EVIDENSIA
SPECIALISTDJURSJUKHUSET
STRÖMSHOLM

PANCREATIC SURGERY

Susanne Åkerblom
Chief of Surgery
Swedish Specialist in Surgery (Small Animal)

ANATOMY

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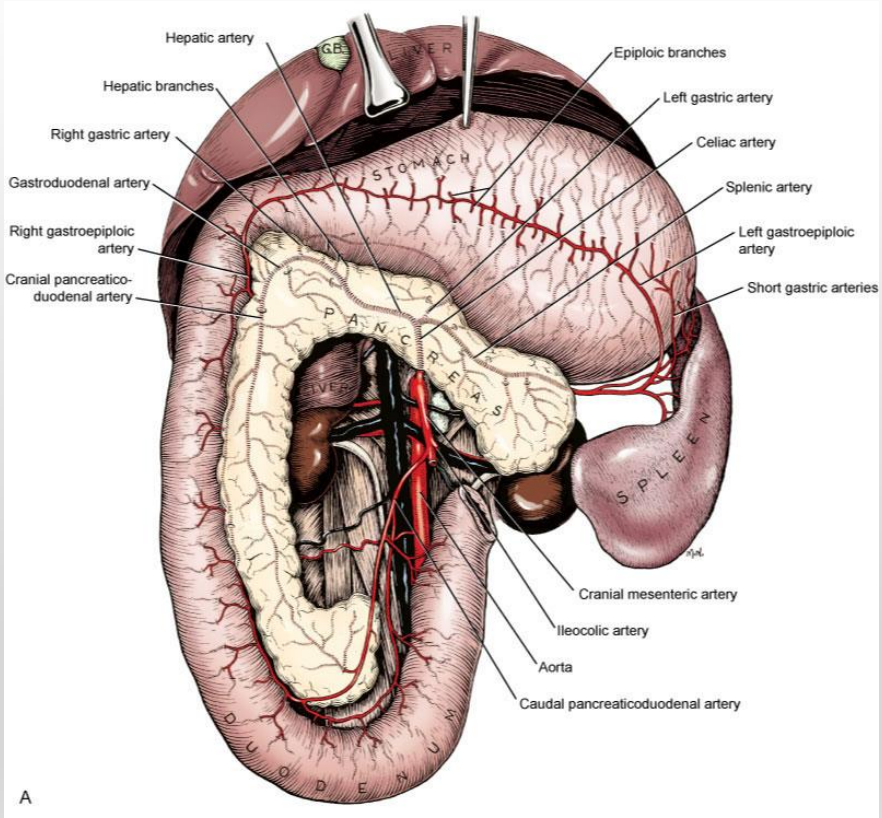
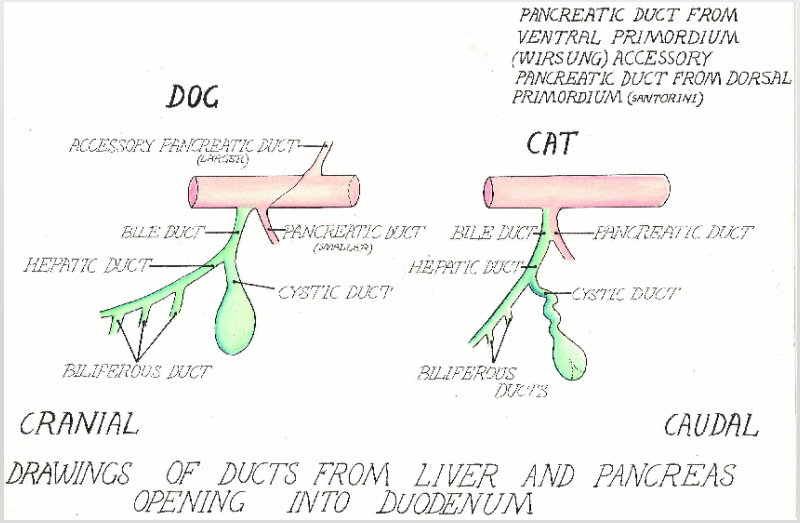
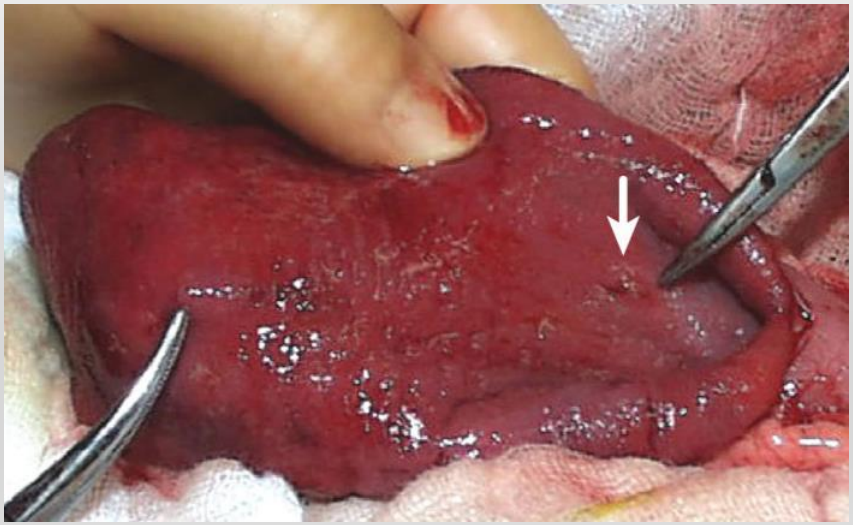
- Consist of right limb, left limb and central body
- Vasculary supply:
  - splenic artery
    - (left limb)
  - hepatic artery
    - (body, proximal right limb)
  - caudal pancreaticoduodenal artery
    - (distal right limb)



- 68% of dogs only the accessory pancreatic (Santorini) duct
  - Minor duodenal papilla
- 32% also the pancreatic (Wirsung) duct
  - Major duodenal papilla
- 80% of cats single pancreatic duct that fuses with the bile duct
  - Major duodenal papilla



DRAWINGS OF DUCTS FROM LIVER AND PANCREAS OPENING INTO DUODENUM



ANAESTHETIC CONSIDERATIONS

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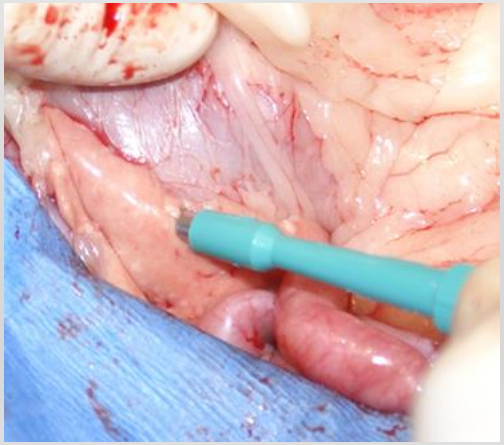
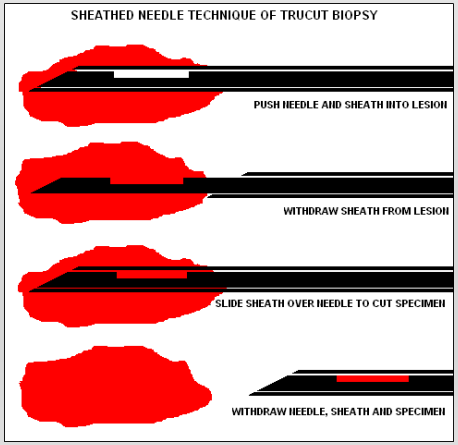
- Primarily related to underlying conditions
- Blood glucose should be monitored every 15 to 30 minutes
- Premedication with α_2-agonists should be avoided

