



Review

What to do for the incidental pancreatic cystic lesion?

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ABSTRACT

Background: Incidental pancreatic cysts are identified in 1% of all patients undergoing CT scans of the abdomen for whatever reason. The aim of this review was to provide an overview of the current evidence relating to the investigation and management of these lesions.

Methods: PubMed was searched to identify relevant studies relating to the investigation and management of incidentally discovered pancreatic cystic lesions.

Results: Initial investigation of incidentally discovered pancreatic cysts should be with either specific pancreas protocol CT or contrast enhanced MRI with MRCP. The diagnostic yield of these investigations can be increased with the addition of EUS/FNA and cyst fluid analysis in appropriately selected patients. Surgical intervention may be indicated in otherwise fit patients who are identified as having mucinous neoplasms.

Conclusion: Applying a systematic approach to the investigation of incidentally discovered pancreatic cysts means that in the majority of cases cyst aetiology can be accurately determined and appropriate management plans developed.

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List of abbreviations: CT, computed tomography; MRI, magnetic resonance imaging; MRCP, magnetic resonance cholangiopancreatography; EUS, endoscopic ultrasound; PET, positron emission tomography; SCN, serous cystic neoplasm; MCN, mucinous cystic neoplasm; IPMN, intraductal papillary mucinous neoplasm; 18-FDG, 18-fluorodeoxyglucose; FNA, fine needle aspiration; CEA, carcinoembryonic antigen; CA 19-9, carbohydrate antigen 19-9; miRNA, micro RNA.

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Introduction

Incidental pancreatic cysts are common findings on cross sectional imaging when performed for unrelated indications. A review of over 24,000 CT scans performed in one institution over a 7 year period identified incidental pancreatic cysts in approximately 1% of patients [1]. The differential diagnosis of these lesions is extremely varied but they can be classified broadly as neoplastic and non-neoplastic lesions. A simple classification of neoplastic lesions is shown in Table 1. Of these lesions serous, mucinous and intra ductal papillary mucinous neoplasms are by far the most common lesions encountered and will be the focus of this review.

Evaluation of the incidental pancreatic cyst

Clinical evaluation of the incidental pancreatic cyst

Not all cystic lesions of the pancreas require surgical intervention therefore accurate assessment and diagnosis is essential. The first step in this process is to take an accurate and detailed history along with a thorough clinical examination. Alarm symptoms such as pain, weight loss and jaundice are suggestive of a malignant process and should lead to an urgent surgical review [2]. A recent history of pancreatitis, gallstone disease or alcohol excess may be more suggestive of an inflammatory aetiology. In the majority of patients there are either no relevant symptoms or the clinical findings alone are inconclusive and further investigation may be necessary (dependent upon patient co-morbidity).

Cross sectional imaging

The combination of ease of access and rapid imaging acquisition time make CT scanning the most widely used modality for first line assessment of pancreatic cystic lesions. Whilst cystic lesions may be diagnosed on a variety of CT protocols accurate assessment requires the use of a dedicated pancreatic protocol CT (usually a triple phase scan consisting of non-contrast, arterial and portal venous phases) [3]. It is generally recommended that MRI assessment of pancreatic cystic lesions incorporates MR cholangiopancreatography (MRCP) to enable the relationship of cystic tumours to the pancreatic ductal system to be accurately defined (see Table 2) [4].

Table 1
 Classification of neoplastic cystic lesions adapted from Katz et al. [28].

Serous Neoplasms	Serous cystadenoma Serous cystadenocarcinoma (<i>very rare</i>)
Mucinous Neoplasms	Mucinous cystic neoplasm Intraductal papillary mucinous neoplasm
Cystic variants of solid neoplasms	Neuroendocrine tumour Ductal adenocarcinoma Acinar cell tumour
Others	Solid pseudopapillary tumour Lymphoepithelial cyst

Endoscopic ultrasound

Over the last decade endoscopic ultrasound (EUS) has emerged as an alternative imaging technique for assessment of the incidentally discovered pancreatic cystic lesion. Despite widespread adoption of this imaging modality into clinical practice there is no convincing evidence of an improvement in morphological characterisation of pancreatic cysts as compared to conventional cross sectional imaging, although the quality of published studies is generally poor.

Kim et al. undertook a head to head comparison of MRI and EUS in 21 patients with cystic pancreatic lesions and were not able to demonstrate any difference in the sensitivity of the two imaging modalities for detection of key cyst features such as septation, the presence of mural nodules, main pancreatic duct dilatation or communication with the main pancreatic duct [5]. Similarly there appears to be no advantage to EUS, as compared with CT, for evaluation of cyst size although EUS does out perform both CT & MRI for demonstrating multifocal cystic lesions [6,7]. Contrast enhanced EUS and tissue elastography are recent advances that may serve to improve the diagnostic performance of this imaging modality.

One of the limitations of EUS is that image interpretation is very much user dependent. A study by de Jong et al. compared the interobserver interpretation of 40 EUS videos between 4 experts with extensive EUS experience. Whilst there was a moderate level of agreement in regard to the assessment of cyst features (septation, nodules, pancreatic duct communication and the presence of solid components) the level of agreement in regard to assessing the presence of malignancy was only considered to be fair and poor in determining the need for surgical intervention [8].

A real strength of EUS over conventional imaging modalities is the ability to perform needle aspiration of cyst contents for both cytological (FNA) and biochemical analysis the results of which can play a pivotal role in assessing cyst aetiology and determining subsequent management (Table 3). In a series of 154 patients who underwent surgical resection of pancreatic cystic lesions Khashab et al. reported that EUS and cyst fluid analysis combined with either

Table 2
 Summary of imaging findings for common pancreatic cystic lesions.

	Pseudocyst	SCN	MCN	IPMN
Characteristic cyst appearance	Unilocular cyst associated with evidence of pancreatitis	Multiple hypodense cysts with a fibrotic central scar	Unilocular cystic lesion with peripheral calcification	Polycystic irregular lesion
Communication with pancreatic duct	Occasionally	No	No	Yes
Features suggestive of malignancy		Very rare	Mural nodules size >4 cm	Mural nodules BD-IPMN lesion >3 cm Main pancreatic duct dilatation

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