

A decorative graphic on the left side of the slide consisting of white and light blue lines that resemble a circuit board or a stylized tree. The lines are vertical and horizontal, with small circles at the ends, creating a complex, branching pattern.

PANCREATIC CYSTS

EVERYTHING YOU WISH YOU DIDN'T KNOW

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DISCLOSURE

- I have no conflicts
- 
- 
- 

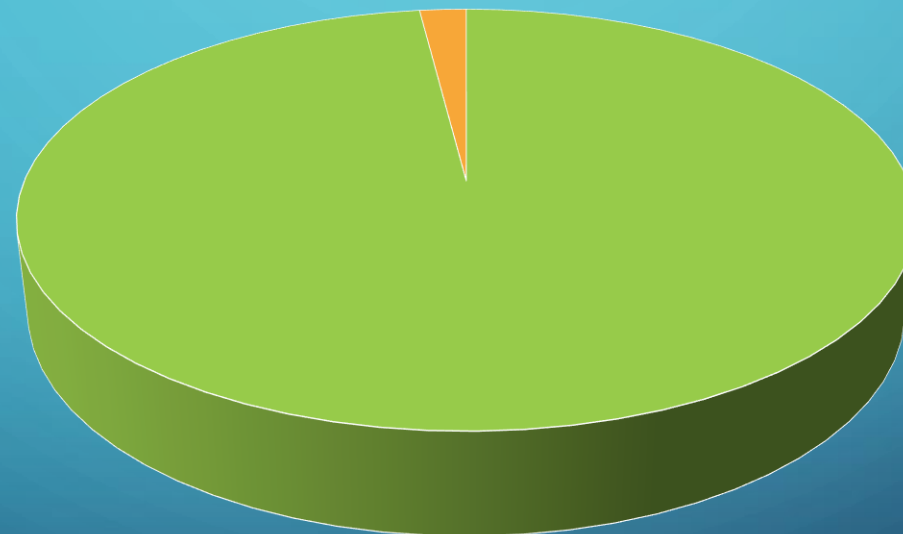
CLINICAL CORRELATION REQUIRED...

- “Cystic lesion of the pancreas measuring 9mm. Diagnostic considerations include intraductal papillary neoplasm or pseudocyst. Consider surgical referral. Clinical correlation required. Follow up in 6 months to ensure stability...”