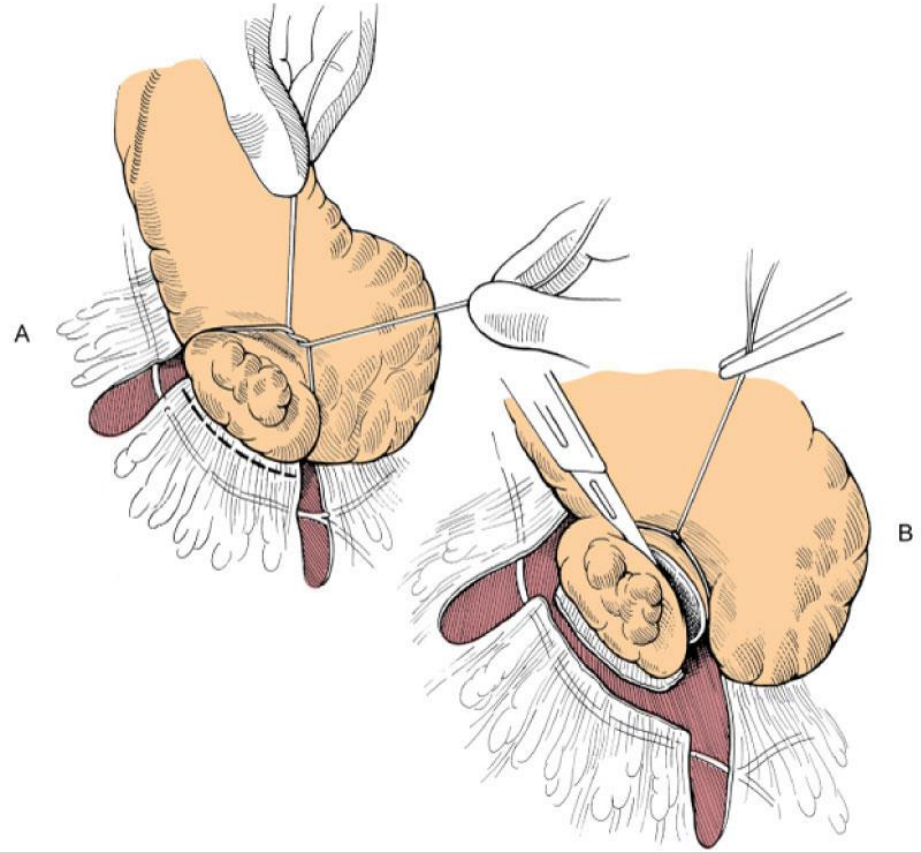
PANCREATIC BIOPSY

- Distal aspect of right limb
  - Scalpel (wedge) or punch biopsy
  - Tru-Cut or similar
  - Suture fracture technique
  - Blunt dissection and ligation
  - Laparoscopic technique





Suture fracture technique

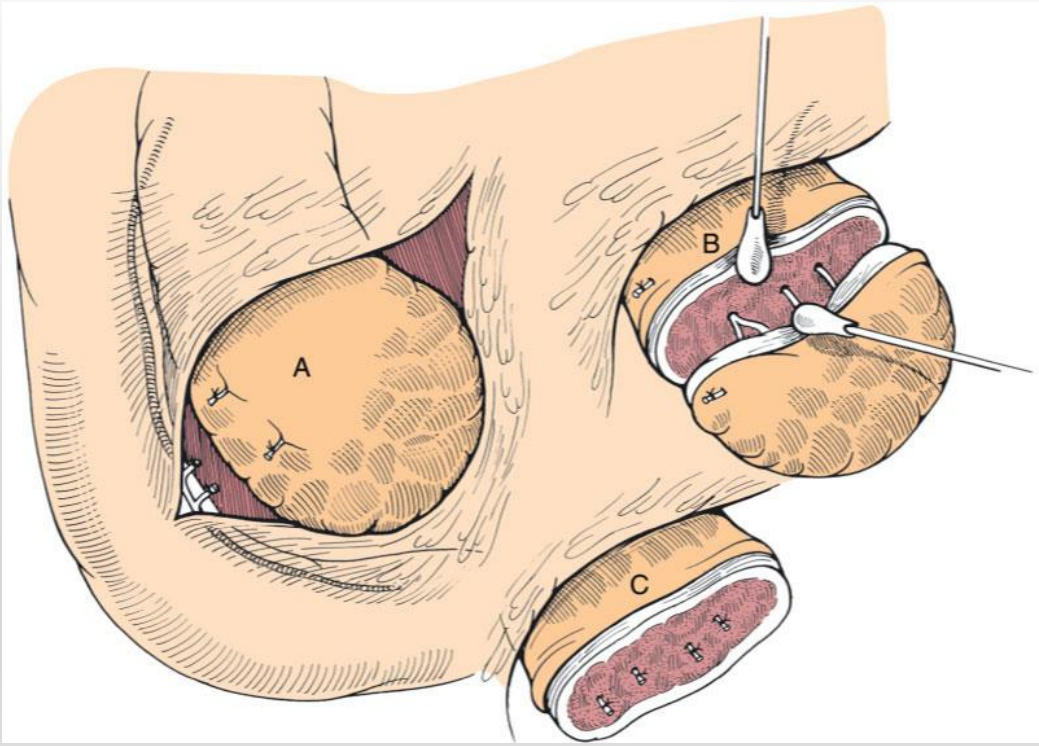


- Mesoduodenum is incised
- Non-absorbable suture passed proximal to the biopsy area
- Tissue distal to ligature is excised

Blunt dissection and ligation

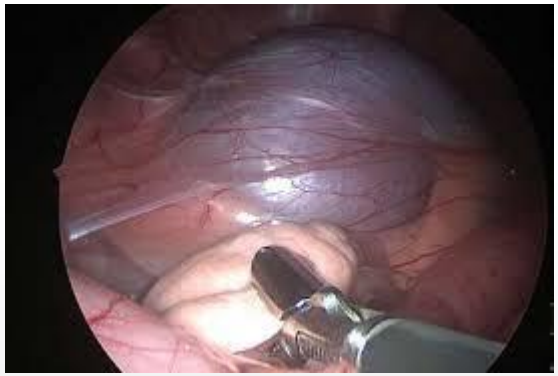
- Can be used on any region of the pancreas
- In proximal portion of the right limb or the body avoid damage to pancreaticoduodenal vessels

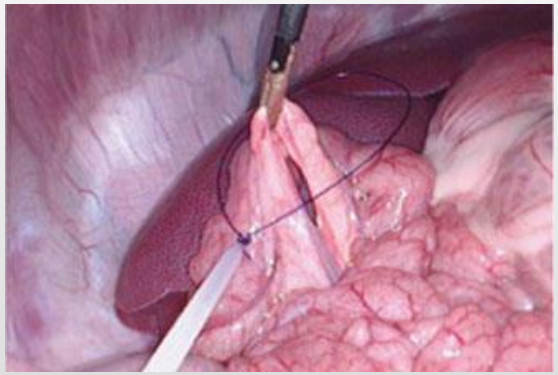
- Mesoduodenum is incised
- Blunt dissection between lobules with hemostat or cotton swab
- Vessels and ducts are ligated and transected

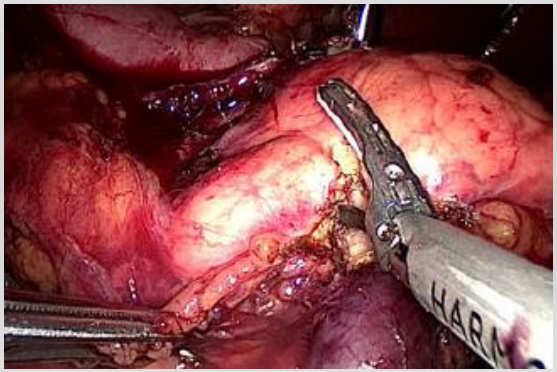


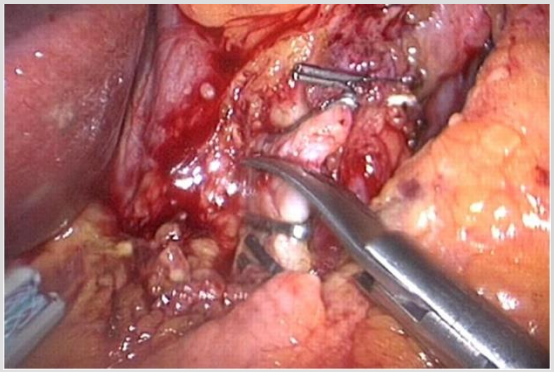
Laparoscopic technique

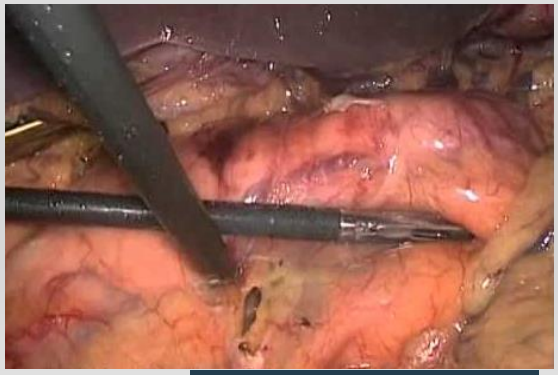
- Several possibilities
  - 5 mm cup biopsy forceps
  - Pretied loop ligature
  - Vessel-sealing device
  - Hemostatic clips
  - Harmonic scalpel











