Pancreatic cystic lesions: a pictorial review

Poster No.: C-0275
Congress: ECR 2016
Type: Educational Exhibit
Authors: D. Kurda¹, I. Athamneh², A. Al Adwan²; ¹Melbourne/AU, ²Amman/JO
Keywords: Neoplasia, Diagnostic procedure, MR, CT, Pancreas
DOI: 10.1594/ecr2016/C-0275

Any information contained in this pdf file is automatically generated from digital material submitted to EPOS by third parties in the form of scientific presentations. References to any names, marks, products, or services of third parties or hypertext links to third-party sites or information are provided solely as a convenience to you and do not in any way constitute or imply ECR's endorsement, sponsorship or recommendation of the third party, information, product or service. ECR is not responsible for the content of these pages and does not make any representations regarding the content or accuracy of material in this file.

As per copyright regulations, any unauthorised use of the material or parts thereof as well as commercial reproduction or multiple distribution by any traditional or electronically based reproduction/publication method ist strictly prohibited.

You agree to defend, indemnify, and hold ECR harmless from and against any and all claims, damages, costs, and expenses, including attorneys' fees, arising from or related to your use of these pages.

Please note: Links to movies, ppt slideshows and any other multimedia files are not available in the pdf version of presentations.

www.myESR.org
Learning objectives

To describe the common types of cystic pancreatic lesions and their cross sectional imaging features.
Background

The cystic pancreatic lesions are increasingly detected in today's radiology practice. They include a variety of neoplastic and non-neoplastic conditions which result in a range of clinical symptoms. Accurate radiological characterisation of such lesions are important as some of them might require surgical management, while others can simply be left alone [1].

Computed tomography (CT) is the diagnostic modality of choice for the initial detection and evaluation of such lesions. Magnetic resonance imaging (MRI) can accurately show the morphology of such lesions and as well as their relationship with the pancreatic duct.

The initial assessment of a pancreatic cyst should be directed toward exclusion of a pseudocyst, which is the commonest cause of pancreatic cystic lesion. Patients with pseudocysts generally have a history of acute or chronic pancreatitis, whereas those with cystic tumors most often lack such a history [1].
Findings and procedure details

Pseudocyst

Pseudocysts are the most common cystic lesions of the pancreas. All other cystic lesions, including cystic neoplasms, represent only 10%-15% of pancreatic cysts [2]. They are localized amylase-rich collections in the pancreas or adjacent tissues and surrounded by a fibrous wall that does not have an epithelial lining [3]. Pseudocysts are round or oval collection of fluid having smooth thin wall (or a thick wall with uniform thickness) (Figs. 1 and 2), with unilocular pattern more commonly seen than multilocular ones [2]. Calcification in the cyst wall can be seen as well. History of acute or chronic pancreatitis can usually be elicited. They can be treated conservatively if they are asymptomatic or less than 6 cm in diameter.

Several complications might arise from these lesions, including haemorrhage, infection, rupture or obstruction of adjacent abdominal organs.

Common pancreatic cystic neoplasms

Among the various types of such neoplasms, the following common ones will be discussed in this exhibit:

• Serous cystadenoma:

   These lesions usually occur in women older than 60 years age. Although mostly asymptomatic, but can present with vague abdominal pain or weight loss [2]. They typically appear to be composed of multiple cysts of varying size of up to 2 cm, with the lesion itself measuring in the range of a small size up to a very large one (more than 20 cm). Central stellate calcification, which can occasionally be seen, is characteristic of this cystic neoplasm (Fig. 3).

   On MRI, Serous cystadenomas usually appear as a cluster of small cysts without communication between the cysts and the pancreatic duct (Fig.4).

   Macrocystic or oligocystic serous cystadenoma is a variant of serous cystadenoma that is very difficult to differentiate from mucinous cystadenoma (Fig. 5) [4]. Pancreatic head
location and lack of wall enhancement favours serous cystadenoma over mucinous cystic neoplasms [5].

- **Mucinous cystic neoplasms (MCN):**

MCN are the commonest cystic neoplasms of the pancreas. They can be unilocular or multilocular, and they are commonly detected only after achieving a large size [2]. Solid papillary excrescences can sometimes be seen projecting into the inside of these lesion from the wall. Peripheral calcification can be seen in up to 25% of cases and can help differentiate MCN from serous cystadenomas. Multiple enhancing septations and solid intramural nodules are typical radiologic findings of mucinous cystic neoplasms (Fig. 6) [2].

