Cystic Neoplasms of the Pancreas: RESECTION

We are surgeons, are we not?

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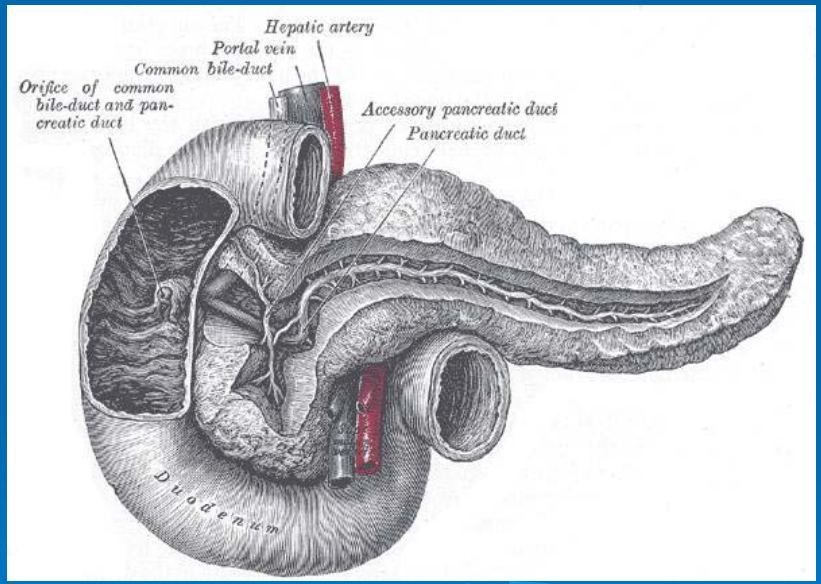
September 19,2011

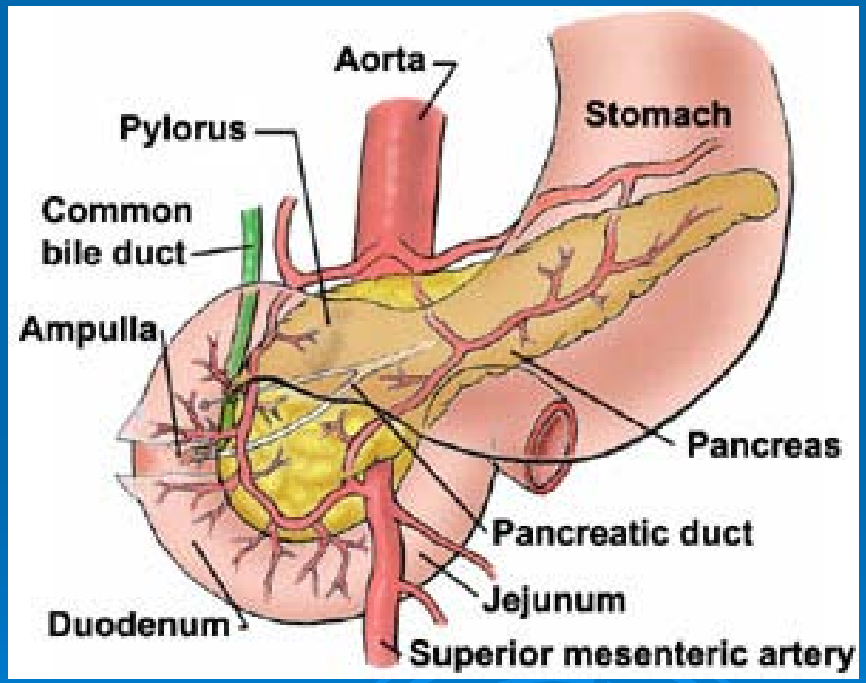
The Pancreas

- The **pancreas**
  - **Endocrine organ** made up of the islets of Langerhans
  - **Exocrine organ** consisting of acinar & ductal cells.
    - Majority of pancreatic cystic neoplasms



Cystic Neoplasms of Pancreas

- **Cystic neoplasms** account for about 10% of pancreatic neoplasms
- Usually benign but can be premalignant and malignant
- Account for up to 30% of pancreatic resections



Cystic Neoplasms of Pancreas

- More cystic lesions of pancreas identified due to better and more frequent use of imaging.
  - >20% people with non pancreatic conditions had imaging with incidental finding
  - Autopsy study 24% pancreatic cysts.
    - 10% cystic neoplasms

Diagnosis

- History
- CT scans
  - Calcifications, nodules, septations
  - Discriminatory in 40%
- MRI/MRCP
  - Better characterization of cysts
  - Connection of duct to cysts
- Cytology/FNA
- EUS

