Incidental pancreatic cysts – Types, tests and treatments

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EDITORIAL

Advancements in the quality of cross-sectional imaging, alongside the increase in availability and use of computerized tomography (CT) and magnetic resonance imaging (MRI), have all contributed to the detection of more incidental pancreatic cystic lesions. Gore et al., state the incidence of an incidental cystic pancreatic mass on abdominal CT ranges between 1.2-2.6% and between 13.5-19.9% on abdominal MRI (1).

The nature of cystic pancreatic masses varies from benign (serous cystadenomas [SCs]), inflammatory (pancreatic pseudocysts), indolent lesions to potentially cancerous lesions (intraductal papillary mucinous neoplasms [IPMNs], and mucinous cystic neoplasms [MCNs]) and highly malignant cancers (cystadenocarinomas). Due to this broad risk profile, there is a need for careful investigation and to establish an accurate diagnosis.

All patients with a cystic pancreatic mass should be subjected to a detailed clinical history and a thorough physical examination. A history of abdominal trauma or one suggestive of recent pancreatitis, especially with evidence of alcohol abuse or gallstone disease, increases the likelihood that the lesion is a pseudocyst.

Imaging modalities utilized for characterization of cystic pancreatic lesions include: CT (with intravenous contrast), MRI (with intravenous contrast), magnetic resonance cholangiopancreatography (MRCP) and endoscopic ultrasound (EUS). CT provides 56-85% accuracy when used to characterize pancreatic cysts, and morphological features on imaging are used to aid diagnosis as outlined in Table 1 (2). MRI often provides greater diagnostic prowess compared to CT. It depicts the internal structure and cystic elements of pancreatic lesions more clearly and the use of MRCP aids the assessment of pancreatic duct involvement (3).

An adjunct to imaging characterization of pancreatic cysts is cyst aspiration fluid obtained during endoscopic ultrasound. Nevertheless, the ability to perform this investigation may be limited by small, inaccessible cysts. Considerably raised amylase levels (>250 u/L) in the aspirate suggest the presence of a pseudocyst, while MCNs and IPMNs can be diagnosed by high levels (>192 ng/mL) of carcinoembryonic antigen (CEA), high fluid viscosity and a high mucin content. In addition, SCs are found to have abundant levels of glycogen (2,4) (Table 1).

Management of cystic pancreatic lesions is complex but can be generalized into symptomatic and asymptomatic lesions. Severely symptomatic pseudocysts, or those that are persistent on serial imaging, often warrant intervention by means of percutaneous, endoscopic or surgical drainage. Other symptomatic cystic pancreatic lesions often necessitate treatment with referral to a surgeon for consideration of surgery. Cases referred to a surgeon may not always result in resection, as the benefits of surgery must be balanced against potential morbidity and mortality; and in some patients a conservative approach with serial imaging may provide a better prognosis.

Asymptomatic lesions require a different approach which often requires an assessment of the lesions malignant potential. Pseudocysts and SCs are regarded as having no malignant risk, but MCNs and IPMNs have a significant risk of malignant transformation. 6-36% of MCNs are found to be malignant in nature whereas side-branch and main duct IPMNs carry a risk of malignant transformation of 6-46% and 57-92% respectively (2).

TABLE 1

Summary of the imaging characteristics and cyst aspirate values, associated with common cystic pancreatic lesions

Cyst Features	Pseudocyst	Serous Cyst-adenoma (SCs)	Mucinous Cystic Neoplasm (MCNS)	Intraductal Papillary Mucinous Neoplasm (Side Branch)	Intraductal Papillary Mucinous Neoplasm (Main Duct)
Cyst Shape	Variable	Lobulated	Oval	Bunch of Grapes	Diffuse Pancreatic Duct Dilatation
Cyst Wall	Present (usually thin but can be thick if infected)	Present (thin)	Present (most commonly thick)	Present	Absent
Cyst Loculation	Unilocular	Microcystic (>6 loculations, each <2 cm)	Macrocystic (<6 loculations, each >2 cm)	Macrocystic (<6 loculations, each >2 cm)	NA
Communication with the Main Pancreatic Duct	Uncommon	Absent	Absent	Usually present as a channel	Present
Cyst Calcifications	Uncommon	Central	Peripheral	Uncommon	Uncommon
Central Scar within the cyst	Absent	Present	Absent	Absent	Absent
Aspirate Amylase	High (>250 u/L)	Usually low	Variable	Variable	
Aspirate CEA	Low	Low	High (>192 ng/mL)	High (>192 ng/mL)	
Aspirate Viscosity	Low	Low	High	High	
Aspirate Mucin	Low	Low	High	High	
Aspirate Glycogen	None	Elevated	None	None	

Cysts with a solid component are also considered to have a high malignant potential and so are preferably managed with surgical resection. Cyst size is another important consideration when contemplating a management plan; the exception being in the management of main duct or mixed variant IPMNs where resection should always be advocated regardless of the size due to the almost indefinite risk of malignancy (5).

Guidelines published by the American College of Radiologists suggest that side branch IPMN and MCN cysts with a diameter <3 cm can generally be managed with serial MRI/MRCP, whereas MCNs and side-branch IPMNs >3 cm, and SCs >4 cm; should be considered for surgery. Cysts <2 cm, with no evidence of growth on a MRI 1 year after diagnosis, are likely to be benign and follow up is not warranted. Follow-up MRI scans every 6 months, annually or every 2 years, should be encouraged for 2-3 cm side-branch IPMNs, MCNs and SCs respectively (4). Conversely, many clinicians in the UK would argue that patients found to have a 2-3 cm SC should not be subjected to any follow

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up. The inherently low malignant potential of SCs means that follow up may not be cost-effective; and as clear UK guidelines do not exist, the role of surveillance in SCs is ambiguous.

In addition to cyst type and size, other risk factors for malignant transformation do exist. The presence of local lymphadenopathy, non-enhancing nodules, a thickened, irregular cyst wall or histological dysplasia make one worry that MCNs and side-branch IPMNs have a greater malignant potential (2,3). Specific to side-branch IPMNs, pancreatic duct dilatation > 6mm is a predictor of malignant potential; and specific to MCNs, the presence of cyst calcification and a high (>400 ng/mL) aspirate CEA level increases malignant risk (1,6). On the other hand, aspirate CEA levels have no correlation to the malignant potential of IPMNs (7).

In summary, when treating and formulating a management plan for cystic pancreatic lesions, it is important to establish a correct diagnosis. A focused history and thorough clinical examination aid differentiation of a pseudocyst from a true pancreatic cyst. Radiological cyst characteristics and fluid aspirates allow differentiation between the numerous subtypes of true pancreatic cysts. Surgical treatment is warranted for symptomatic cysts, those with a solid component, all main duct IPMNs, cysts > 3 cm and those with features suggestive of a higher malignant potential. Cysts that do not fulfill criteria for surgical referral can serially be monitored with cross sectional imaging.

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