**FIGHT
CANCER**

Risk of pancreatic cysts



■ benign ■ malignant ■ ■

FOES AND FRIENDS

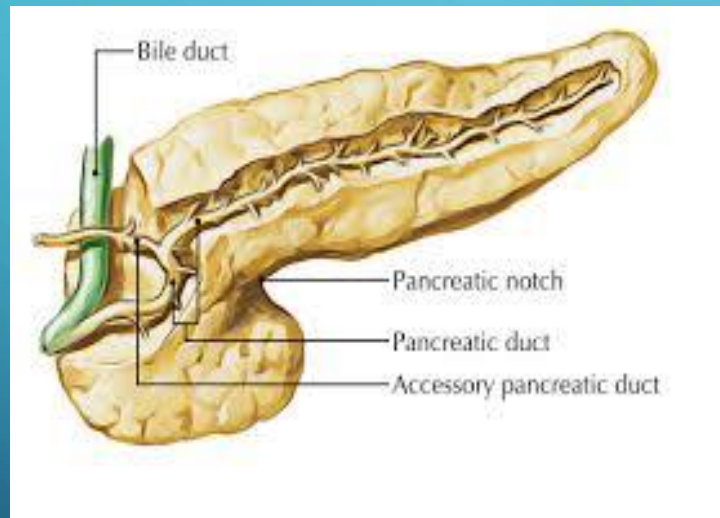


RULES OF SURGERY

- Eat when you can
- Sleep when you can
- Don't #@%& with the pancreas

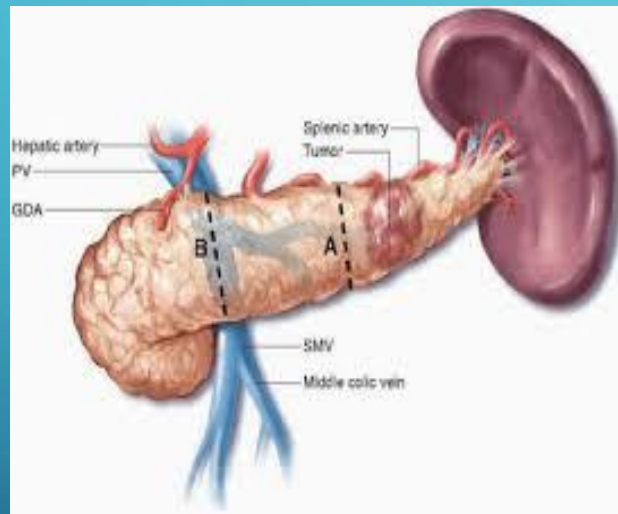
THE PANCREAS

An organ so obnoxious distal is proximal and proximal distal

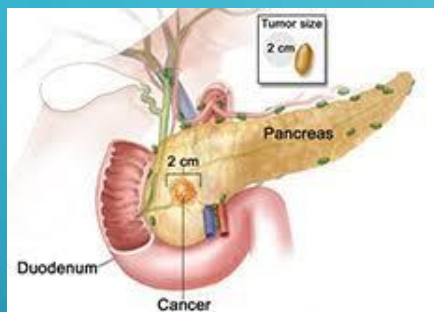


PANCREATIC RESECTIONS

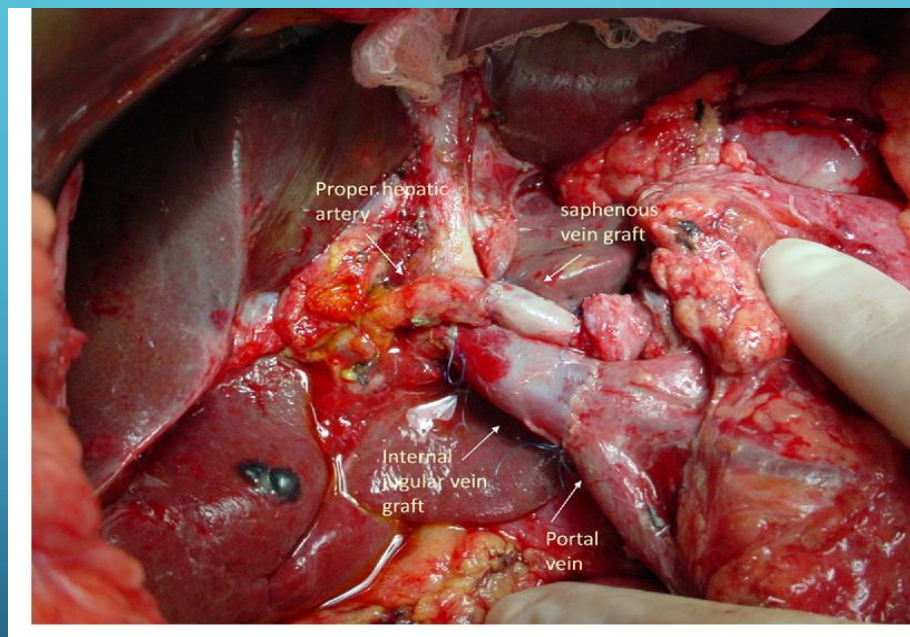
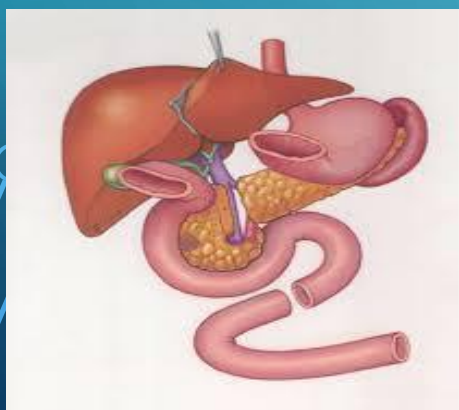
- The moderately difficult one