Types of Cystic Neoplasms of Pancreas

Non mucinous

- Serous cystadenomas
- Solid Pseudopapillary

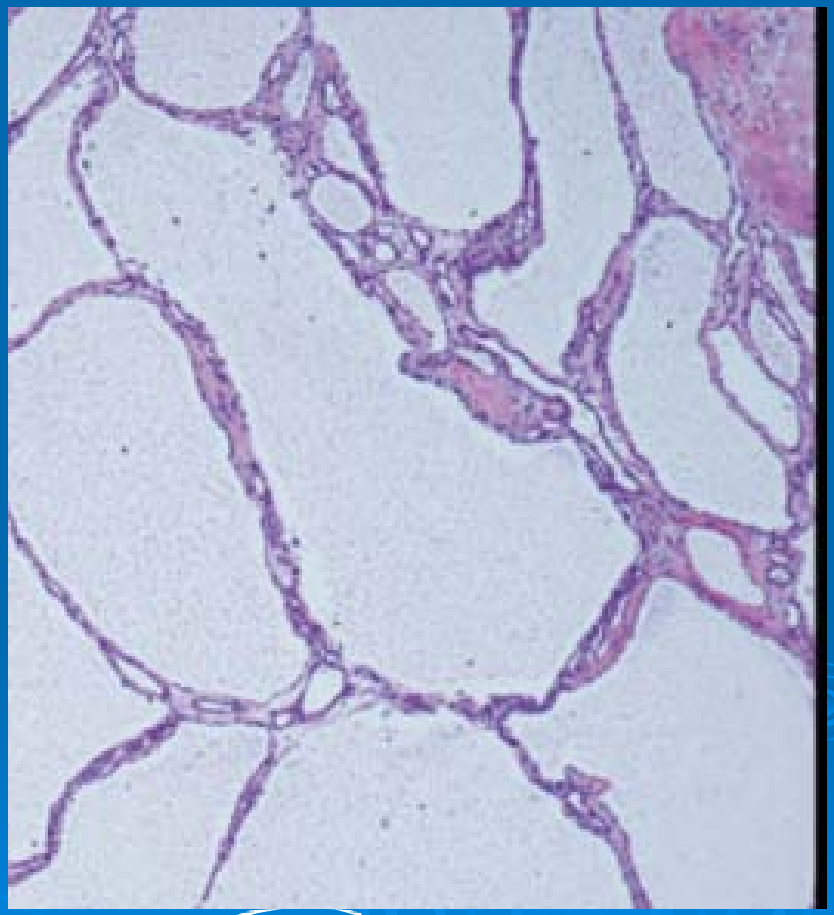
Mucinous

- Mucinous cystic neoplasms
- Intraductal Papillary Mucinous Neoplasms

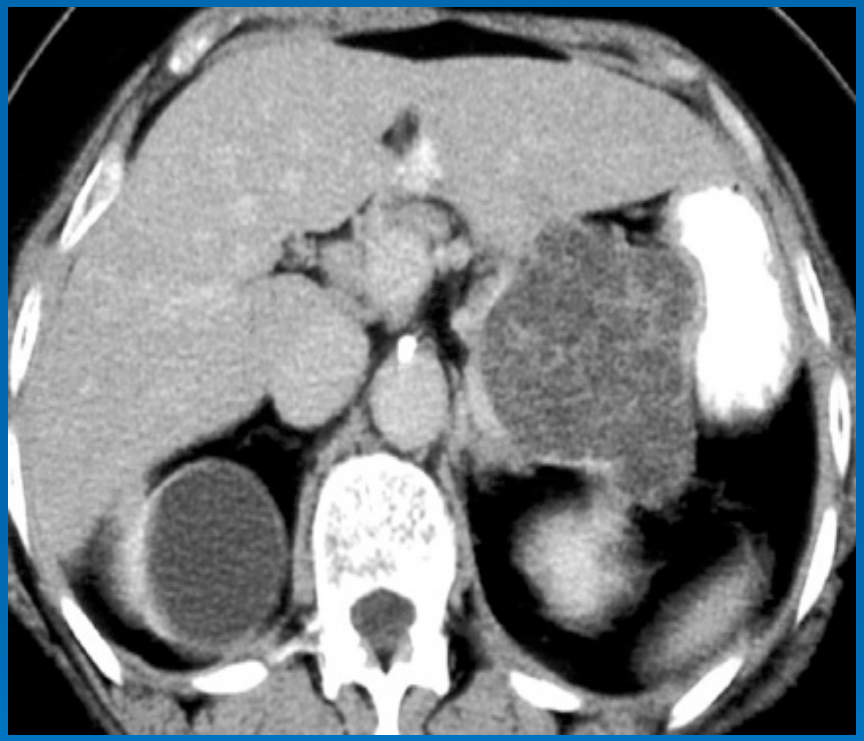
Compagnoa and Oertel

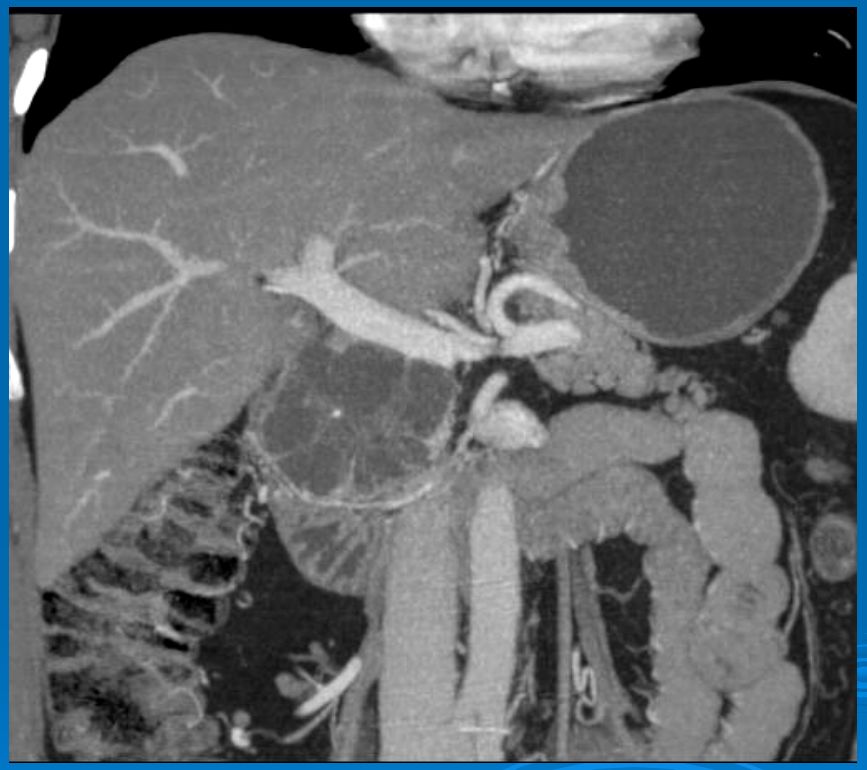
Serous Cystadenoma: Characteristics

- Common cystic lesion
  - 30% of cystic lesions
- Benign lesion
  - Glycogen-rich epithelial lining.
- Women in their 60s
- Average size of 5-8 cm



