

# Pancreatic cystic lesions

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## Pancreatic cystic lesions- Introduction

- Large increase in PCLs in recent years.
- Due to improvement in imaging, increased awareness & aging population
- Prevalence of PCLs ranging from 1.2% to 19%
- A majority of the patients have no history of pancreatitis
- PCLs: classified into non-neoplastic and neoplastic cysts
- Neoplastic cysts: commonly defined as pancreatic cystic neoplasms (PCNs)
- In general, non-neoplastic cysts account up to 80% of all PCLs
- However, the rate of PCNs increases significantly with age

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### Classification of pancreatic cystic lesions (PCLs)

#### Non-neoplastic cysts

- Pseudocyst
- Simple or congenital cyst

#### Neoplastic cysts [pancreatic cystic neoplasms (PCNa)]

##### Mucinous cystic lesions

- Intraductal papillary mucinous neoplasm (IPMN)
- Mucinous cystic neoplasm (MCN)

##### Non-Mucinous cystic neoplastic lesions

- Serous cystic neoplasm (SCN)
- Solid-pseudopapillary neoplasm (SPN)
- Cystic neuroendocrine neoplasm
- Acinar-cell cystic neoplasm

##### Other neoplastic lesions

- Ductal adenocarcinoma with cystic degeneration

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## Pseudocysts, EUS

- Early fluid collections associated with acute pancreatitis will not be surrounded with a wall
- Whereas pseudocysts are often surrounded by a thick, hyperechoic rim
- Calcifications in a cyst wall are highly suggestive of a mucinous cystadenoma, rather than a pseudocyst
- Debris in the dependent portion of the cavity is common and may represent blood, infection, or necrotic material
- Color Doppler of the wall will often reveal multiple, prominent vessels, including paragastric varices
- EUS guided FNA with cyst fluid analysis will differentiate between pseudocysts and neoplastic cysts in more than 90% of patients

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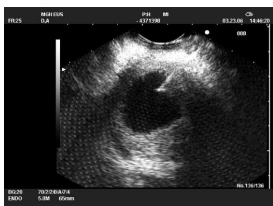
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## Pseudocysts, EUS

- A high concentration of amylase in aspirated fluid is predictive of a connection with the main pancreatic duct
- It helps confirm the diagnosis of a pseudocyst
- Pseudocysts should have relatively low levels of CEA
- This might be helpful for differentiation from IPMN and MCN
- The aspirated fluid is examined cytologically for degenerative debris, inflammatory cells and histiocytes
- If there is cytologic evidence of epithelial cells with the cyst fluid, this should raise the suspicion of a cystic neoplasm rather than a pseudocyst

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## Pancreatic cystic neoplasms (PCNs)

- The four major types of PCNs are:
- Intraductal papillary mucinous neoplasms (IPMN), mucinous cystic neoplasm (MCN), serous cystic neoplasm (SCN) and solid-pseudopapillary neoplasm (SPN)
- The proportion of PCNs varies with population
- In the Western Hemisphere, SCNs account for 32% to 39%, MCNs for 10% to 45%, IPMNs for 21% to 33%, and SPNs for less than 10% of all PCNs
- A nationwide survey from Korea reports: IPMNs (41.0%), MCNs (25.2%), SPNs (18.3%), SCNs (15.2%), and others (0.3%)

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## Intraductal papillary mucinous neoplasms (IPMN)

- ERCP was the standard diagnostic tool for IPMN in the past
- In MD-IPMN, the hallmark finding is a diffusely dilated main pancreatic duct with filling defects correlating to mucinous filling or papillary tumors
- For BD-IPMN, the affected branch ducts are cystically dilated and communicate with the main pancreatic duct
- In some occasions, the cystic side branch ducts do not fill with contrast due to mucus plugging
- In some cases, duodenoscopy during ERCP reveals a patulous duodenal papilla and mucin extrusion through the orifice
- The use of ERCP for the diagnosis of IPMN is limited by its invasiveness and risk of complications

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## IPMN, EUS

- EUS findings of IPMN include segmental or diffuse, moderate to marked dilatation of the main PD
- Often associated with intraductal nodules in MD-IPMN
- Obstruction of the main pancreatic duct with mucus can result in parenchymal changes
- The pancreas may appear to be enlarged and may show signs of pancreatitis, or pancreatic parenchymal atrophy
- Because of these changes, it is sometimes difficult to differentiate IPMN from chronic pancreatitis