PANCREATIC RESECTIONS



difficult one



THE FIRST RULE OF PANCREATIC CYSTS

- Forget about the cyst — talk to the patient



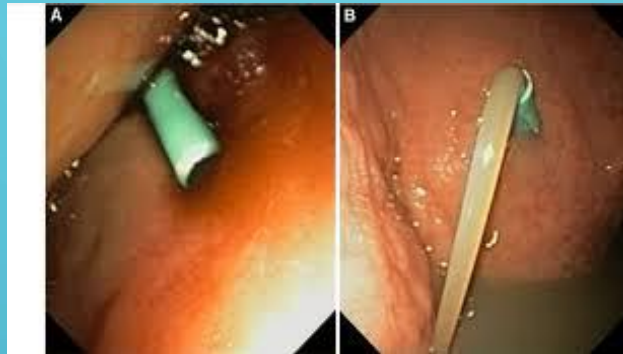
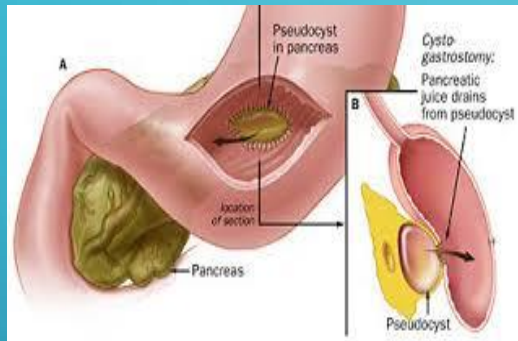
WHAT IS A CYST?

- Pseudocyst
- Neoplastic –Benign vs malignant
- Nonneoplastic

PANCREATIC PSEUDOCYSTS

- Sequelae of pancreatitis/trauma
- Treatment is observation/drainage
- Be vigilant that tumours can be a cause of pancreatitis

PSEUDOCYSTS



NEOPLASTIC CYSTS

- In asymptomatic population 2.4-13.5%
- Increasing prevalence with age
- 40% plus in patients over 70 years old
- Increased “prevalence” actually due to more imaging/better quality images

INCIDENTAL FINDING

- Be cautious attributing symptoms to a cyst
- VAST majority asymptomatic and not related to indication for initial imaging
- Even in pancreatitis patients – PCN's represent 50% of cysts
- In surgical series 50-84% have cysts attributable to the cyst
- Symptoms weakly associated with cancer risk
- Abdominal pain, jaundice, palpable mass, weight loss
- Neoplastic cysts as cause of pancreatitis, and misinterpreted as the result of pancreatitis.

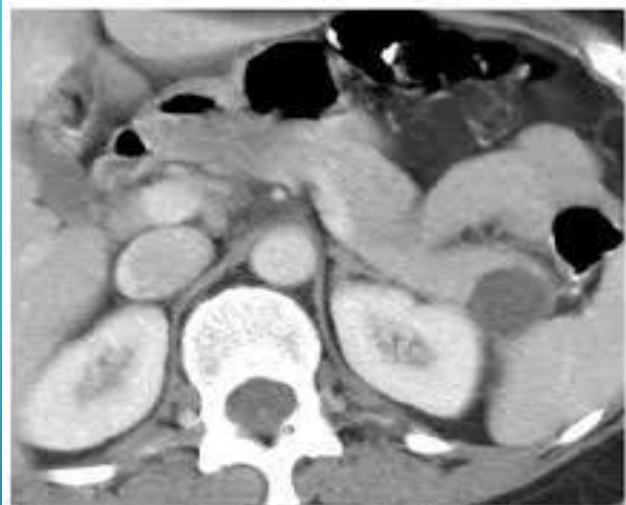


Figure 1. CT scan of unilocular cyst within the tail of the pancreas. (Patient #1)

CANCER RISKS

- Overall the risks is exceedingly low
- SEER database 0.25% harbour malignancy
- Conversion rate 0.24% per year.

OPTIONS

- Leave in and ignore
- Leave in and follow
- Take out

TABLE 3 – Distribution of postoperative complications

COMPLICATIONS	INCIDENCE (%)
Pancreatic fistula	27 (50,00)
Delayed gastric emptying	7 (12,96)
Hemorrhage	5 (9,26%)
Acute renal failure	3 (5,55%)
Biliary fistula	2 (3,70%)
Intra-peritoneal collection	2 (3,70%)
Peritonitis	2 (3,70%)
Plural effusion	2 (3,70%)
Septic shock	1 (1,85%)
Coagulopathy	1 (1,85%)

Table 6: Distribution of cause of mortality

Cause of mortality	No. of patients	Percentage
Septicemic shock due to pancreatic leak, biliary leak	7	53.86%
Hemorrhage	3	23.07%
Respiratory complications	3	23.07%
Total	13	100%

SURVEILLANCE

- \$\$\$\$\$\$
- ++++++ worry
- Cancer prevention unproven
- What is the end game?
- Bigger, more worrisome cysts found more in elderly patients who may not do well with surgery

HOW TO DECIDE?