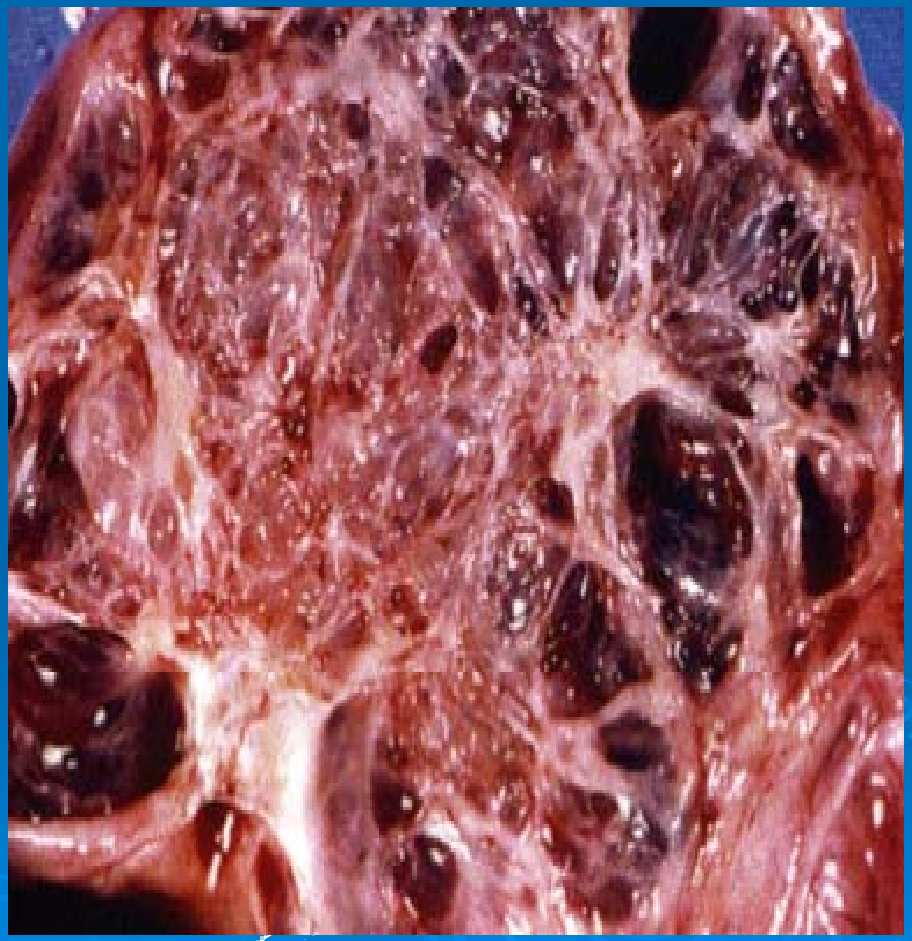
CT scans of Serous Cystadenoma





Serous Cystadenoma: Diagnosis

- **Rarely** malignant
- FNA challenging
  - Low CEA
  - Low CA19-9
  - Low amylase
- Oliogocystic variant can be hard to distinguish from **MCN or IPMN**

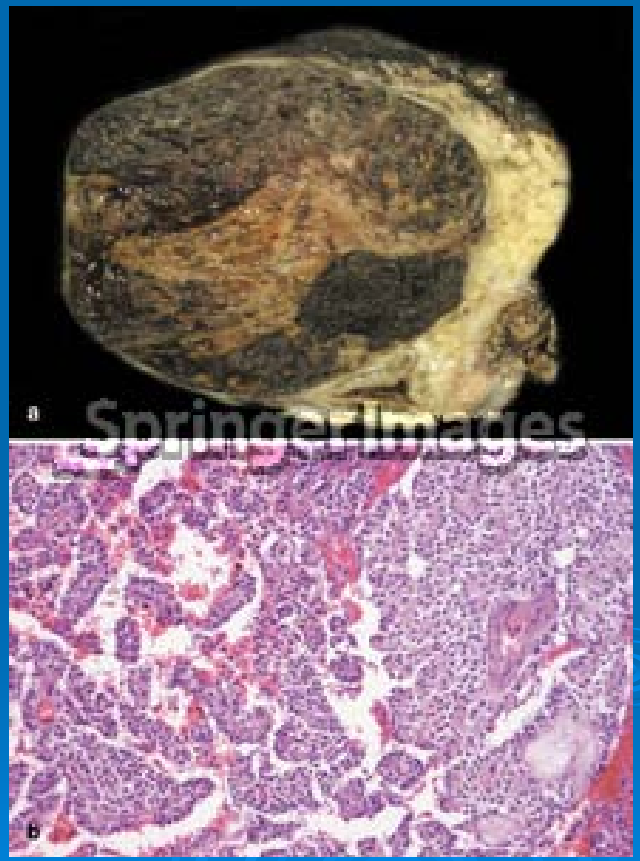


Serous Cystadenoma: Treatment

- **SURGICAL RESECTION** for
  - Symptomatic lesions.
    - Tumors over 4 cm can grow >1.98 cm per year
  - Unclear diagnosis of lesion
- Some data that cysts <4cm could be watched.
- Some reports of malignant transformation to Serous Cystadenocarcinoma

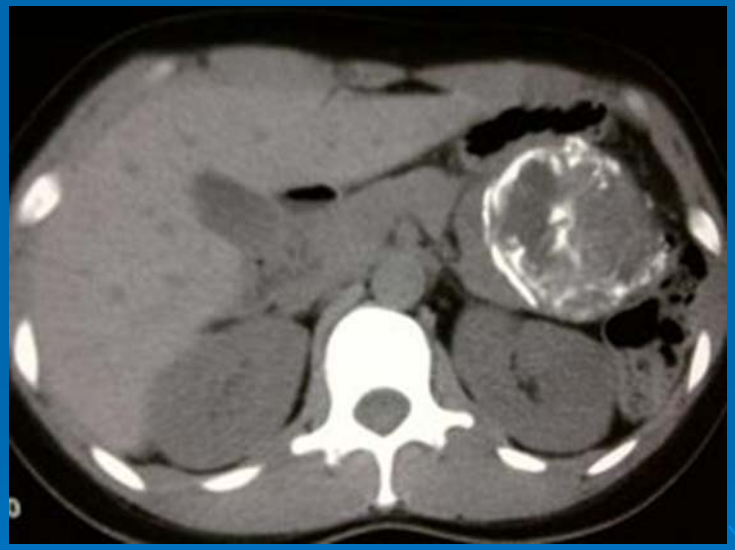
Solid Pseudopapillary Tumor: Characteristics

- Aka Franz tumor or Hamoudi tumor
- Solid & cystic components
- Rare
- In young women
- In body/tail
- Locally invasive large tumors
  - 10% develop metastases



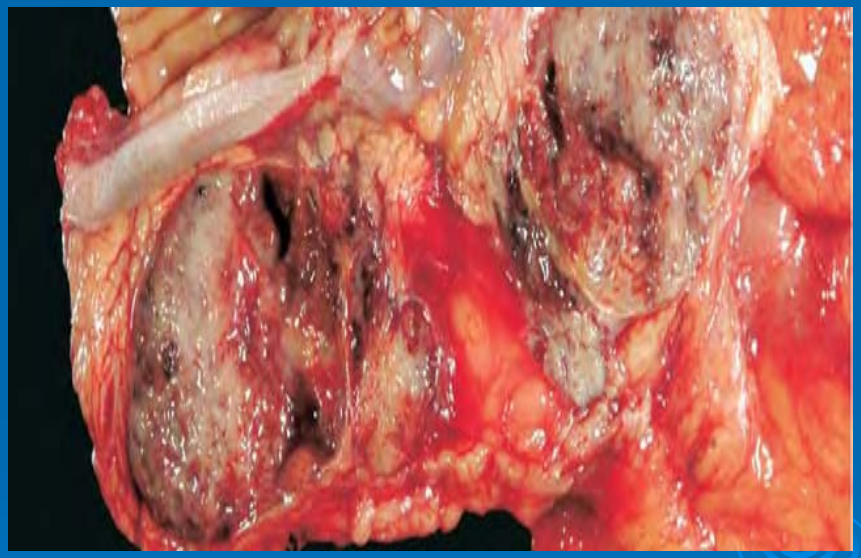
Solid Pseudopapillary Tumor: CT scan

Well encapsulated, solid masses with thickened capsules and variable amount of internal hemorrhage, cystic degeneration and calcification



Solid Pseudopapillary Tumor: Treatment

- Surgical resection is highly curative
- Butte study at MSK
  - 45 patients
  - Good long-term survival following resection
    - 75% disease free
  - 9 with malignant disease
    - 3 died from disease

