Symposium II

Radiologic Characterization and Differential Diagnosis of Pancreatic Cystic Neoplasms

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Cystic pancreatic lesions are being detected with increasing frequency at cross-sectional imaging due to the development of MDCT and MR technology, and increasing use of these imaging tools. The most common cystic pancreatic lesions are pancreatitis-related pseudocysts. However, when a diagnosis of pancreatitis is excluded, cystic neoplasms should be considered.

The majority of cystic pancreatic tumors have characteristic imaging features. In addition to patient age, sex and various comorbidities, the management of cystic pancreatic tumors largely depends on their imaging characteristics, including tumor size, location, internal component, and the presence of a solid component.

Pseudocyst vs. Non-pseudocyst

Postinflammatory pseudocysts are the most common cystic lesion of the pancreas and it is very important to differentiate pseudocysts from true cystic tumors of pancreas. Pancreatic pseudocysts are the collections of amylase-rich fluid in and around the pancreatic parenchyma and they are surrounded by fibrous wall without epithelial lining. On CT, pancreatic pseudocysts are thin walled, oval or round fluid collection; however, the wall is sometimes thick and well-enhanced. Clinical history of pancreatitis is the most valuable diagnostic clue. Pancreatic pseudocysts are usually unilocular cysts; however, multilocular cysts could be developed. As complications, hemorrhage, rupture and infection can be accompanied. On MRCP, communication to the pancreatic duct could be visualized, however, IPMNs also have the communication, and therefore, without history or imaging findings of pancreatitis, differentiation might be difficult. Follow-up or aspiration of the fluid could be helpful for diagnosis.

Common Cystic Pancreatic Neoplasms

1. Serous cystadenomas

Typical serous cystadenomas are composed of multiple cysts (>6) of varying size, from a few mm up to 2 cm. External lobulations and a stellate pattern are commonly present. Fibrous central scars with or without stellate calcifications are seen in 30% and highly specific. The fibrous portion shows enhancement on CT or MRI and important distinguishing feature. Microcystic tumors could be seen as solid tumors on CT; however, T2WI of MRI can demonstrate microcysts as bright signal structures. Occasionally, serous cystadenomas may be seen as macrocystic or oligocystic variants and may be difficult to differentiate from MDCT. Multicystic, lobulating appearance are imaging finding in these cases comparing to smooth cysts of mucinous cystic neoplasms.

2. Mucinous cystic neoplasms (MCN)

Mucinous cystic neoplasms are more common in body and tail of pancreas and typically unilocular but can also be multiloculated, containing six or fewer cysts measuring greater than 2 cm. They present as well-encapsulated masses with various intracystic appearance depending on their contents (debris, hemorrhage). Enhancement of the cyst wall or septa may be seen. There is no communication to pancreatic duct; however, MCN can be the cause of partial pancreatic duct obstruction. Peripheral eggshell calcifications are found in 10-25% and pathognomotic and suggest malignancy. MR can be helpful to demonstrate internal contents. Mucinous cystadenocarcinoma may be

very locally aggressive, with extensive invasion of adjacent tissues. The presence of solid component, thick wall/septa and peripheral calcifications are suggestive of malignancy.

3. Intraductal papillary mucinous neoplasms (IPMN)

IPMN can be classified as main duct, branch duct, and combined type. Main duct type of IMPN is characterized by segmental or diffuse dilatation of the main duct. Branch duct type of IPMN appears as a cluster of small cysts with lobulated margins and septations. An imaging diagnosis of branch duct type IPMN depends on identifying the communication of the cysts to the main pancreatic duct and this communication is generally best demonstrated by MRCP.

Malignancy is more common in main duct type and combined type than branch duct type. Imaging findings of IPMN suggestive of malignancy include marked dilatation of main pancreatic duct, solid mass, diffuse or multifocal involvement, large tumor size in branch duct type or combined type (5 cm), thickening of the wall or septa in the branch duct type, widely open orifice of the papilla of Vater on ERCP, and attenuating or calcified intraluminal content.

4. Solid pseudopapillary tumor (SPT)

SPT is usually a large, encapsulated mass consisting of cystic and solid components. Thick, well-defined walls are typical. Radiological imaging shows internal heterogeneity due to hemorrhage and necrosis and these are prominent on MR T1WI.

Rare Cystic Pancreatic Neoplasms

Cystic change of solid tumors could be found in endocrine tumors, adenocarcinomas, acinar cell carcinomas or metastases.

References

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