Effects of open pancreatic biopsy

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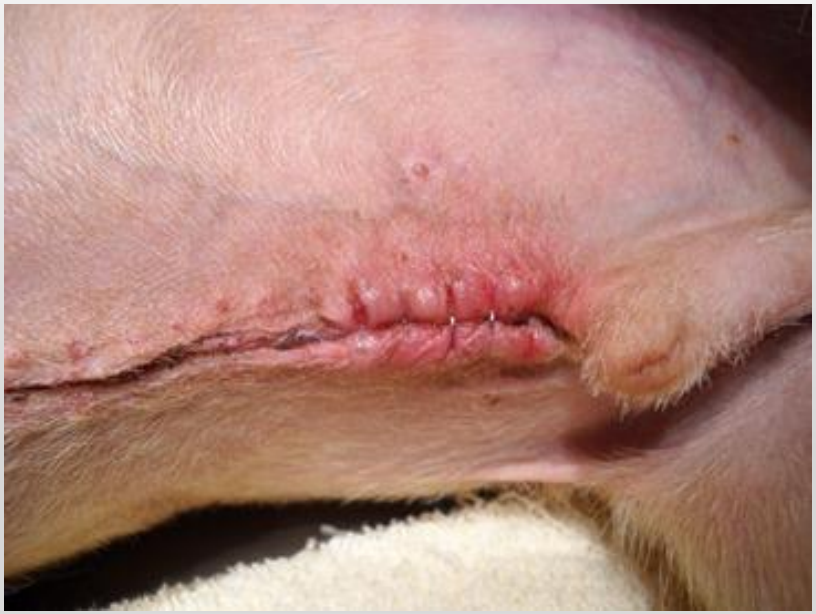
- Injury to the pancreas occurs with any pancreatic procedure
- Suture fraction technique and blunt biopsy comparable

- Complications
  - Pain on abdominal palpation
  - Pyrexia
  - Swelling at abdominal incision
  - Vomiting



PARTIAL PANCREATECTOMY

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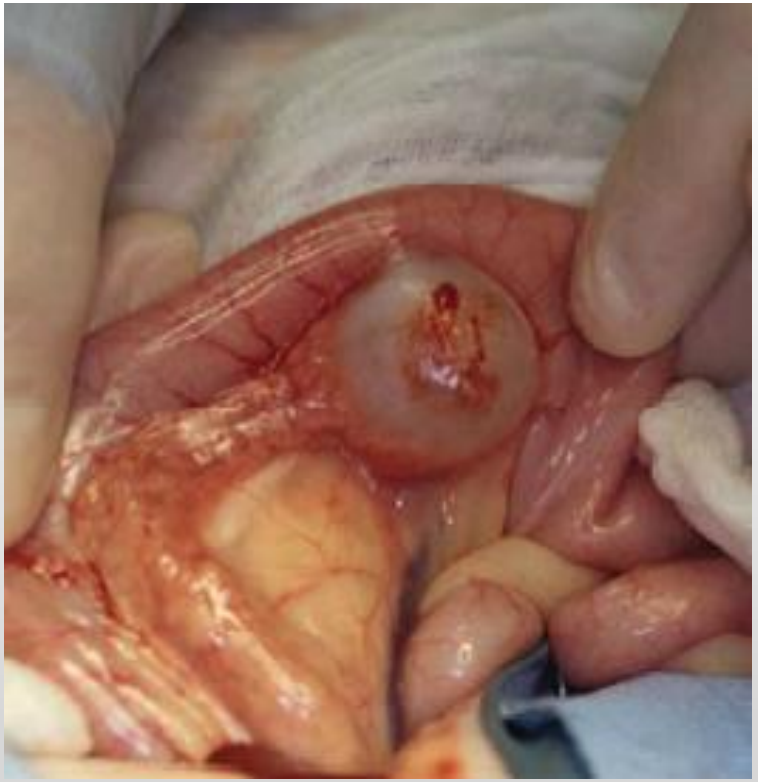
- Indications
  - Focal trauma
  - Isolated neoplasia
  - Pseudocyst
  - Abscess

- Suture fraction technique
- Blunt dissection and ligation
- Stapling techniques

- 75-90% can be resected providing that the duct to the remaining portion is left intact



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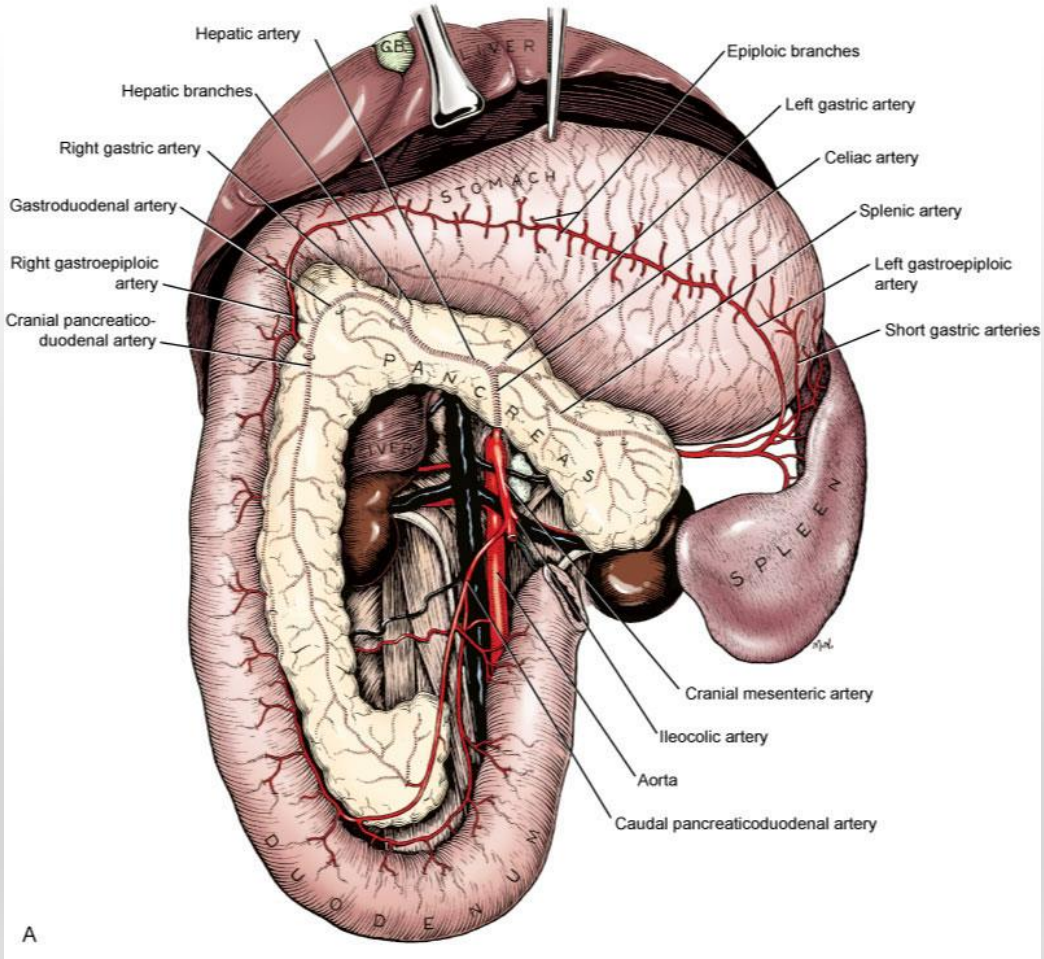
- Obstruction of the splenic artery requires splenectomy
- Important to preserve pancreaticoduodenal artery