There is a scope of mucinous cystic tumours from benign to malignant and it is usually not possible to confidently differentiate them on the imaging bases alone. MCNs require surgical resection due to their malignant potential [2].

- **Intraductal Papillary Mucinous Neoplasms (IPMN):**

These lesions are characterized by the papillary proliferation of pancreatic ductal epithelium and production of mucin. They typically occur in elderly patients and are more common in men. They characterized by cystic dilatation of a main or a side branch duct with thick mucous secretions.

IPMNs are classified into the main duct type, branch duct type, and combined type. The side branch type is commonly mistaken for mucinous cystic tumor or pseudocyst [2]; however, the typical location in the uncinate process, its grape-like appearance and the communication of the cyst with the duct on ERCP or MRCP help diagnose them [6]. The main duct IPMNs can be categorised according to whether they produce segmental or diffuse dilatation of the pancreatic duct (Fig. 7 and 8).

The type of the lesion is essential prognostically. Main duct types are likely to undergo malignant transformation (70%), while about 15% of the side branch IPMNs have malignant potential [7].

- **Solid pseudopapillary tumours (SPT):**

These lesions are uncommon with low malignant potential and favourable prognosis. They mostly occur in young female patients, where they may present with non specific symptoms of nausea, vomiting and abdominal pain, or can be found incidentally throughout the pancreas [2].
On CT (Fig. 9), they appear as large encapsulated lesions, with solid and cystic components. The solid component is usually seen peripherally and enhances following contrast injection. The cystic component is a result of tumour degeneration. On MRI, SPNs are heterogeneous on both T1 and T2 (due to intralesional hemorrhage) and characteristically exhibit a low signal fibrous capsule [2] (Figs. 10 and 11).
Fig. 1: Pancreatic pseudocyst: Enhanced CT of the abdomen shows a unilocular cystic lesion in the pancreas with peripheral calcifications. This patient had prior history of acute pancreatitis.

© Royal Medical Services, Jordan
**Fig. 2:** Pancreatic pseudocyst: Coronal enhanced CT shows the cystic pancreatic lesion with very thin (imperceptible) wall and no septation.

© Royal Medical Services, Jordan
Fig. 3: serous cystadenoma: Unenhanced CT of the abdomen showing multiseptated cystic lesion in the pancreas with central calcification, characteristic of the condition.

© Royal Medical Services, Jordan
Fig. 4: Serous cyst adenoma: MRCP showing the typical microcytic nature of serous cyst adenoma (red arrow) in this 84 years old lady. There is no pancreatic duct dilatation as well as lack of communication of the lesion with the duct is noted.

© Royal Medical Services, Jordan
Fig. 5: Macrocystic cystadenoma: This enhanced CT shows a large unilocular cystic lesion in the tail of the pancreas. Histology revealed macrocystic serous cystadenoma.

© Royal Medical Services, Jordan
**Fig. 6:** Pancreatic mutinous cyst adenocarcinoma: Contrast enhanced CT of the abdomen shows a large multiseptated cystic lesion in the pancreas, with thick enhancing septations and peripheral calcifications.

© Royal Medical Services, Jordan
**Fig. 7:** Main duct IPMN: the enhanced CT shows diffuse dilatation of the main pancreatic duct with preservation of the parenchyma.

© Royal Medical Services, Jordan
**Fig. 8:** IPMN, main duct type: Axial T2 MRI shows diffuse dilatation of the main pancreatic duct.

© Royal Medical Services, Jordan
**Fig. 9:** Solid pseudopapillary tumor of the pancreas: Enhanced CT of the abdomen shows a large heterogenous lesion in the tail of the pancreas with solid and cystic components, it has significant mass effect on the surrounding structures.

© Royal Medical Services, Jordan
**Fig. 10:** SPN: Axial T2 image shows heterogenous well defined lesion in the tail of the pancreas of this 37 years old female patient. Note the characteristic low signal wall.

© Royal Medical Services, Jordan
Fig. 11: SPN: Axial T1 of the patient in Fig. 10, shows the lesion to contain areas of high signal intensity (red arrows) in keeping with intrallesional haemorrhage.

© Royal Medical Services, Jordan
Conclusion

With increasing use of multimodality imaging, the detection of cystic lesions in the pancreas has risen. Radiologist plays a pivotal role in the detection and characterisation of such lesions. Pseudocysts remain the most common among these lesion. Nevertheless, other important cystic neoplasms should be thought of, especially in the case of absence of prior history of pancreatitis or pancreatic trauma. Multimodality imaging is crucial in characterisation of these lesions.
References