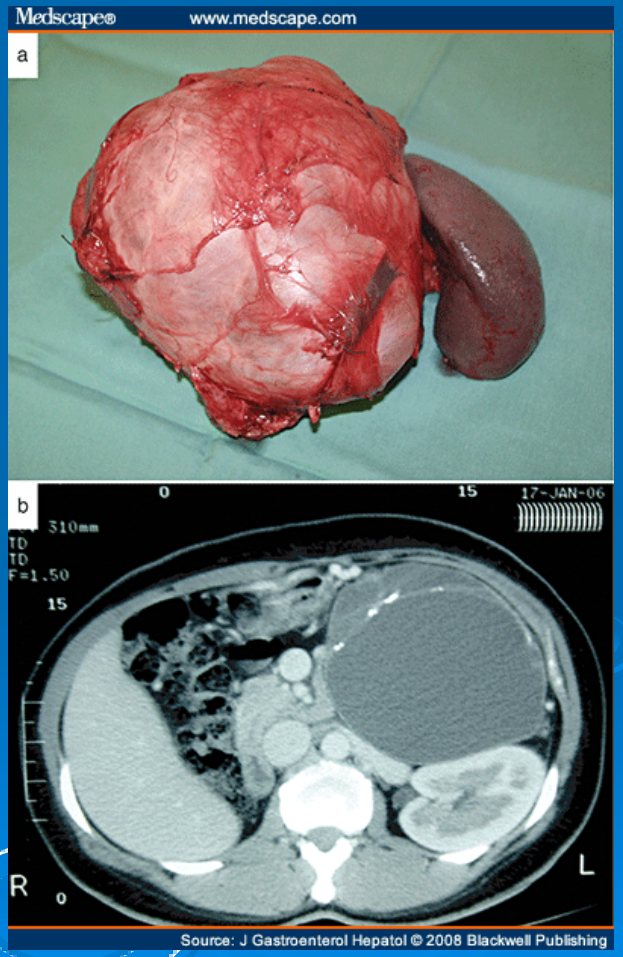


Mucinous cystic lesions

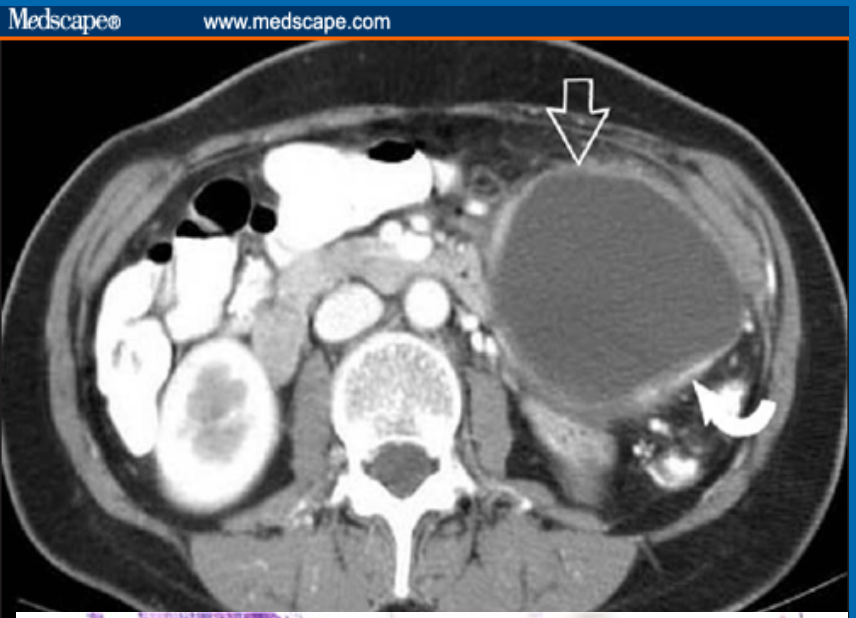
- 2 types of mucinous cystic lesions:
  - **Mucinous Cystic Neoplasms (MCN)**
    - Mucinous cystadenoma
    - Mucinous cystadenocarcinoma
  - **Intraductal Papillary Mucinous Neoplasms**
    - Main branch
    - Side branch
- Considered Pre Malignant lesions
  - Adenoma to carcinoma sequence

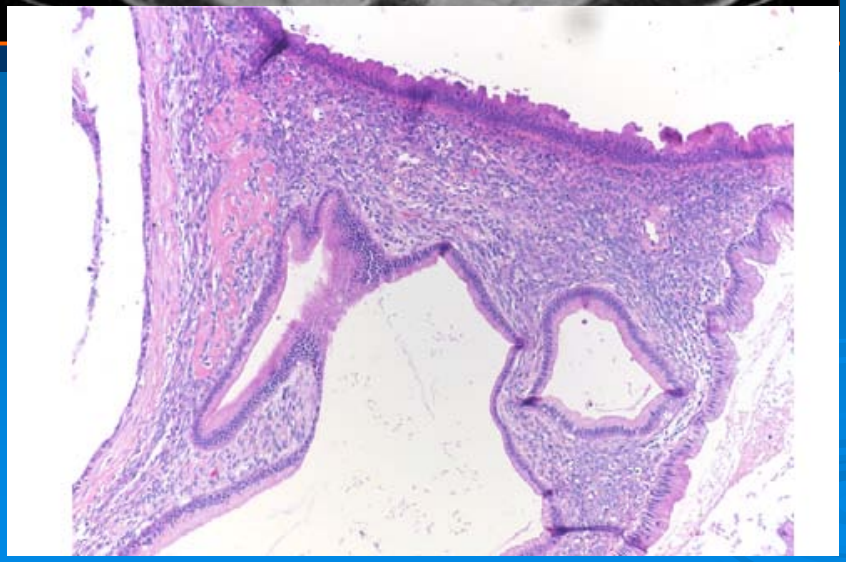
Mucinous Cystic Neoplasm (MCN): Characteristics

- In middle age women
- No communication with the pancreatic duct
- Body or tail of pancreas.
- Average size 10 cm
- Dense ovarian like stroma
- Mucinous secretion from stromal epithelial lining



MCN Diagnosis





- CT-
  - Thick cyst wall,
  - Single or multiple septated macrocystic spaces
  - Peripheral eggshell calcification
- EUS
- Cytology/FNA
  - CEA >800 ng/ml specific but only 48% sensitive
- Need the MCN surgically resected

