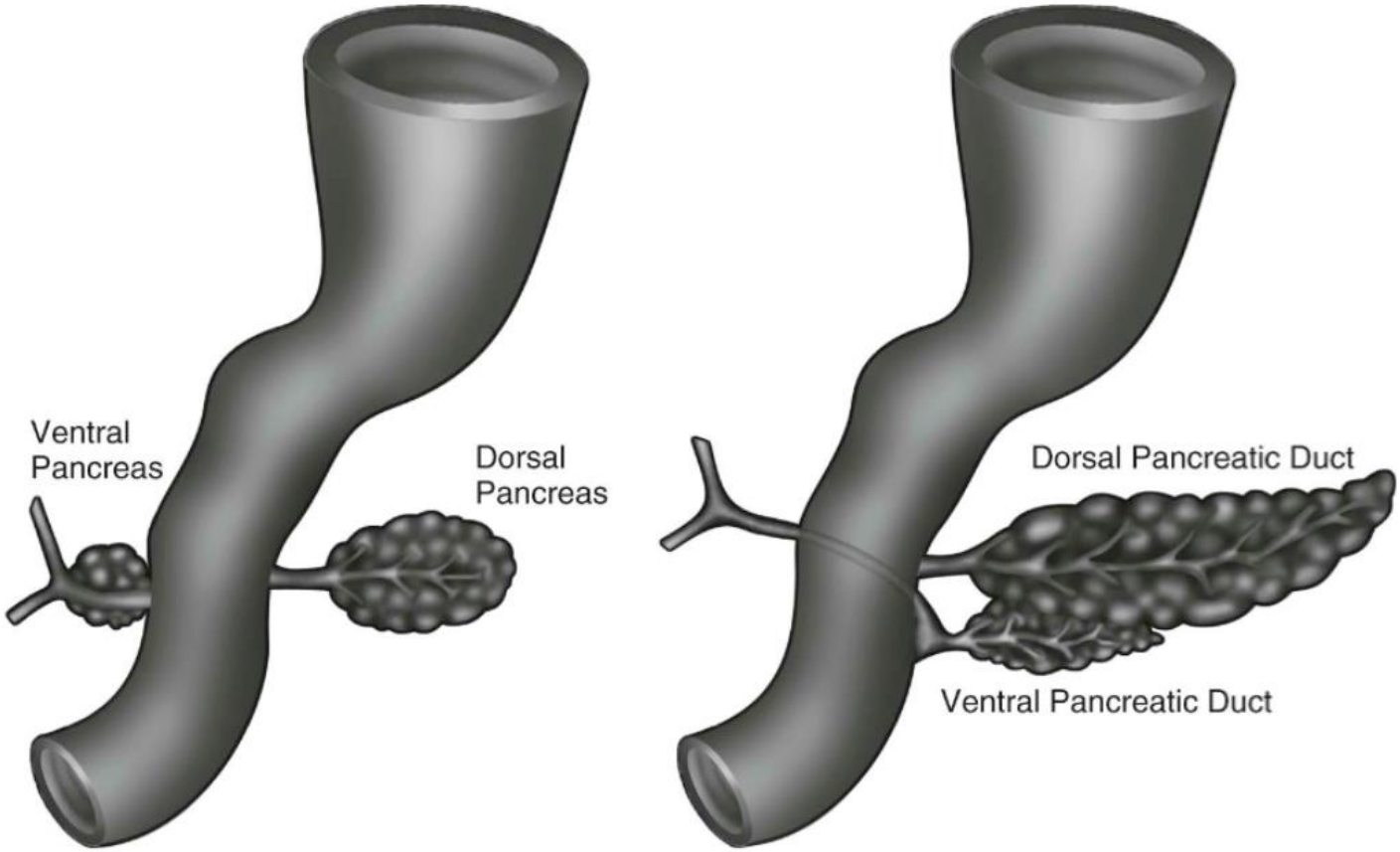
Abnormal Duct Anatomy



Arterial Anatomy

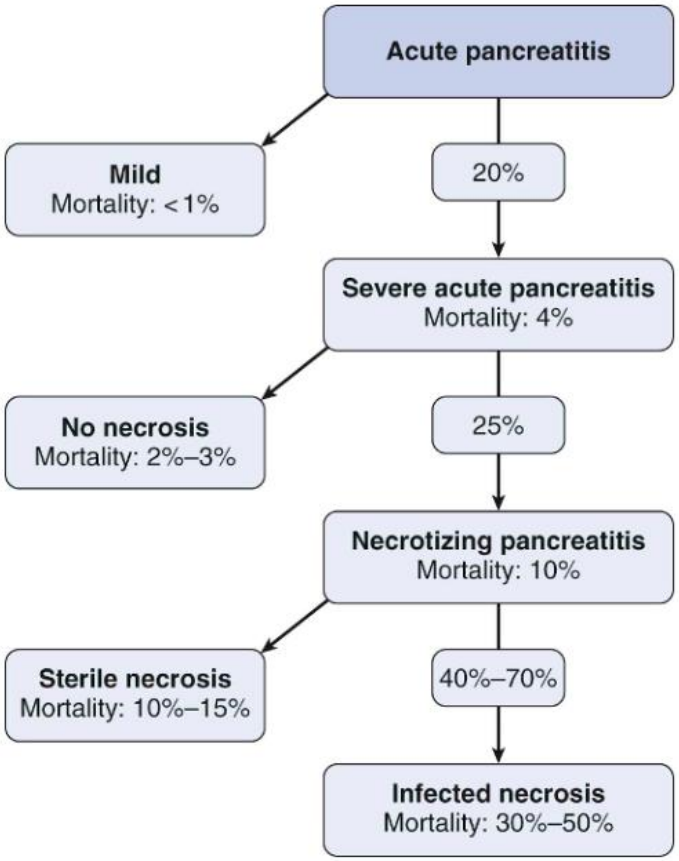


Embryology


Ventral
Pancreas
Dorsal
Pancreas
Dorsal Pancreatic Duct
Ventral Pancreatic Duct

Acute Pancreatitis

Disease Progression



Etiology

- Gallstone
- Alcohol
- Iatrogenic ERCP
- Hyperlipidemia
- Trauma
- … Infection (viruses), hypercalcemia, drugs, ischemia, malignant tumours, environmental toxins, scorpion venom, insecticides, idiopathic

Disease Course

- Early Phase
  - Inflammatory response, lasts ~ 1 week
  - The pancreatic edema and MOF resolve or progress
- Late Phase
  - Lasts weeks to months
  - Pancreatic ischemia and necrosis +/- infection

Assessment of Severity

- Clinical Criteria
  - Ranson's criteria
  - APACHE II
  - BISAP
  - Revised Atlanta Classification
- Radiological Criteria
  - Balthazar

Diagnosis

- Bloodwork
- Imaging
  - US
  - CT
  - MR/MRCP
  - EUS

Medical Management

- Supportive care the cornerstone of management
- Treatment of symptoms
- Prevention of complications

Volume Resuscitation

- Most important initial intervention
- After initial high-volume resuscitation, titrate urine to 0.5 cc/kg/hr
- Worsening hemo-concentration associated with higher likelihood of necrosis and MOF

Nutrition

- Make NPO to decrease pancreatic stimulation
- In mild/moderate disease, advance to oral diet within a week
- In severe disease, TPN should be started within 72 hours
    - Decreases complication rates to1/4 and mortality rates to 1/3

Nutrition

- Enteral nutrition preferred over TPN if possible
  - Preserves gut integrity and decreased infectious complications of pancreatitis
  - Use feeds rich in medium chain fatty acids
  - NG or NJ
- Probiotics now show higher risk of mortality

Analgesia

- PCA often used
  - Spasm of sphincter of Oddi
- Gradually weaned to NSAID

Prophylactic Antibiotics

- Mortality with infected necrosis up to 50%!
- No role in management
- Antibiotics reserved for patients where infection has been documented, or if on-going fever with leukocytosis

Management of Complications

- Infection of pancreatic necrosis one of the primary indications for intervention
- Traditionally, open necrosectomy
- Several new techniques available
- Delay surgery for at least 3-4 weeks

Step-Up Approach

- Percutaneous drainage
- Endoscopic necrosectomy
- Video-assisted retroperitoneal debridement
- Laparoscopic surgical necrosectomy
- Open surgical necrosectomy