HOW TO DECIDE?

- Patient factors
- Cyst factors
 - Cyst type
 - Size
 - Solid component

AND IF WE DO DECIDE TO FOLLOW, THEN WHAT?

- What interval
- What modality
 - Ultrasound
 - CT
 - MRI/MRCP
 - EUS
 - (anybody note what is missing)

CT VS MRI

- Both 40-60% accurate for predicting correct histologic diagnosis
- MRI preferred
 - Connection with Pancreatic duct
 - No ionizing radiation

CYST FACTORS

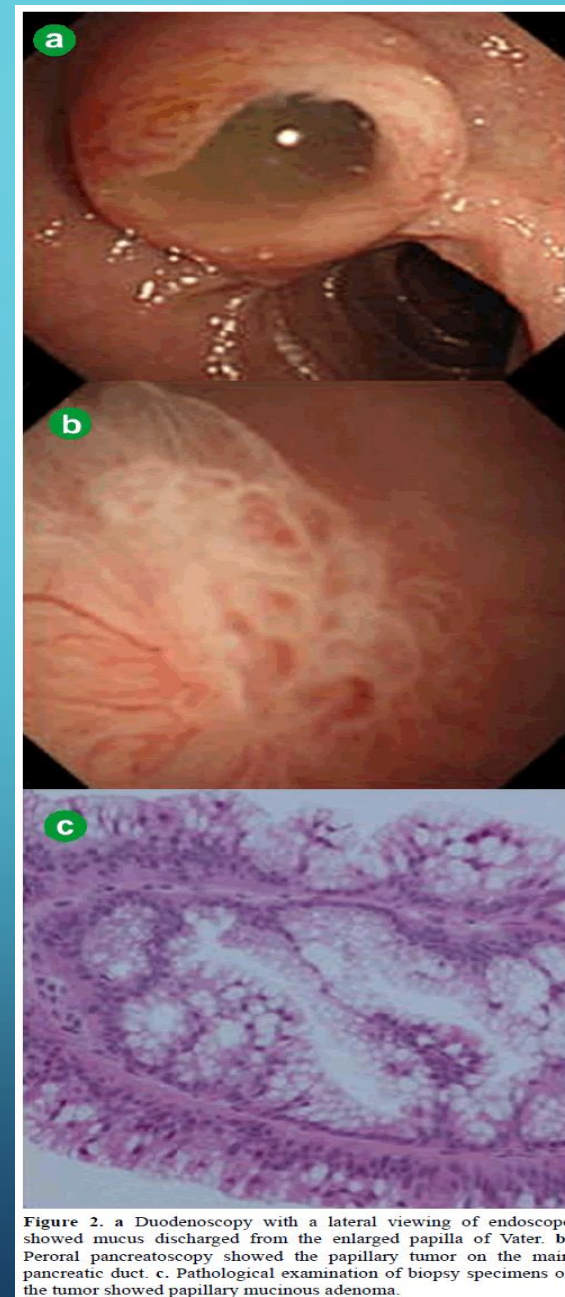
- Cyst type
 - Side Branch IPMN
 - Main duct IPMN
 - Mucinous
 - Serous
 - Solid pseudopapillary neoplasm
 - Neuroendocrine
 - Cancer

