Cystic Neoplasms of the Pancreas: RESECTION

We are surgeons, are we not?

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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
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
- Oligocystic 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**
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

- 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
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
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
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
# Pancreatic Cystic Neoplasms

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<tr>
<th>Type</th>
<th>Demographic</th>
<th>Prevalence</th>
<th>Treatment</th>
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| 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                                     |
References