TOTAL PANCREATECTOMY

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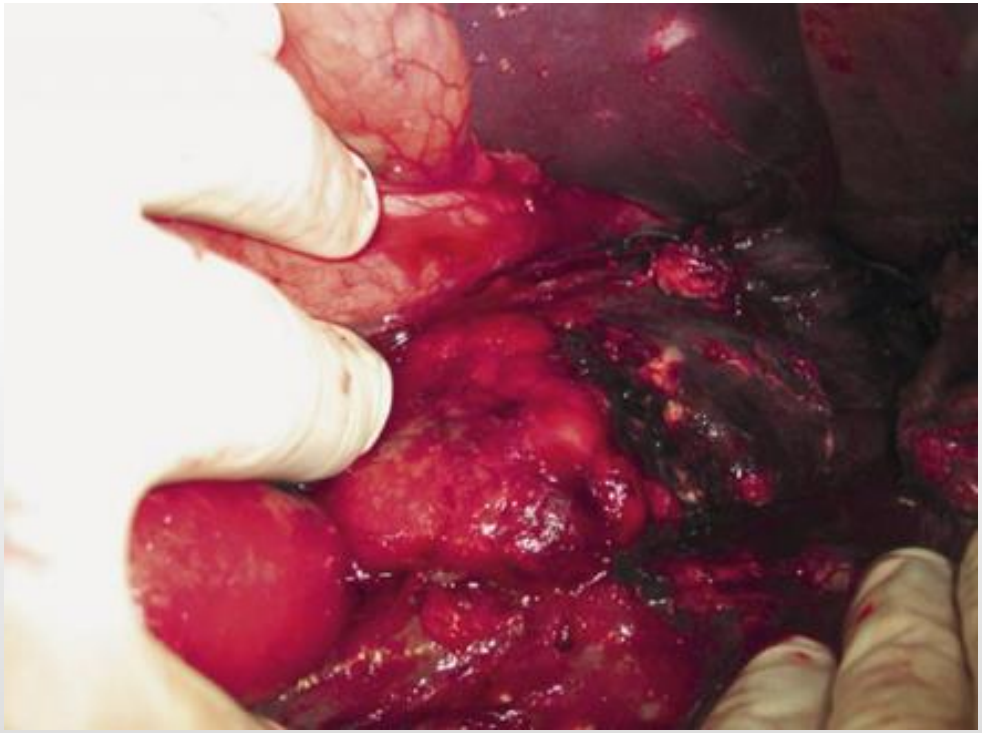
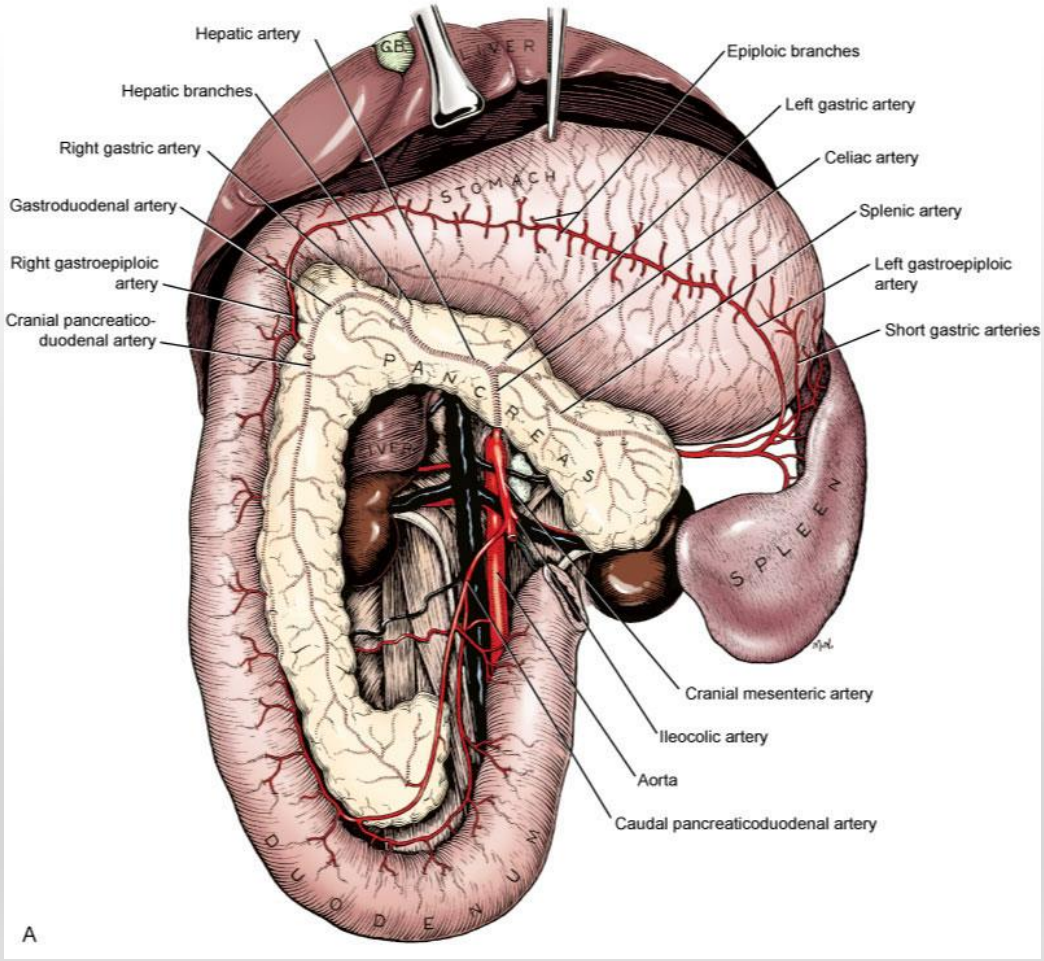
- Indications
  - Acute trauma
  - Intractable pancreatitis
  - Severe chronic fibrosis



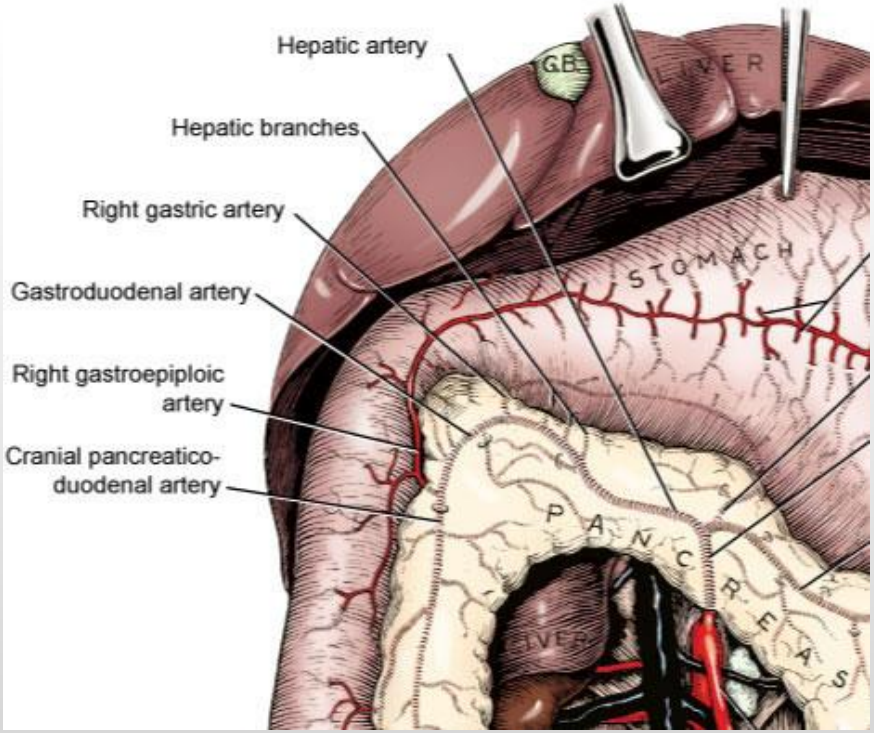
- NOT indicated for pancreatic carcinoma

- Important to preserve the shared blod supply to the duodenum

- Open ventral leaf of omentum to expose the pancreas
- Start with left limb
- Identify and ligate branches of splenic artery
- Obstruction of the splenic artery requires splenectomy



- Continue towards body
- Identify and ligate branches of hepatic and gastroduodenal arteries
- Important to preserve the gastroduodenal artery and cranial pancreaticoduodenal artery at the angle of the pancreas