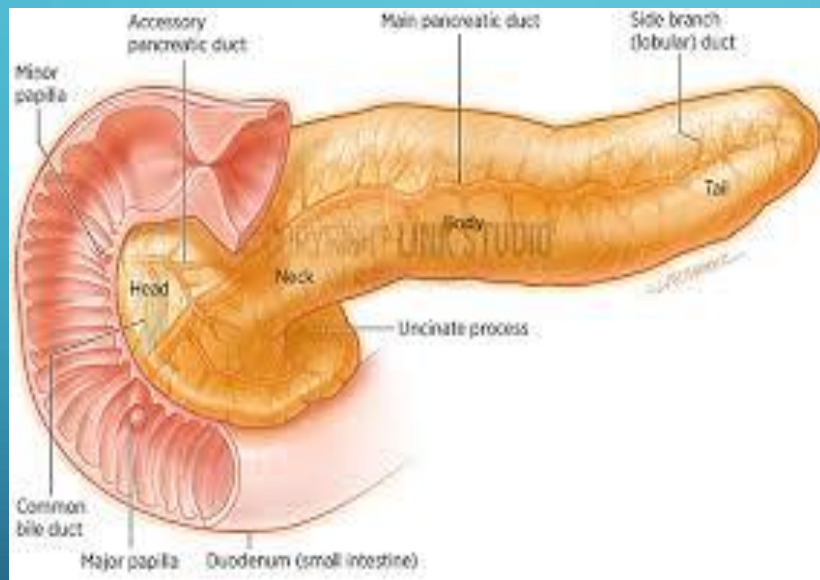
CYST FACTORS

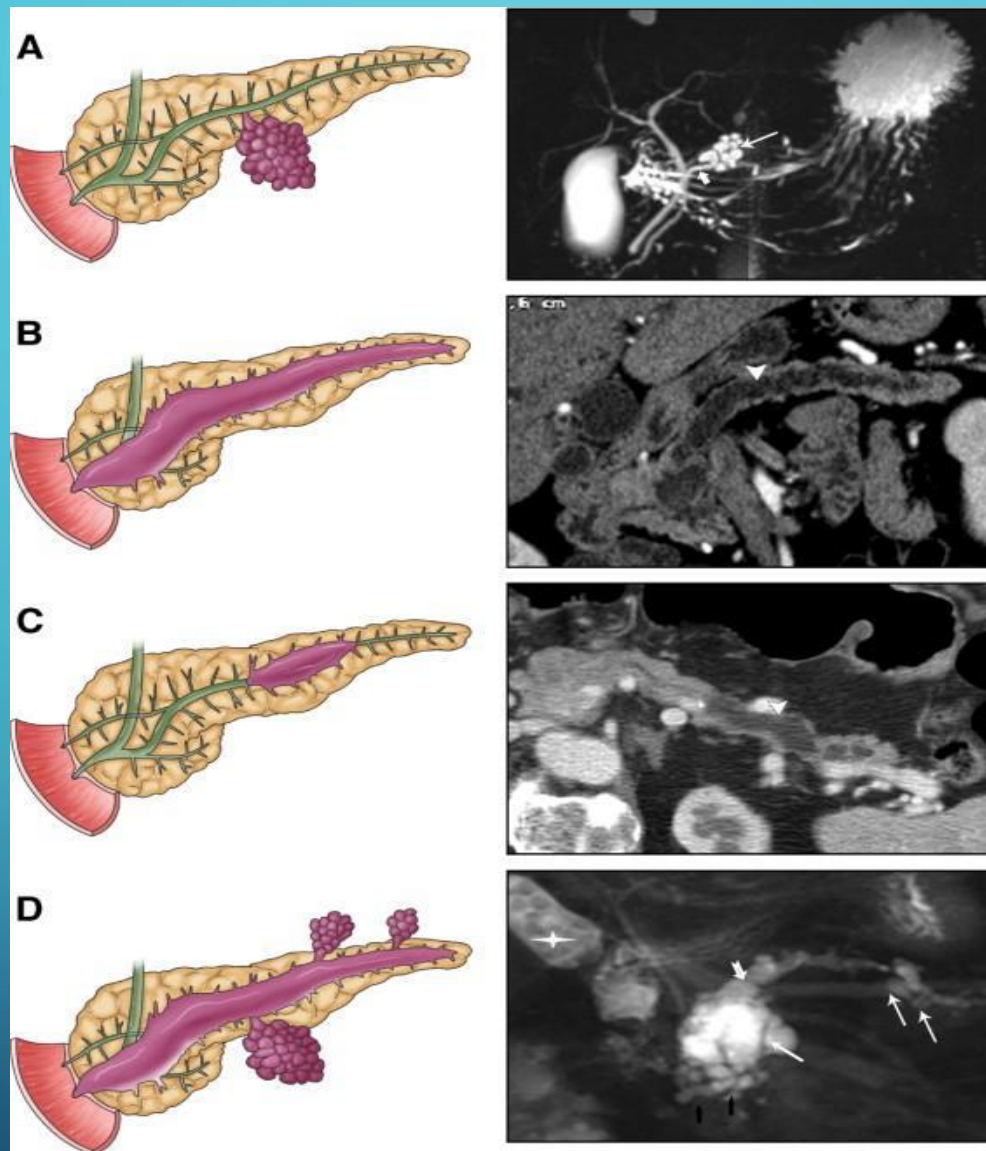
- Size
 - $<5\text{mm}$
 - $>5\text{mm}$
 - $>3\text{cm}$
 - Change in size $>5\text{mm}/2\text{years}$