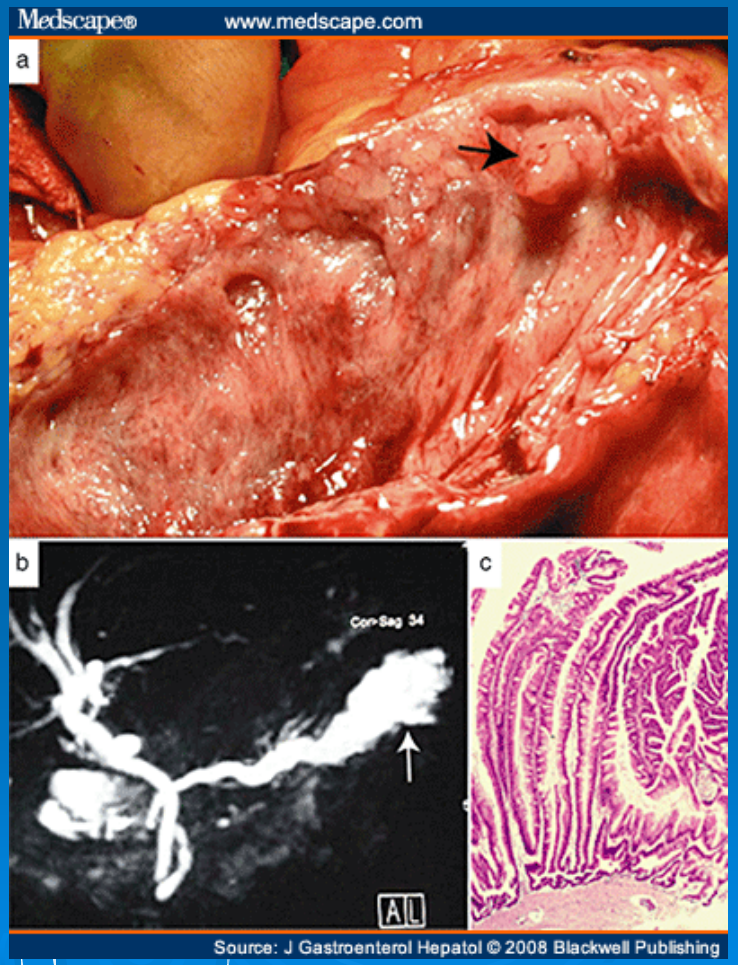
MCN treatment

Surgical resection recommended for all MCN.

- All MCN may progress to cancer
  - MGH study found 64% of MCN had malignancy
- Most MCN patients are young with high life expectancy
  - Ongoing risk for progression to malignancy
  - Life time follow up and anxiety
- Since most MCN are in body/tail:
  - Surgery is distal pancreatectomy
  - Laparoscopic approach being considered

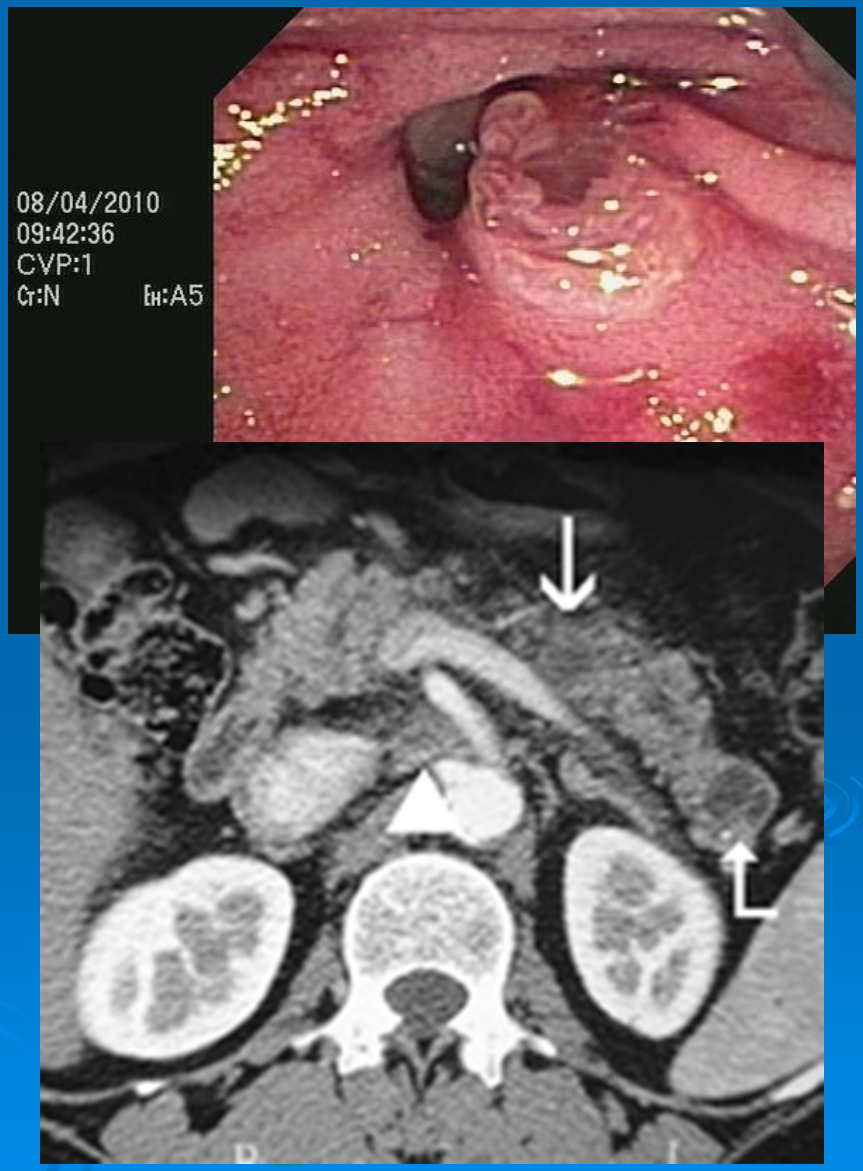
Intraductal Papillary Mucinous Neoplasm (IPMN):Characteristics

- Neoplastic process of pancreatic duct epithelium
- In elderly
- Male = female
- Head of pancreas in >50%
  - But can be anywhere along pancreas
- Progress to invasive cancer
- Connected to
  - Main pancreatic duct or
  - Branch duct



IPMN Characteristics

- Mucin-producing papillary epithelial neoplasms
- Tumors are Main duct branch duct, or mixed
  - MD IPMN and BD IPMN act differently