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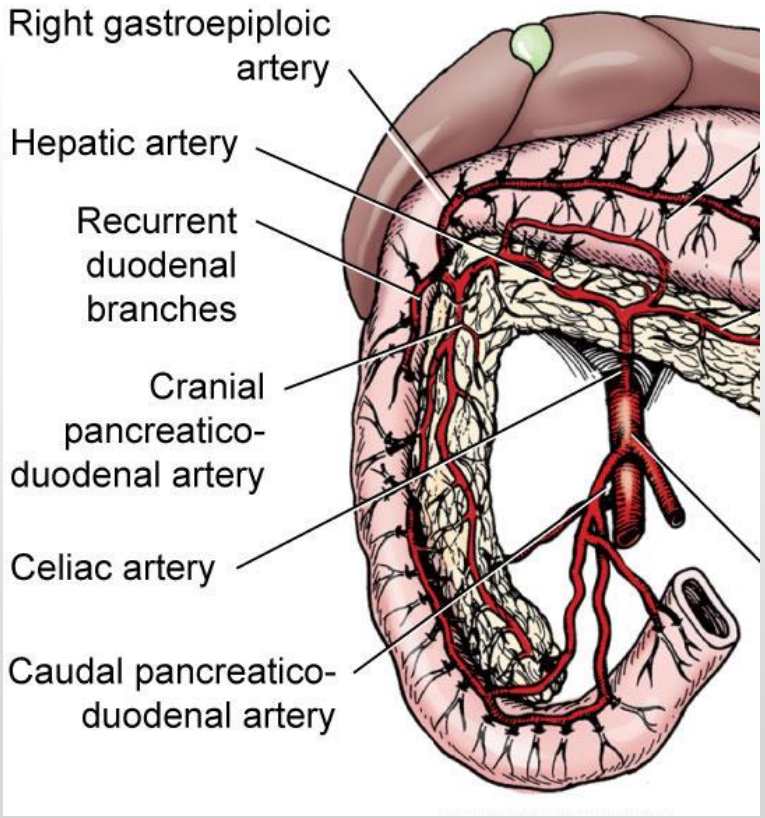
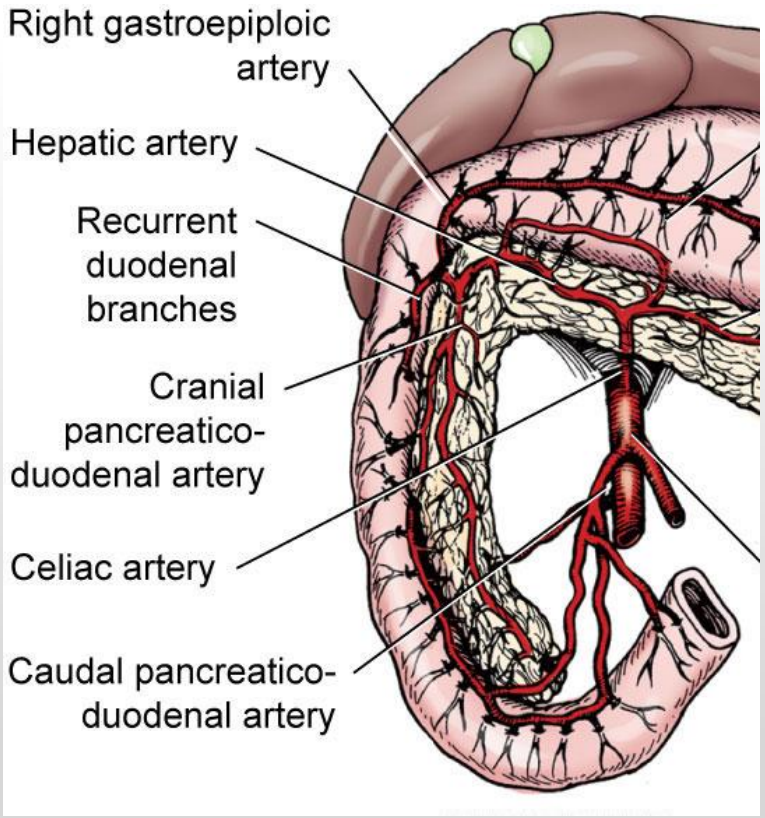
- Start dissection at distal end of right limb
- Identify and ligate branches of the caudal pancreaticoduodenal artery
- Important to preserve the pancreaticoduodenal artery itself

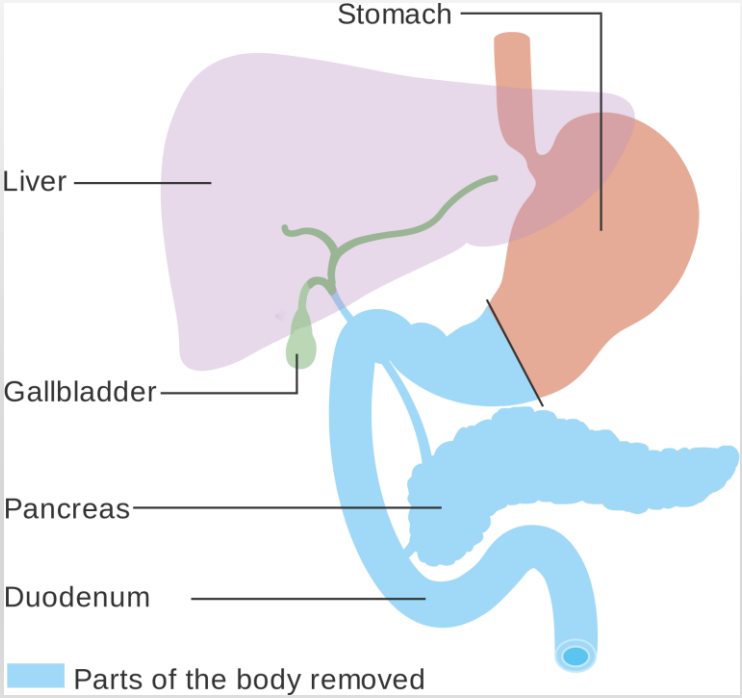


- Three possible methods to remove the reminder of the right limb:
  - Avulsion technique by blunt dissection of pancreatic tissue from the pancreaticoduodenal vessels
  - Preservation of the recurrent duodenal branch of the right gastroepiploic artery
  - Ligating and transecting the communication between cranial and caudal pancreaticoduodenal arteries near caudal duodenal flexure
- Pancreatic ducts are transected without ligation



PANCREATICODUODENECTOMY

- Indicated when preservation of duodenal blood supply is not possible
- High morbidity and mortality
- Combines total pancreatectomy with excision of duodenum and pylorus



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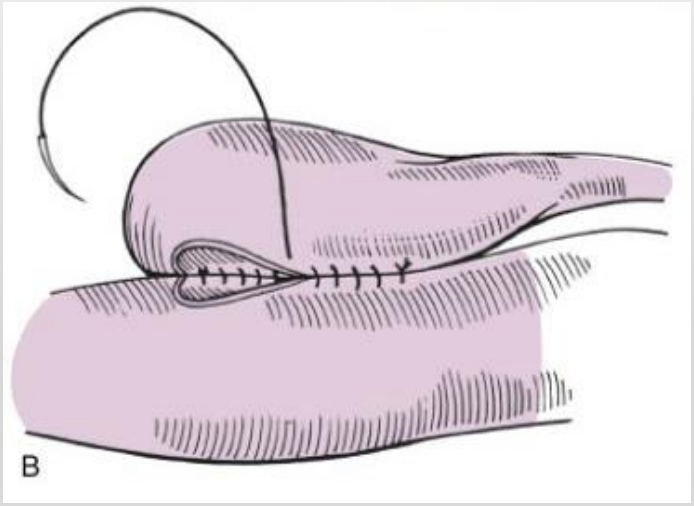
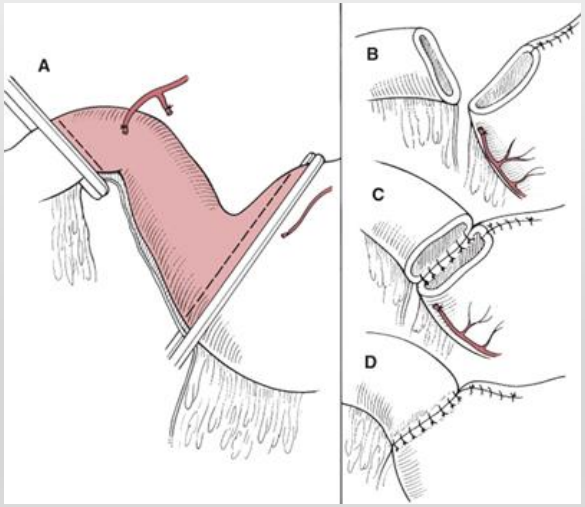
- The duodenum is resected at the level of the distal end of the pancreas
- The bile duct is ligated and transected where it enters the duodenum
- Cholecystoenterostomy is required
- Gastroenterostomy is required





