Diagnostic Evaluation of Pancreatic Cystic Malignancies

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KEYWORDS

• Pancreas • Pancreatic cyst • Cystic neoplasms
• Pancreatic malignancy

Pancreatic cystic neoplasms despite increased recognition remain rare and represent approximately 10% to 15% of primary cystic masses of the pancreas.[1–3] Many pancreatic cysts are discovered incidentally during the workup for abdominal pain, diarrhea, and other nonspecific gastrointestinal symptoms and represent a frequent clinical referral in tertiary academic centers with pancreatic expertise. Not surprisingly the increase in the diagnosis of a pancreatic cystic mass parallels that of the improved number and type as well as the improved overall sensitivity of cross-sectional imaging studies used in routine practice today.[4] It is important for today's practicing physician to be aware of these increasingly recognized neoplasms on radiologic imaging and more importantly to understand the potential for the presence or development of pancreatic malignancy in a certain subset of these lesions, particularly in those presenting with symptoms or in whom symptoms develop.

CLASSIFICATION

The classification of cystic pancreatic neoplasms has its roots in the surgical, radiologic, and perhaps most importantly in the clinical pathologic literature and dates from the mid to late 1970s.[5,6] The distinction between serous and mucinous cystic neoplasms was first realized at that time and despite many modifications and attempts at radiologic,[7] endoscopic,[8] and more recently with newer laboratory-based analysis using techniques such as mass spectrometry[9] and DNA analysis,[10] remains intact and a solid initial clinical approach to these neoplastic lesions even today. Our understanding of mucinous cystic neoplasms has evolved and since the early 1980s

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the clinical entity we now recognize as intraductal papillary mucinous neoplasm (IPMN) was first described in the literature.[11] IPMN remains an important "lesion of clinical distinction" when evaluating pancreatic cystic neoplasms and is recognized as a distinct histopathologic entity in the World Health Organization histologic classification system (**Table 1**).[12] Indeed, awareness regarding IPMN recognition and diagnosis has increased so much in recent years that the entity originally known as the IPMN is now further subdivided into main and side-branch IPMN lesions, respectively, each with different clinical, endoscopic, and radiologic presentation, and perhaps most importantly, with different biologic behavior, particularly involving malignant transformation.

MALIGNANT POTENTIAL OF PANCREATIC CYSTIC NEOPLASMS

The incidentally discovered pancreatic cystic neoplasm not only represents an alarming clinical discovery but for the affected patient in many instances represents a precancerous condition with a great deal of uncertainty regarding management. The discussion regarding malignant potential focuses mainly on the distinction between IPMNs and mucinous cystic neoplasms (MCNs). Serous cystadenomas are largely benign lesions although case reports of malignant transformation do exist and as such are often managed nonsurgically. Solid pseudopapillary tumors have a fairly well-defined behavior and malignant risk and are often managed surgically.

The distinction between IPMN lesions and MCN lesions remains a controversial topic and relies on several clinical and pathologic factors. Clinical factors include patient age, location of the cyst, cyst characteristics, and relationship to the main pancreatic duct. As is described in more detail later, main duct IPMNs are found most often in male patients in their 60 or 70s and are more often than not found in the pancreatic head/neck region, whereas side-branch IPMN lesions are not sex specific and tend to be well distributed throughout the pancreas. Main-branch IPMNs appear grapelike on imaging including EUS and appear as individual cysts rather than the cyst within a cyst characteristic seen in MCNs. IPMN lesions also communicate with the pancreatic duct, a feature not seen in MCNs. MCNs in comparison are often seen in women in the 40- to 50 -year age range and are located most often in the pancreatic body and tail regions.

Pathologically, the best-studied differentiation criterion involves the presence of ovarian-type stroma on histologic analysis.[5,13] The presence of ovarian-type stroma

Table 1
Histologic classification of neoplastic pancreatic cysts

Serous cystic tumors	Serous cystadenoma Serous cystadenocarcinoma (rare)
Mucinous cystic tumors	Mucinous cystadenoma Mucinous cystadenoma with moderate dysplasia Mucinous cystadenocarcinoma Noninfiltrating Infiltrating Intraductal papillary mucinous adenoma IPMN with moderate dysplasia Intraductal papillary mucinous carcinoma Noninfiltrating Infiltrating
Solid pseudopapillary tumors	