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## IPMN, EUS

- EUS also allows for FNA of cystic lesions for biochemical, cytological and DNA analysis that might be further helpful for diagnosis and differentiation
- Macroscopically, highly viscous fluid is the first clue that the cyst is likely IPMN or MCN
- High concentration of CEA reflects the presence of a mucinous epithelium and it is elevated in both IPMNs and MCNs
- Thus, it is mainly beneficial to distinguish mucinous cysts from non-mucinous
- It does not differentiate IPMNs from MCNs or benign IPMNs from malignant IPMNs

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## IPMN, EUS

- A cut-off CEA level of 192 ng/mL has the sensitivity of 73%, specificity of 84%, and accuracy of 79% for differentiating mucinous from non-mucinous PCLs
- Among all the cyst fluid diagnostic parameters, CEA concentration alone is the most accurate test for the diagnosis of cystic mucinous neoplasms
- Due to connectivity to the pancreatic ductal system, amylase level may be elevated in IPMNs
- However, the utility to differentiate IPMNs from other PCLs is not clear

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## Mucinous cystic neoplasms (MCNs)

- EUS findings of MCN are thin-walled, septated fluid-filled cavities with diameter greater than 1 to 2 cm
- Duct communication is rarely seen
- Increased size, cyst-wall irregularity and thickening, intracystic solid regions, or an adjacent solid mass are findings suggestive of malignancy
- Cyst CEA levels are high as a result of secretion by the mucinous epithelium
- As mentioned, it is difficult to distinguish MCN from IPMN on the basis of cyst fluid cytology

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### **Serous cystic neoplasms (SCNs)**

- On EUS, the typical SCN has multiple small, anechoic cystic areas and thin septations
- Because of the vascular nature of the SCN, aspirants from EUS-FNA may be bloody or contain hemosiderin-laden macrophages
- Aspirated cyst fluid is low in CEA concentration
- The yield of cytology with EUS-FNA is poor

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### **Solid-pseudopapillary neoplasms (SPNs)**

- On EUS, SPNs are usually well-defined, hypoechoic masses
- They may be solid, mixed solid and cystic, or cystic
- Internal calcifications can be seen in some patients
- The reported diagnostic accuracy of EUS-FNA for SPN based on cytology and immunohistochemistry is 65%
- Aspirated cyst fluid may display necrotic debris
- The cyst fluid CEA is low, reflecting the presence of nonmucinous epithelium

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### **General approach to pancreatic cystic lesion (PCL)**

- Once confronted with a PCL, the first step is to differentiate PCNs from pseudocysts
- The diagnosis of pseudocysts is primarily based on a patient history compatible with pancreatitis, with additional information from biochemical and imaging features
- However, patients with PCNs may present with pancreatitis; patients with pseudocysts may have no apparent history suggestive of pancreatitis
- Once pseudocysts have been excluded, the type of PCN should be determined

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## General approach to pancreatic cystic lesion (PCL)

- The primary focus should be on differentiating between mucinous (IPMN and MCN) and serous (SCN) cysts
- Once a mucinous cyst has been diagnosed, patients with MD-IPMN, combined-type IPMN, and MCN should undergo a surgical consultation
- Patients with BD-IPMN should be managed using the algorithm of the consensus guideline
- SCNs should be observed, unless they are symptomatic or large (>4 cm)

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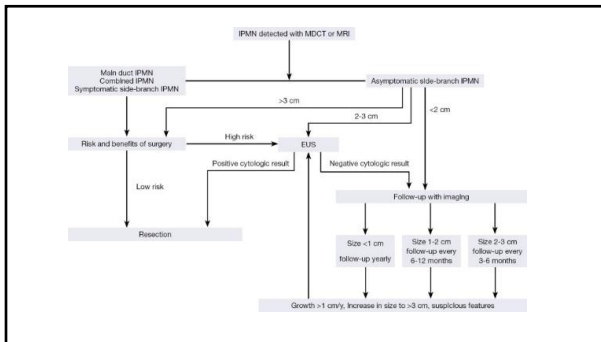
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