PANCREATIC DRAINAGE

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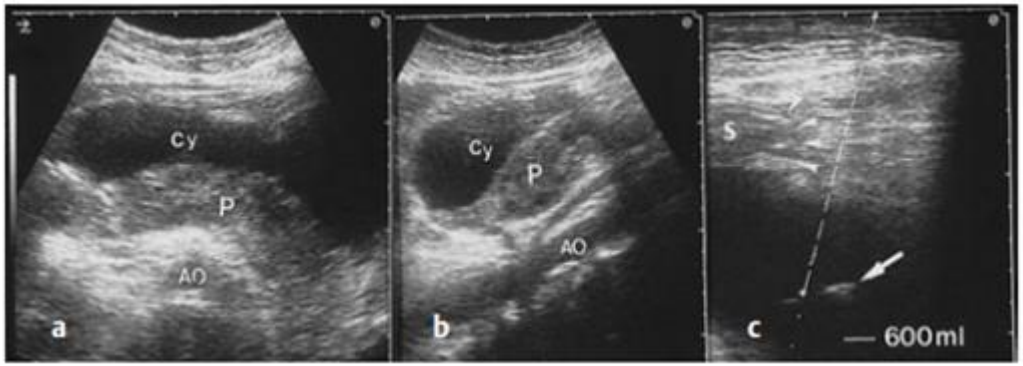
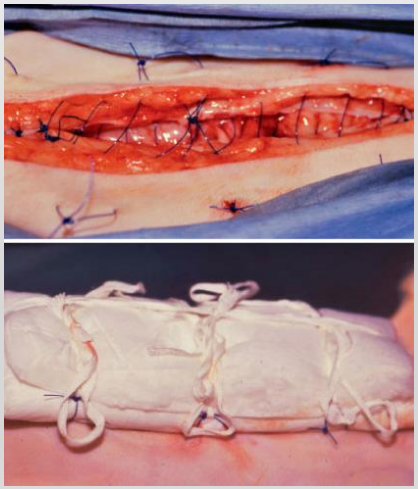
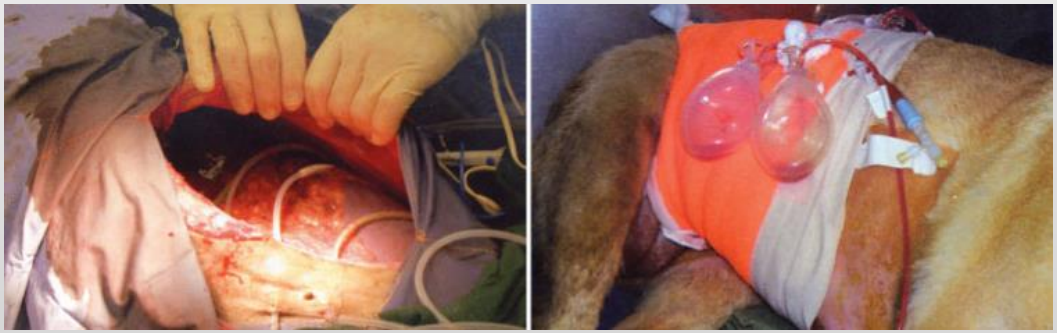
- Pancreatic pseudocysts
  - Ultrasound-guided aspiration
- Pancreatic absess
  - Open abdominal drainage
  - Closed drainage







POSTOPERATIVE CARE

- Pancreatitis the most common complication
- Food is withheld first 24 hours postoperatively
  - diet low in fat and protein
- Electrolyte and fluid balance monitored closely
- Analgesia
  - opioids, methadone-ketamine-lidocaine CRI
- Antiemetics
  - metoclopramide
- Reduction of gastric acid production
  - ranitidine, famotidine
- Nutritional support may be necessary
  - feeding tube, parenteral nutrition

PANCREATITIS

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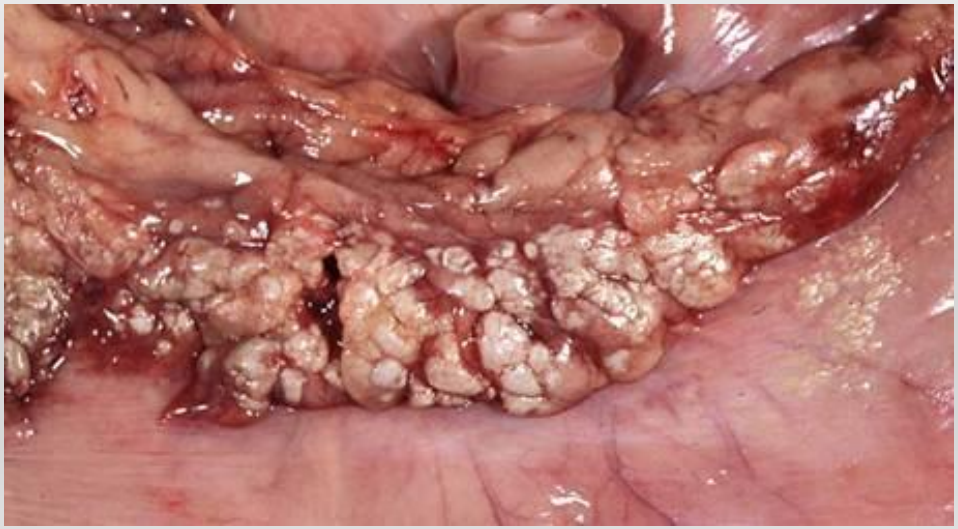
- The most common disease of the exocrine pancreas
- Pathogenesis, risk factors and underlying causes poorly defined
- Acute pancreatitis
  - Sudden onset, reversible
- Chronic pancreatits
  - Continuous, often subclinical, irreversible
- Secondary to surgery



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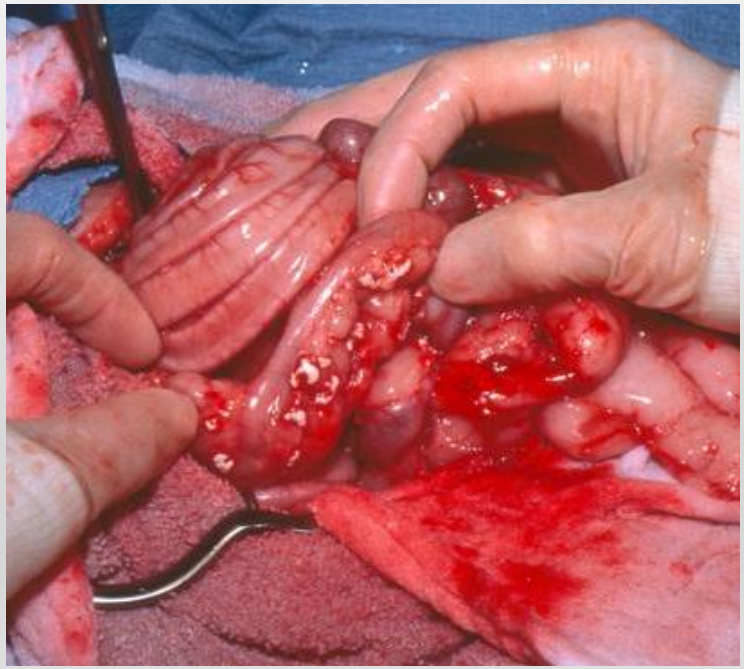
- Surgery remains controversial
- Indications:
  - Biliary obstruction
  - Pancreatic abscess
  - Confirmation of diagnosis
  - Poor response to medical treatment
  - Evidence of infection
- Procedures:
  - Biopsy
  - Cholecystoenterostomy
  - Pancreatectomy
  - Abdominal lavage
- Overall survival rate after surgery 63%