Main Duct IPMN

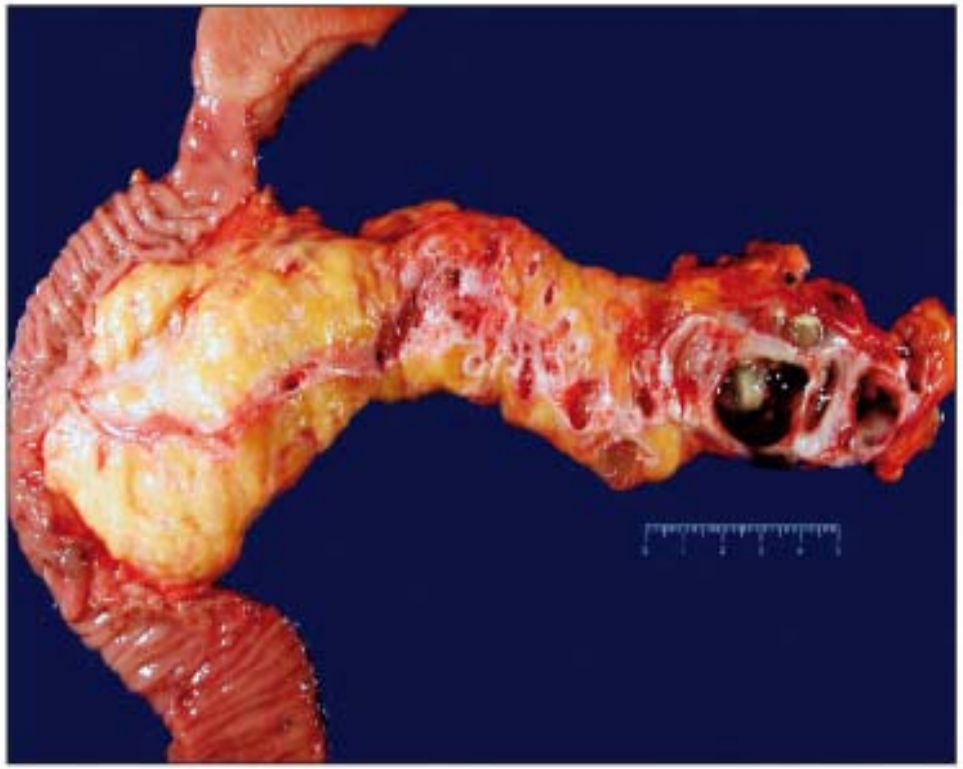
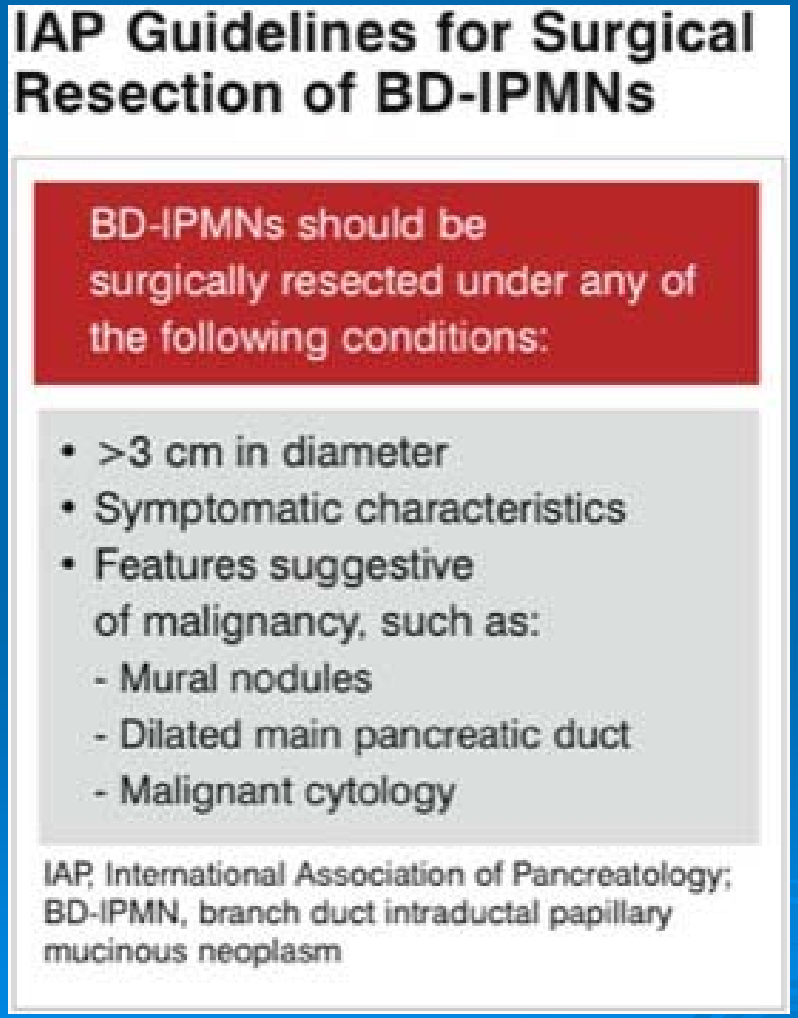


Fig. 1. IPMN specimen of total pancreatectomy showing the main pancreatic duct. A significant dilation from de joint of head and body with cystic dilations containing mucinous in the tail.

- Malignancy reported in 58-92% of main duct IPMN
- Malignancy more common in older patient
  - Malignancies were found to be 6.4 years older than those with adenomas or borderline neoplasms
- "Clonal progression" indicate that benign MD-IPMN may progress to invasive disease

Salvia, Thompson

Branch Duct IPMN



- Malignancy less common
  - Reported 6-46%
- 2008 Mayo
  - **Cysts size** was not significant in predicting malignancy
- 5 year survival of resected BD IPMN
  - 100% non invasive versus 63% invasive

Rodriquez

IPMN: Treatment

2006 International Association of Pancreatology recommendations for surgery

- ALL Main Duct IPMN
- Branch Duct over 3 cm cyst
- Branch duct with cyst over 1 cm with mural nodule
- IPMN with dilated main duct
- IPMN on cytology
- Any solid component