INTRADUCTAL PAPILLARY MUCINOUS NEOPLASM (IPMN)

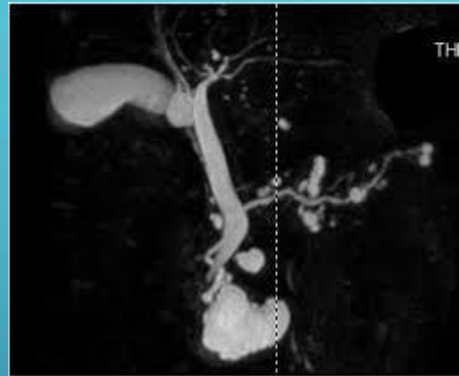
- Equal distribution between males/females
- Mucin producing cystic neoplasm
- Variable cellular atypia
- Build up of mucus causes dilatation of the ducts
- Analogy to colon polyps
- Critical distinction between Main Duct and Side Branch







SIDE BRANCH IPMN



MAIN DUCT IPMN



The background is a blue gradient with decorative white circuit-like lines in the corners. These lines consist of straight segments and small circles, resembling a stylized electronic circuit board.

MIXED TYPE IPMN

MAIN DUCT IPMN

- 70% have high grade dysplasia or malignancy
- Surgical resection strongly considered for MPD > 10mm, jaundice or mural nodules
- MPD 5-9mm a "worrisome feature"
- Can be symptomatic due to mucus obstruction of duct (pancreatitis/steatorrhea/jaundice)

SIDE BRANCH IPMN

- Most present minimal risk to patient
- Small proportion will progress, and increased risk of cancer elsewhere in gland
- Significant paradigm shift from resection to surveillance.
- Consider resection if
 - >3cm
 - Causes symptoms
 - Mural mass
 - Associated main duct dilatation

SIDE BRANCH IPMN

- Multifocal cysts not necessarily higher risk

FOLLOWING SIDE BRANCH IPMN

- Guidelines vary and based on low quality evidence
- MRCP
- Imaging interval variable
- If high risk features – consider surgery
- If worrisome features – consider EUS

EUS AND WORRISOME FEATURES

- Cyst >3cm
- Nodularity
- Dilated PD
- Suspicious mass lesion
- Lymphadenopathy
- Pancreatic atrophy
- Abrupt change in PD size

EUS

- Diagnostic imaging (maybe not advantage over CT/MRI)
- Biopsy
- Fluid aspiration
 - Cytology (useful less than 50%)
 - CEA
 - Amylase
 - Molecular markers

The background is a blue gradient with abstract white lines resembling circuit traces or data paths in the corners. These lines connect small circles, some of which are larger than others. The lines are more prominent in the top-left and bottom-left corners, and less so in the top-right and bottom-right corners.

ERCP

MUCINOUS CYSTIC

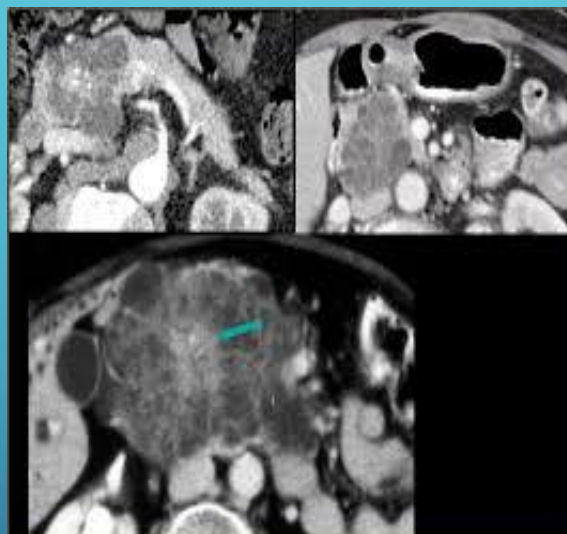
- Women 5th-7th decades
- Ovarian type stroma
- 10% contain HGD or malignancy
- Usually resected
- Body or tail of pancreas.
- Unilocular with no PD communication
- Due to risk of malignancy, resection usually advised in appropriate candidates