PANCREATIC ABSCESS

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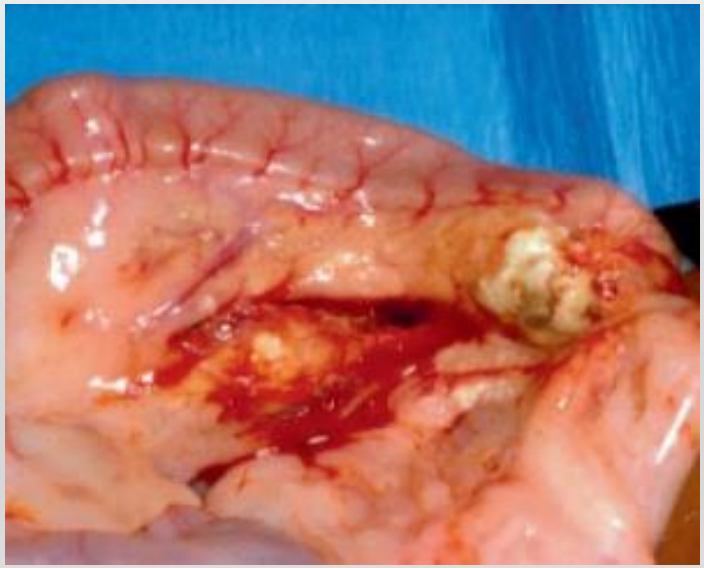
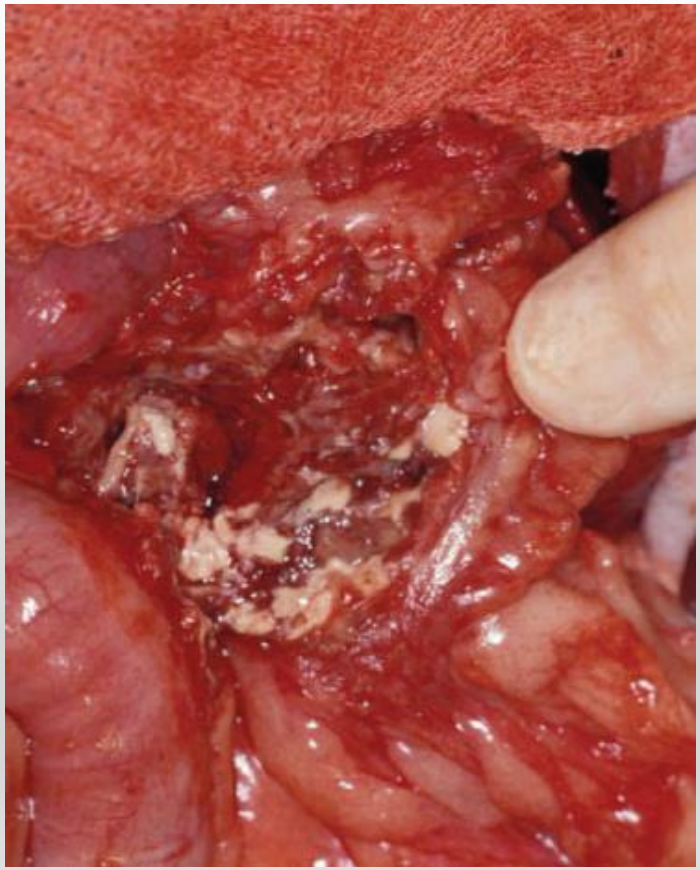
- Usually sequela to pancreatitis
- Defined as a collection of pus and necrotic tissue within the pancreas or extending from the pancreas into the adjacent tissues
- Most abscesses are sterile
- Ddx neoplasia and pseudocysts



- Surgery based on location and involvement of surrounding tissues
- Procedures:
  - Debridement
  - Partial pancreatectomy
  - Biopsy
  - Cholecystoenterostomy
  - Drainage
  - Omentalization
  - Duodenal resection and anastomosis



- Bacterial culture usually essential, but often negative
- Overall survival rate after surgery 14-55%

PANCREATIC PSEUDOCYSTS

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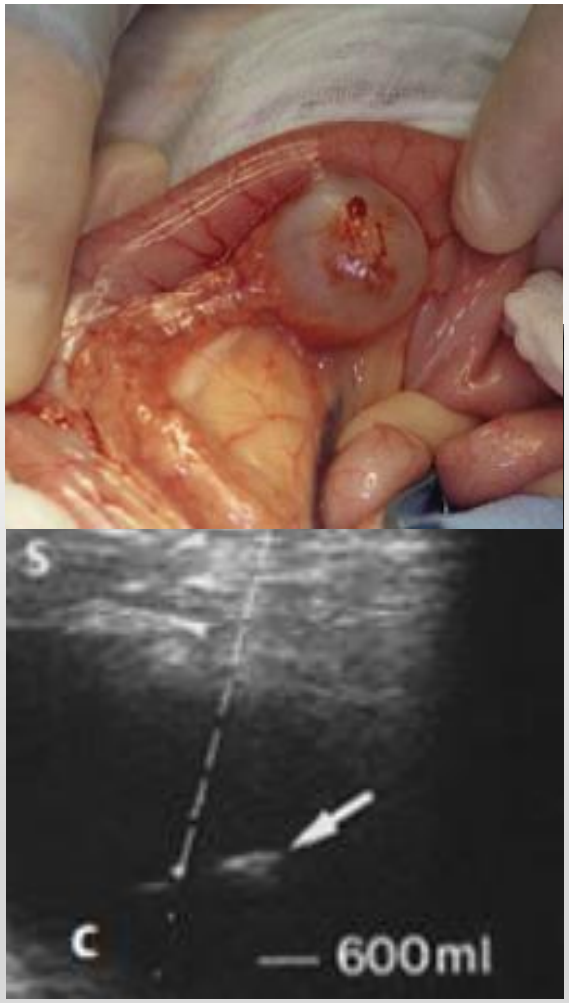
- Collection of pancreatic secretions and debris within a nonepithelialized sac
- Usually sterile
- Pathogenesis unclear



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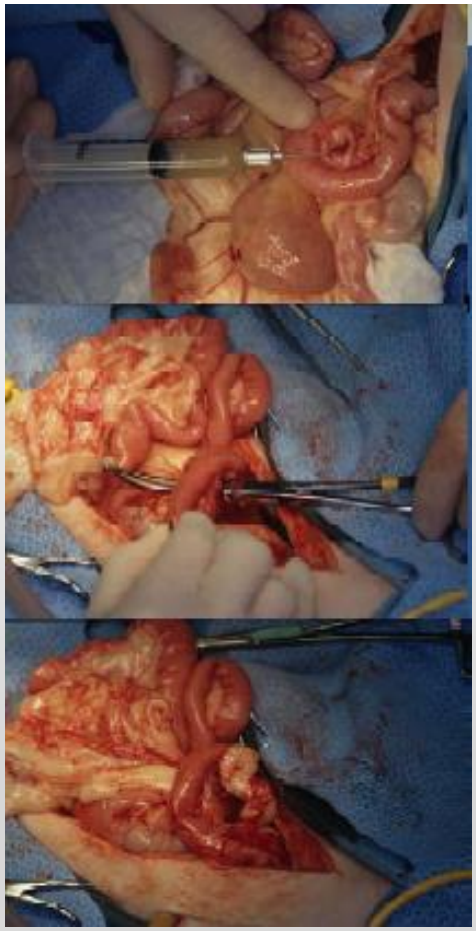
- Single cysts monitored by ultrasound
- Ultrasound-guided aspiration
- Indications:
  - Clinical signs persists after aspiration
  - Cyst enlarges
  - Cyst fails to resolve
  - Percutaneous aspiration impossible
  - Recurrence of cyst
  - Pancreatic duct obstruction
- Procedures:
  - Cystoenterostomy
  - Cystogastrostomy
  - Omentalization
  - Cholecystoenterostomy
  - Partial pancreatectomy
  - Excision and drainage
- 75% success rate despite incomplete drainage