Tanaka

IPMN Treatment

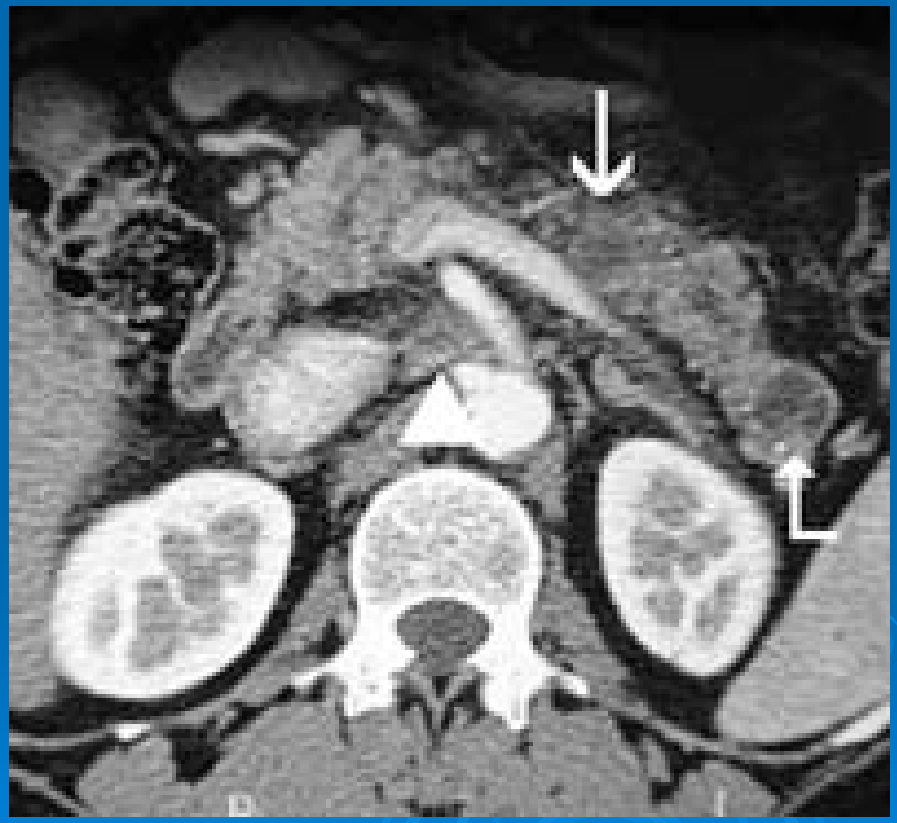
Surgical resection

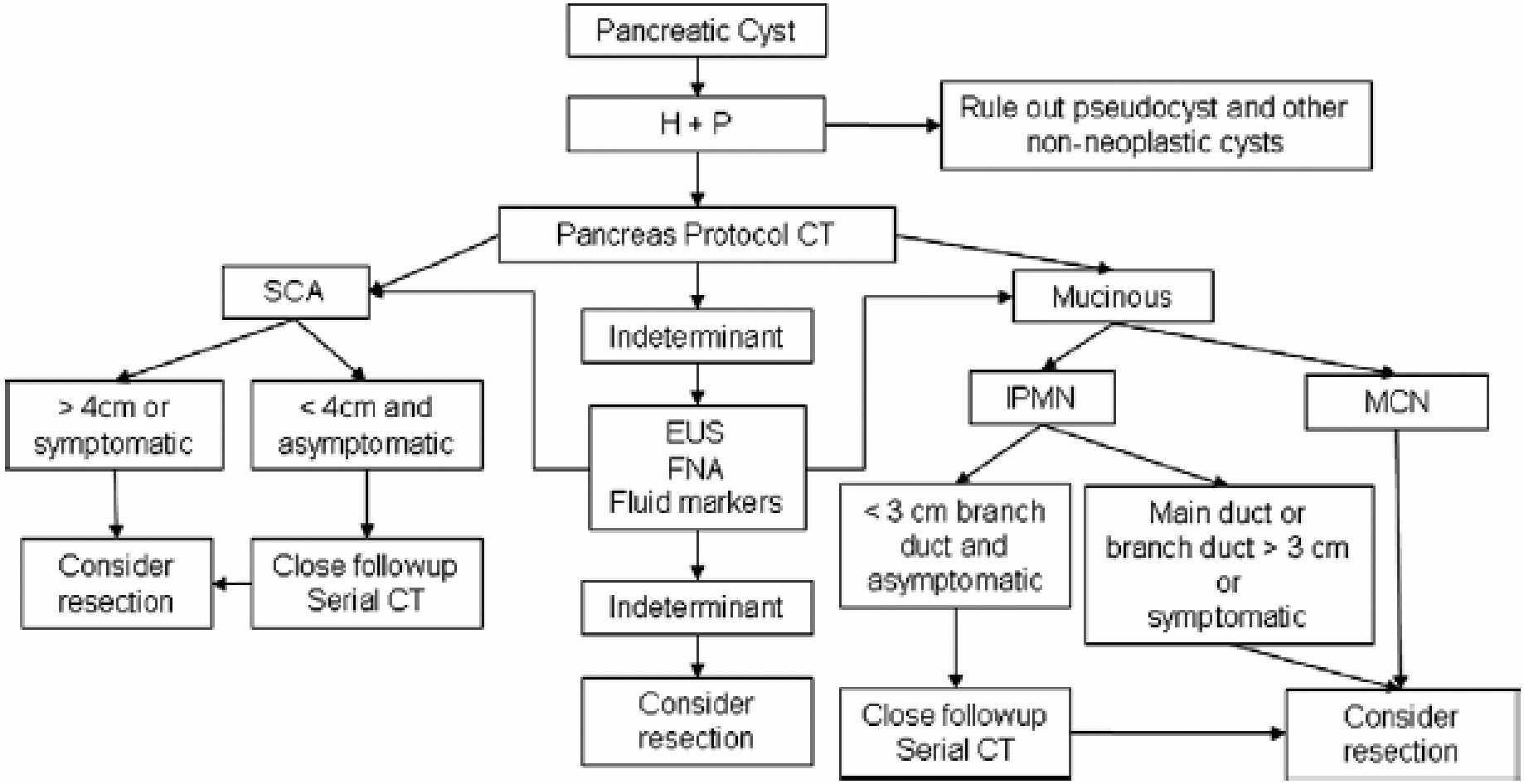
All MD-IPMN

- Intraoperative frozen sections

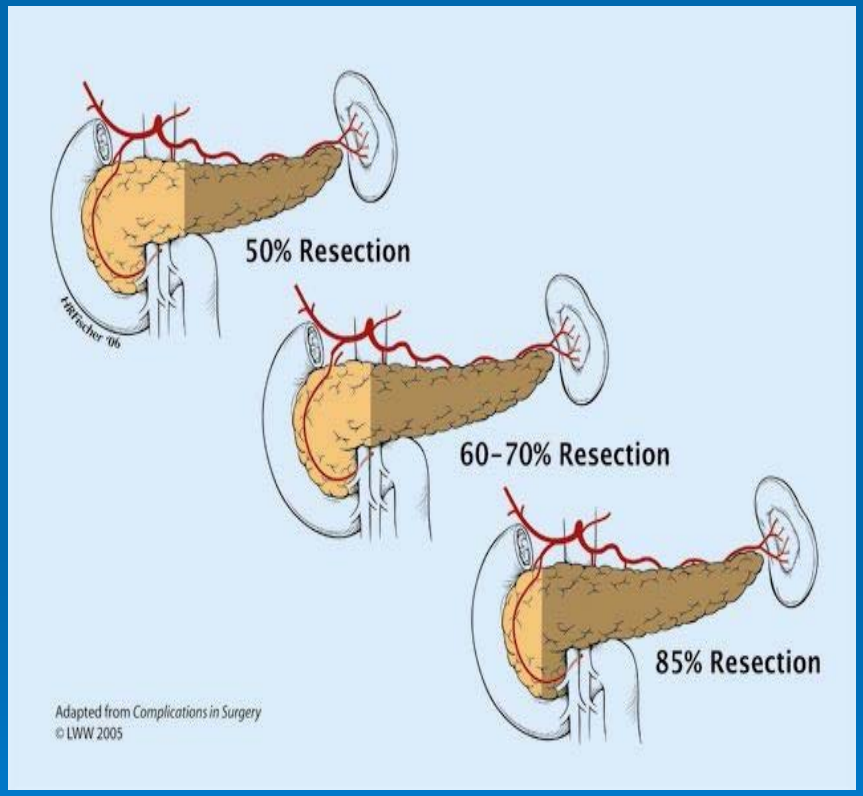
Few side branch IPMNs can be observed

- Side-branch < 2-3 cm
- Weinberg study
  - Overall survival vs quality adjusted survival
  - OS resect >2 cm