Percutaneous Drainage

- Stabilize patients in the 3-4 weeks prior to definitive surgery
- Aim is to reduce the source of infection and not evacuate all infected tissues
- Drawback involves repeat procedures (upsize, re-position, drainage of new collections)
- Contraindicated in extensive solid necrosis

Endoscopy (NOTES)

- Transgastric or transduodenal necrosectomy
- Endoscopic-ultrasound guided
- Less invasive and can be used in poor surgical candidates
- Best for necrosis involving the lesser sac
- Drawbacks include repeat procedures and high risk of bleeding (up to 30%)

Retroperitoneal Debridement

- VARD
- Utilized if lack of clinical improvement with percutaneous drainage
- 5 cm left flank incision
- Follow path of percutaneous drain to pancreas
- Debride using suction and graspers
- Follow by CO_2 insufflation and further debridement under direct visualization

Retroperitoneal Debridement

- Irrigate the wound and leave 2 large bore drains
- Continuous irrigation with normal saline
  - 10L/24 hours

Laparoscopic Necrosectomy

- Transgastric approach using anterior and posterior wall gastrostomies
- Suction, debride, and irrigate
- Shorter length of stay

Open Necrosectomy

- Midline or left subcostal incision
- Enter lesser sac
- Drainage methods include…
  - 1) Closed packing
  - 2) Open packing
  - 3) Planned repeat laparotomy
  - 4) Continuous irrigation of hte lesser sac

Closed Packing

- Pack debrided area with gauzed-filled penrose drains
- Reoperation rates 15% and morality 4-6%

Open Packing

- Historical
- Rarely used as morbidity and mortality 73%
- Reserved for patients where intervention was necessary early

Repeat Laparotomy

- Reserved for patients where intervention was necessary early
- Morbidity 78%, mortality 17%, bleeding 26%

Chronic Pancreatitis

Chronic Pancreatitis

- Chronic inflammation of the pancreas
- Characterized by…
  - Chronic abdominal pain
  - Endocrine insufficiency → Diabetes
  - Exocrine insufficiency → Fat Malabsorption

Causes

- Alcohol
- Anatomic
- Genetics

Diagnosis

- X-Ray
  - Intraductal calcifications in 30-50% of patients
- CT/MRI/MRCP
  - Beading of the main pancreatic duct with side branch ectasia
- ERCP

- EUS

Diagnosis

- ERCP
  - Cambridge Classification
- EUS
  - Can detect earliest changes in pancreatitis
  - FNA

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Medical Management

- Specialized centres
  - GenSx, GI, IR
- Stop all EtOH intake
- Smoking cessation
- Pancreatic enzyme supplements
  - Lipase 30,000 IU qMeal

Endotherapy

- ERCP
  - Pancreatic stents for strictures
  - Removal of stones
- Extracorporal shock wave lithotripsy

Endotherapy

- 2/3 of patients experience improvement in pain
- Most failures are due to recurrence of stricture after stents removed
- Outcomes worse if pancreatic stones present