EXOCRINE PANCREATIC TUMOUR

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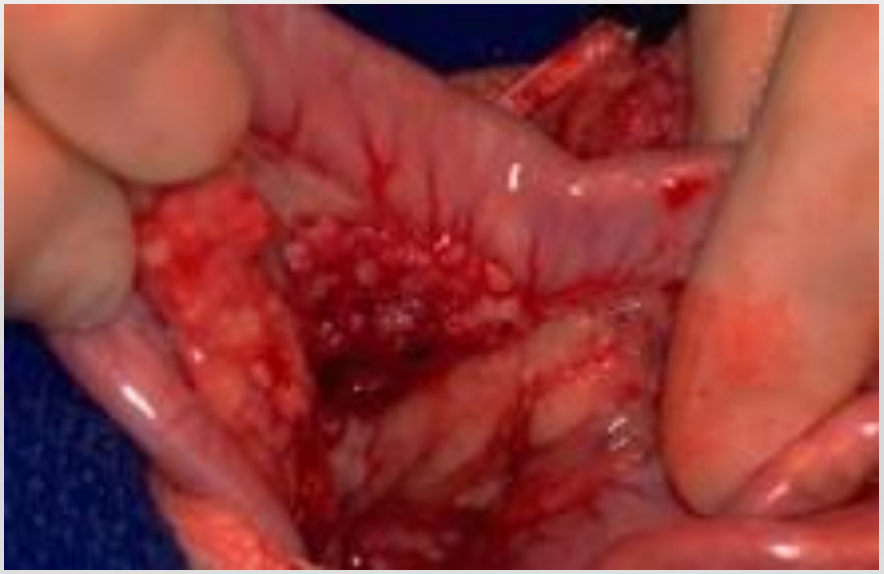
- Most commonly carcinoma of epithelial origin
- Highly metastatic (regional lymph nodes, liver)

- Procedures:
  - Total pancreatectomy
  - Pancreaticoduodenectomy
  - Gastrojejunostomy

- Extremely poor prognosis



INSULINOMA

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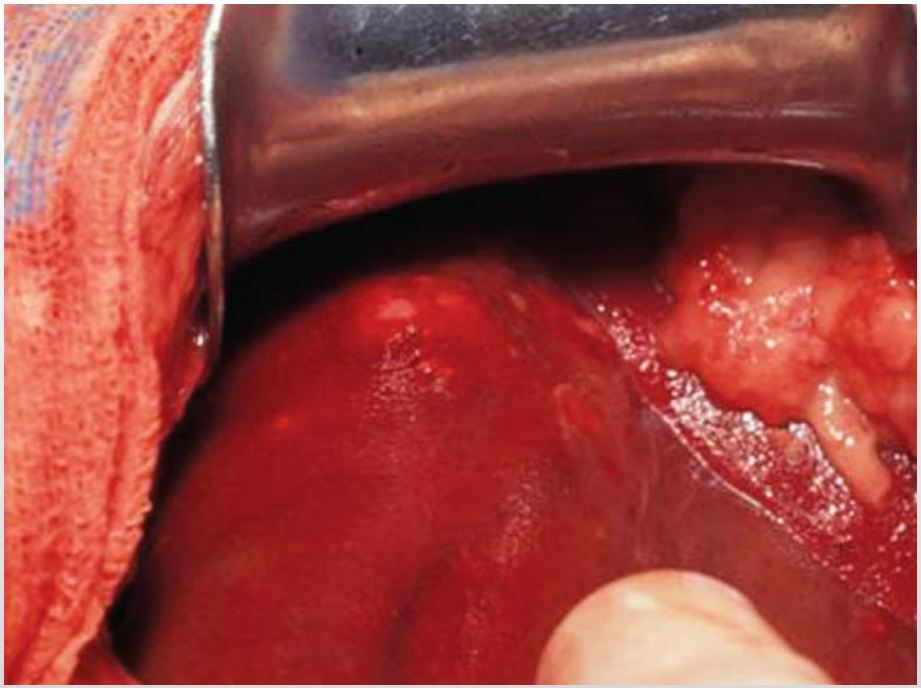
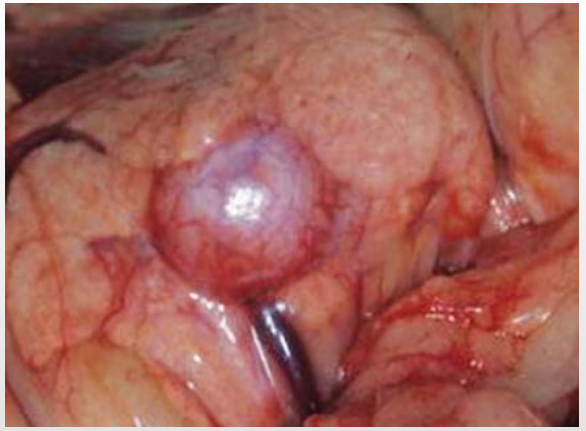
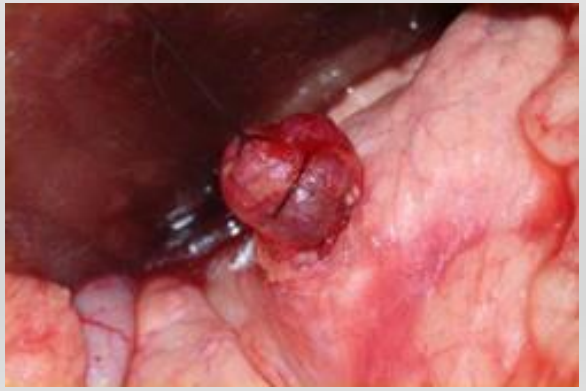
- 60% carcinomas, reminder adenomas
- Produce mainly insulin, but also glucagon, somatostatin, gastrin and pancreatic polypeptides
- 50% metastasized at time of diagnosis (liver, regional lymph nodes)



- Medical management:
  - Frequent small meals high in complex carbohydrates and proteins
  - 5% dextrose iv to control hypoglycemia
  - Careful monitoring of glucose
  - Glucocorticoids

- Indications:
  - Confirmation of diagnosis
  - Staging of disease
  - Resection of tumour
- 80% single nodule, no predilection site in pancreas
- Procedures:
  - Biopsy of regional lymph node and liver
  - Tumour resection
  - Partial pancreatectomy
- Frequent monitoring of glucose imperative intraoperatively

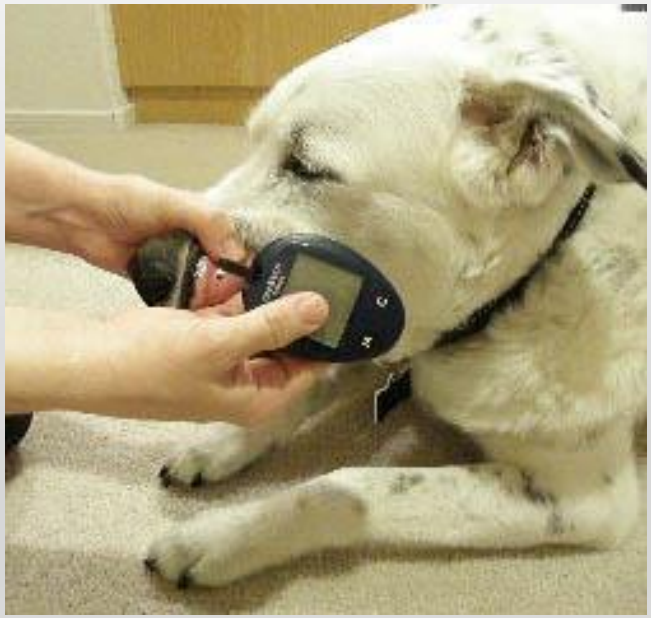




- Monitoring glucose closely postoperative
- Administration of insulin may be necessary
- Treatment of pancreatitis

- Treatment of persistent hypoglycemia
  - Streptozocin
  - Prednisolone
  - Diazoxide
  - Octreotide

- Prognosis variable



GASTRINOMA

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- Gastrin-secreting islet cell tumours, mainly arising in the pancreas
- Zollinger-Ellison syndrome
- 70% metastasized at time of diagnosis (liver, regional lymph nodes)

- Procedures:
  - Biopsy of liver and regional lymph nodes
  - Resection of sites with gastrointestinal ulceration if necessary
  - Partial pancreatectomy

- Postoperative medication to reduce gastric acid secretion
  - Omeprazole, sucralfate, H_2 receptor antagonists

- Overall survival ranging from 1 week to 18 months

QUESTIONS?

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