FOLLOWING SIDE BRANCH IPMN

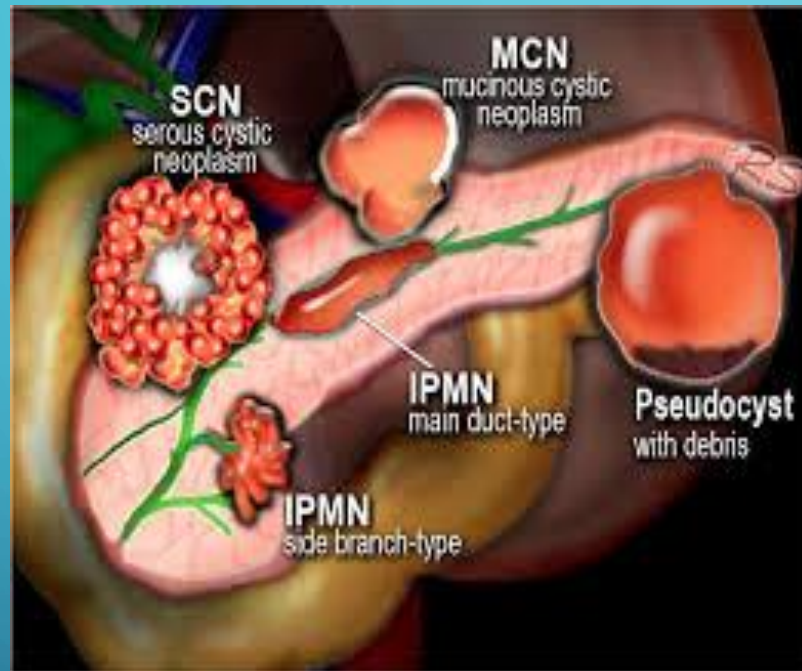
- <1cm imaged annually
- MRI/MRCP test of choice due to lack of radiation/accuracy

SEROUS CYSTADENOMA

- 75% women in 6th decade
- Cancer risk 0.1%
- Benign neoplasms lined by glycogen rich cells
- Can arise anywhere in the pancreas
- Typical radiographic appearance
- Can cause symptoms due to size



TAKE AWAY MESSAGE



THE BOTTOM LINE

- ONLY mucin producing lesions have malignant potential (ie mucinous cystadenoma and IPMN)
- Serous lesions rarely require surgery
- Main duct IPMN may require surgery
- Mucinous cystic neoplasm should be resected
- Side branch IPMN rarely require surgery, but will need surveillance

GUIDELINES

- Numerous guidelines in rapid evolution (Sendai, AGA, ASGE, Fukuoka)
- Often contradictory
- Trend towards less aggressive surveillance/less surgery (?75% of resections in the past unnecessary??)

TABLE 2. Surgical resection recommendations for pancreatic cysts according to current guidelines

Diagnosis	Fukuoka 2012	European 2013	AGA 2015
MCN	Resection	Resection	Resection
SPN	Not mentioned	Resection	Resection
MD-IPMN	Resection	Resection	Yes, however*
Mixed-IPMN	Resection	Resection	Yes, however*
BD-IPMN	<ul style="list-style-type: none"> • Pancreatitis (for relief of symptoms) • Obstructive jaundice • Solid component • MPD ≥ 1 cm • +Cytologic features suggestive of adenocarcinoma • Definite mural nodule on EUS • MPD features suspicious for involvement§ • >3 cm cyst in young surgically fit patient 	<ul style="list-style-type: none"> • Acute pancreatitis jaundice, diabetes • Mural nodule • MPD >6 mm • Size ≥ 4 cm • Rapidly increasing size‡ • Elevated serum CA19-9 level‡ 	<ul style="list-style-type: none"> • Solid component <i>and</i> MPD ≥ 5 mm (both on EUS <i>and</i> MRI) • <i>and/or</i> concerning features on EUS†