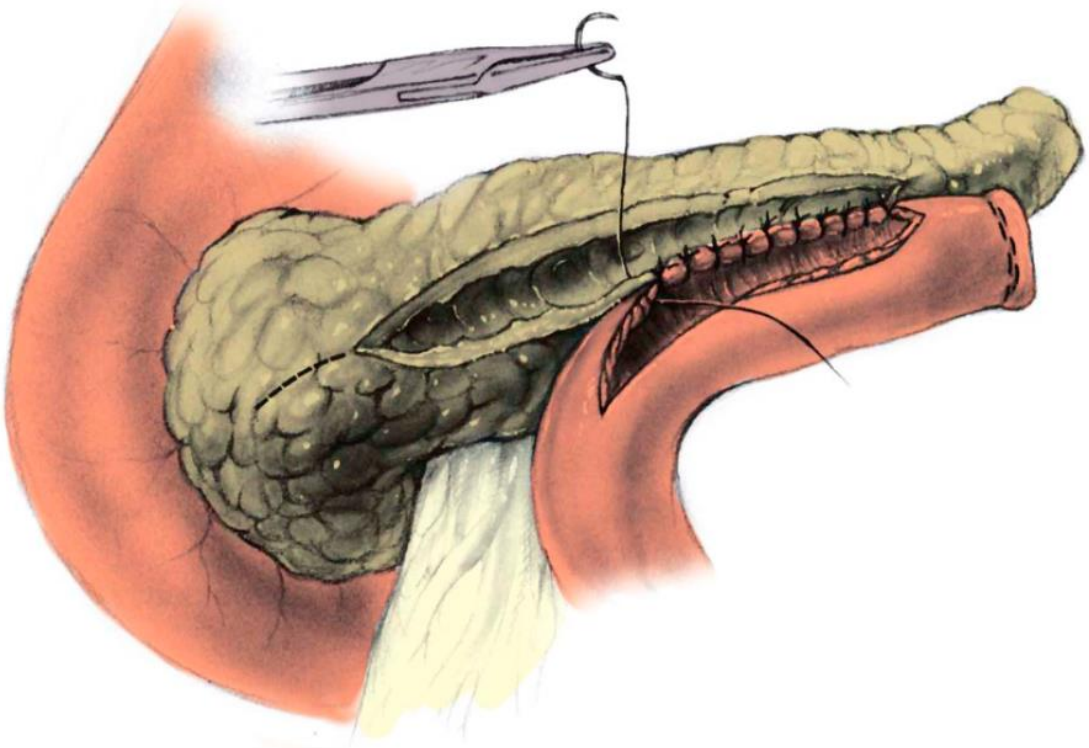
Surgery

- Patients taken early for surgery had less hospitalizations, repeat procedures, and better pain-relief
- Goal is pain-relief and relief of functional impairment