Pancreatic Cyst
H + P
Rule out pseudocyst and other non-neoplastic cysts
Pancreas Protocol CT
SCA
Indeterminant
Mucinous
> 4cm or symptomatic
< 4cm and asymptomatic
EUS
FNA
Fluid markers
IPMN
MCN
Consider resection
Close followup Serial CT
Indeterminant
< 3 cm branch duct and asymptomatic
Main duct or branch duct > 3 cm or symptomatic
Consider resection
Close followup Serial CT
Consider resection

Surgeries



Distal pancreatectomy

For lesions at tail of the pancreas

Some are attempting laparoscopic approach

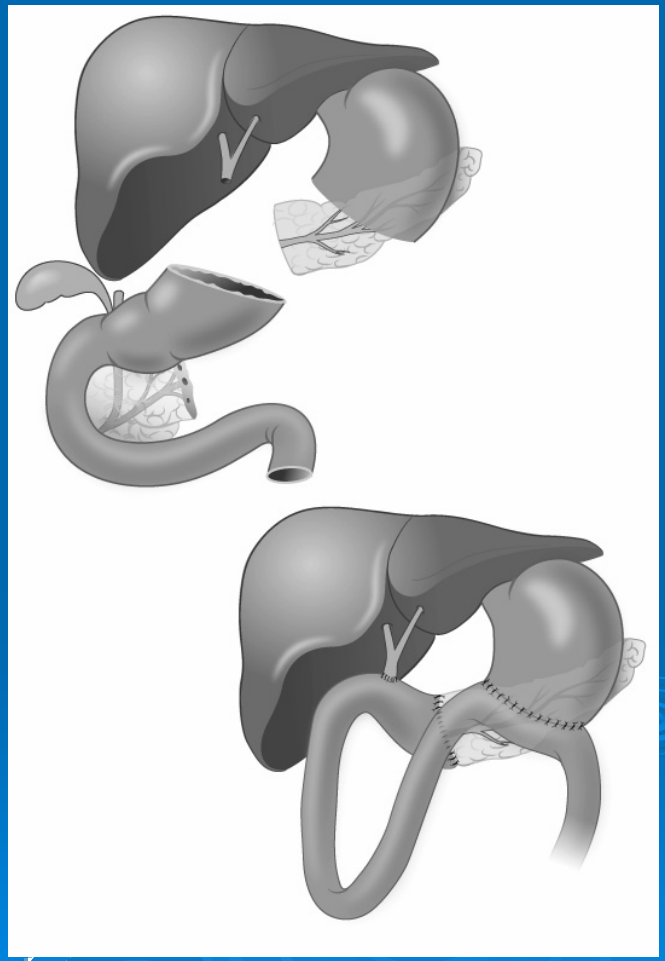
- can remove up to 70% without risk diabetes

Surgeries

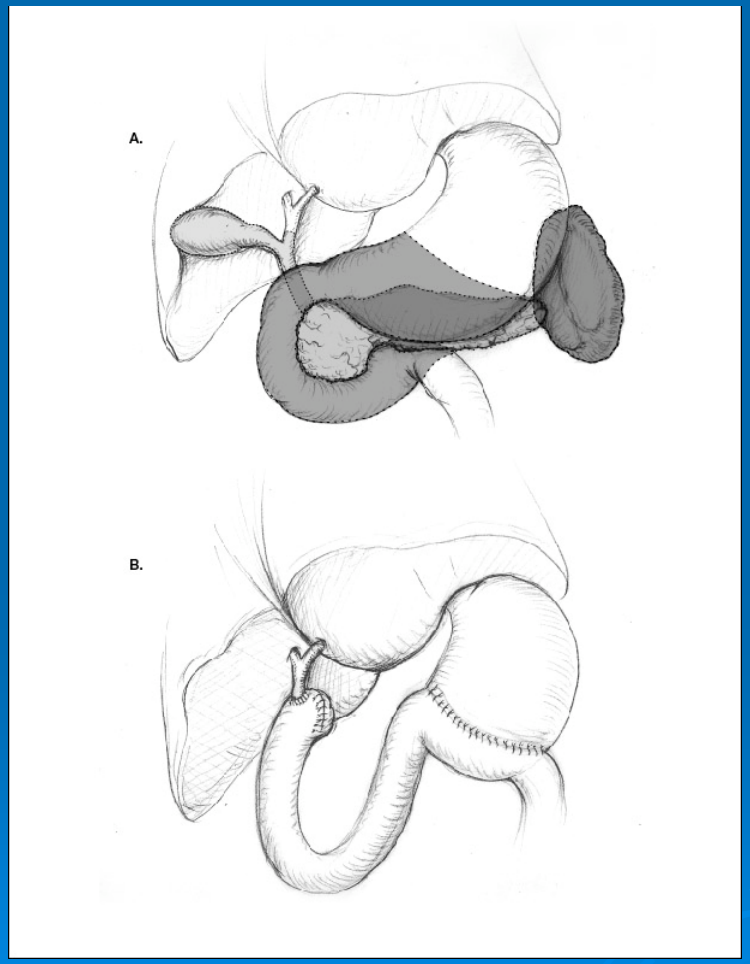
Whipple procedure

(pancreaticoduodenectomy)

For lesions in the head or uncinate process of the pancreas



Surgeries



Total pancreatectomy

In rare instances in which neoplasm involves the entire length of the pancreas

Surgical complications

- Pancreatic Fistula 10%
  - More likely to form fistula in benign disease
  - Spontaneous closure
- Intra-abdominal abscess
- Wound infections
- Hemorrhage
- Mortality
  - 1-4% in high volume centers

Sheehan, Goh

Pancreatic Cystic Neoplasms

Type	Demographic	Prevalence	Treatment
Serous Cystadenoma	60's Females	30%	• RESECT if symptomatic or over 4 cm • Resection is curative
MCN	40's Females	10-45%	• RESECT all • Resection curative if non-invasive
IPMN	60-70's Male = Female	20-30%	• RESECT all main branch • RESECT branch duct if meets criteria
Solid Pseudopapillary Neoplasm	30s Female	<10%	• RESECT • Resection curative if non-invasive

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