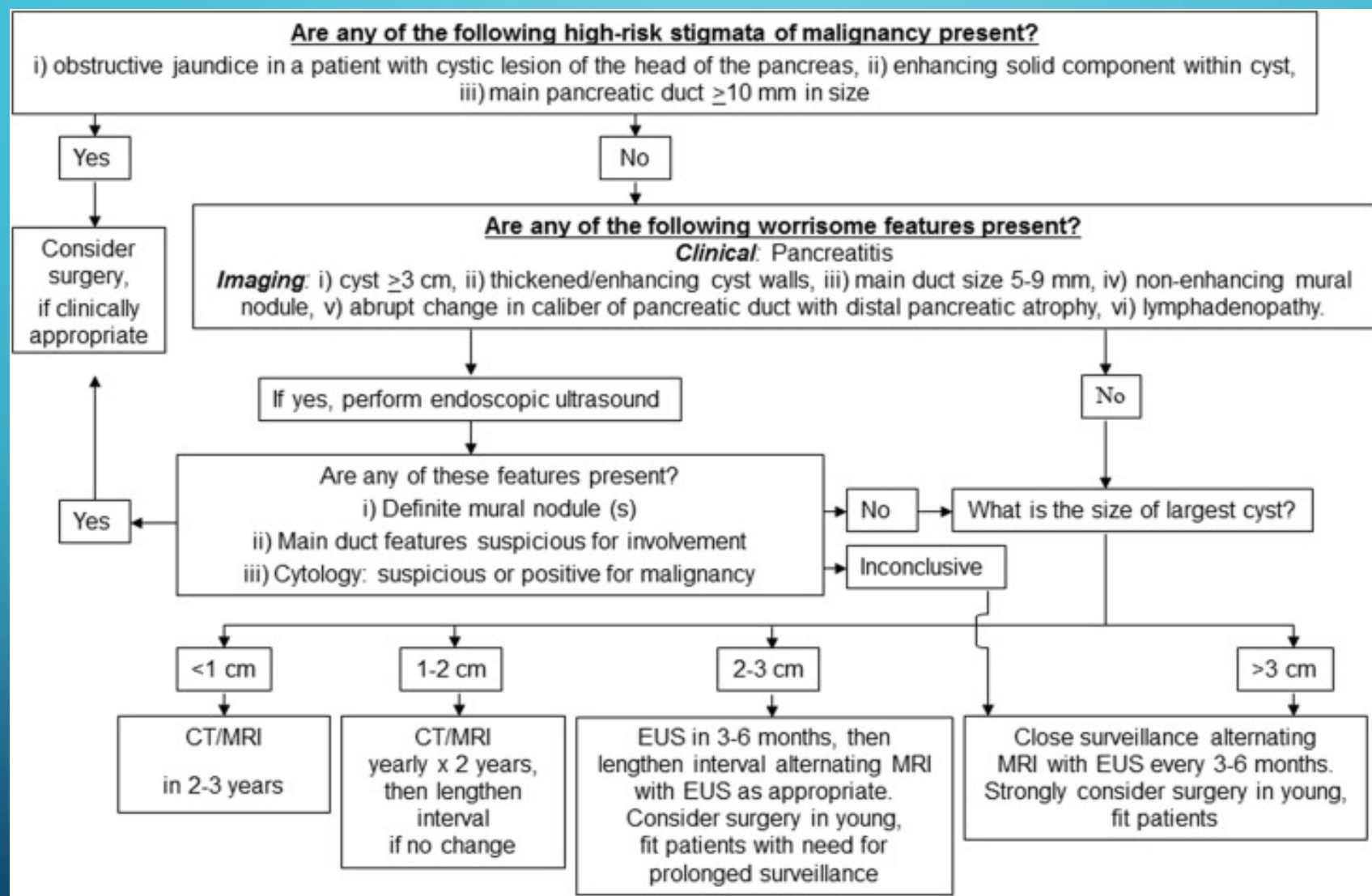
AGA, American Gastroenterological Association; *BD-IPMN*, branch duct–intraductal papillary mucinous neoplasm; *EUS*, endoscopic ultrasonography; *MCN*, mucinous cystic neoplasm; *MD-IPMN*, main duct–intraductal papillary mucinous neoplasm; *MPD*, main pancreatic duct; *SPN*, solid-pseudopapillary neoplasm.

*AGA does not recommend surgery for MPD alone, but also requires presence of a nodule or malignant cytologic features.

†Definite mural nodule, cytologic features positive for malignancy.

‡Relative indication for surgery according to European Guideline.

§Presence of thickened walls, intraductal mucin, or mural nodules is suggestive of MPD involvement; in their absence, MPD involvement is inconclusive.



SURVEILLANCE

- MRCP test of choice
- Interval of screening controversial
- EUS next step if equivocal/worrisome findings
- Direct referral to HPB surgery based on cross sectional imaging alone if high risk features.
 - Size
 - Nodularity
 - MPD dilatation $>10\text{mm}$



THANK YOU