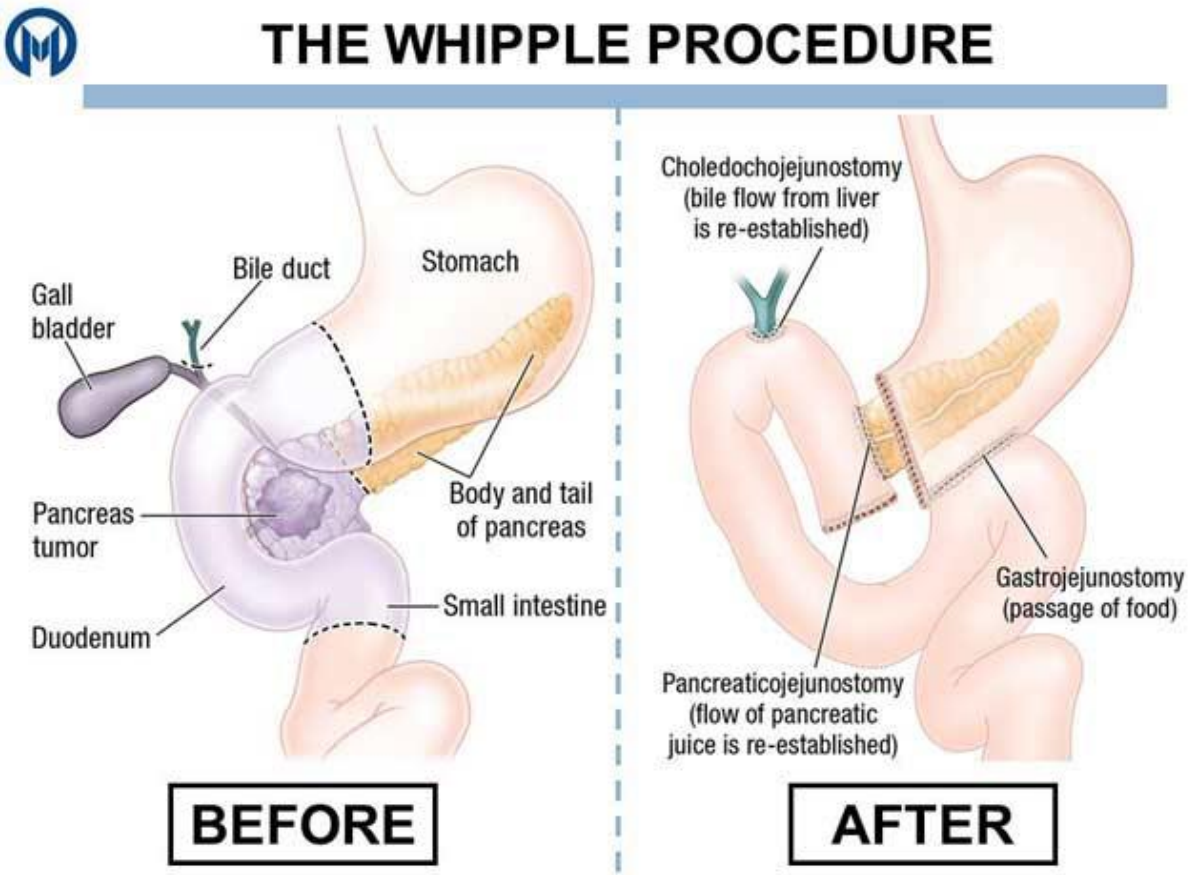
Surgery

- Drainage Procedures – for dilated ducts
  - Puestow
- Resection – for dilated duct and diseased pancreas
  - Whipple's
  - Beger
  - Frey
  - Distal/Total Pancreatectomy

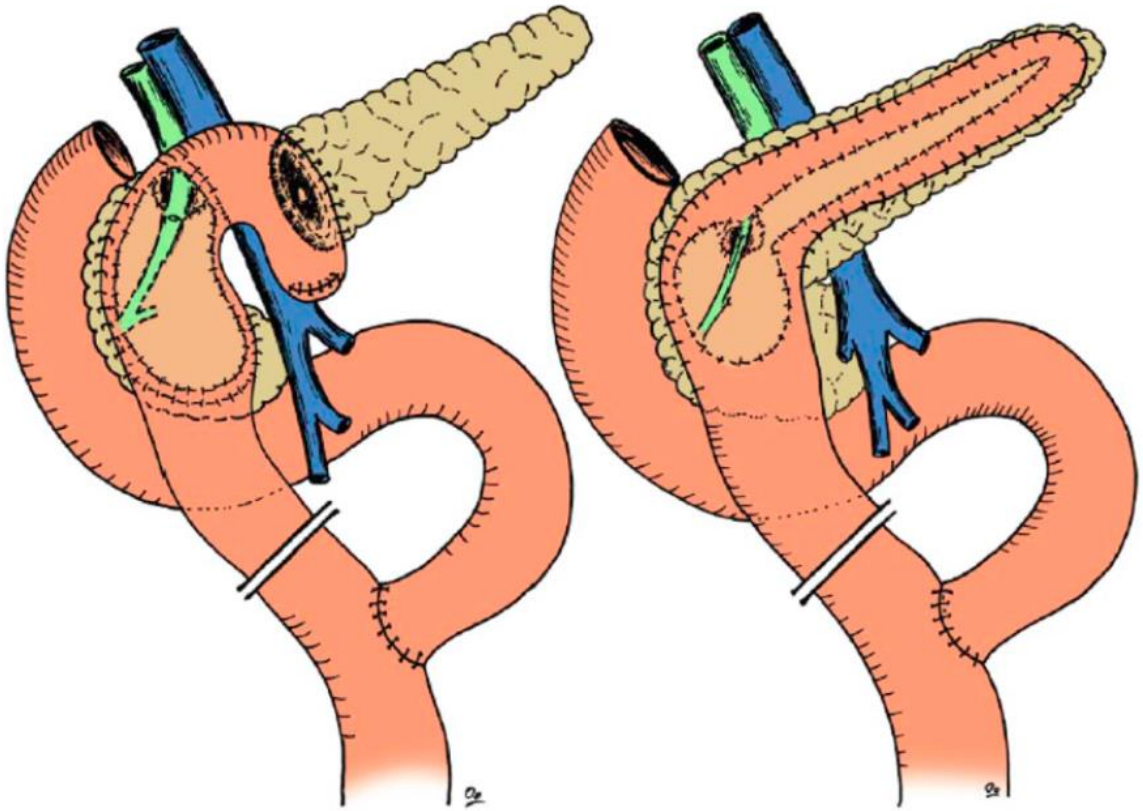
Puestow Procedure



Whipple's Procedure



Beger and Frey Procedure



Frey Procedure