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My Treatment Approach: Pancreatic Cysts

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Abstract

Our treatment approach for either symptomatic or incidentally found pancreatic cysts continues to improve. The true incidence of pancreatic cysts is not known, and pancreatic cystic neoplasms, especially intraductal papillary mucinous neoplasms, are currently most commonly diagnosed and resected. This is a result of increasing awareness, widespread availability of imaging, and better understanding of the nature of pancreatic cysts as well. Recent studies on molecular analysis and devices such as microbiopsy forceps help us better define and select the treatment approach to alleviate symptoms and to prevent malignant tumors while avoiding unnecessary surgery.

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Pancreatic cysts are found with increasing frequency, especially in asymptomatic and elderly patients, because of increasing awareness and widespread use of high-resolution cross-sectional imaging.[1] The incidence of pancreatic cysts in the US population is estimated to be between 3% and 15%; however, the true incidences of these lesions are not known because most results are based on surgical series or image-based studies.[2] In an autopsy series, pancreatic cysts were found in 24.3% of autopsy cases (73 of 300).[3] Pancreatic cysts were incidentally detected in 3% of computed tomography (CT) scans and 20% of magnetic resonance imaging (MRI) scans. The prevalence increases with advancing age, up to 10% to 40% over 80 years.[4,5] A nationwide Korean survey reported that intraductal papillary mucinous neoplasms (IPMNs) account for 41%, mucinous cystic neoplasms (MCNs) for 25.2%, solid pseudopapillary neoplasms (SPNs) for 18.3%, serous cystic neoplasms (SCNs) for 15.2%, and others for 0.3% of the pancreatic cysts.[6] The current identification of smaller cysts reported to have a malignant potential creates anxiety and the need for further medical evaluation. Patients with pancreatic cysts have an observed incidence of pancreatic cancer 22.5 times higher (99.5% CI, 11.0-45.3) than that of the expected mortality from pancreatic cancer in the general Japanese population.[7] In contrast, the 2015 American Gastroenterological Association (AGA) technical review on asymptomatic neoplastic pancreatic cysts reported an estimated incident risk of malignant tumor of incidental pancreatic cysts at 0.24% per year and with a prevalent malignant risk of 0.25% at the time of diagnosis.[8] These data indicate that although pancreatic cysts can be asymptomatic at the initial presentation, they may develop into cancer, and malignant tumor risk is higher in patients with pancreatic cysts than in the healthy population without pancreatic cysts.

Pancreatic cysts can be broadly classified as either nonneoplastic or neoplastic cysts (current name is pancreatic cystic neoplasms [PCNs]) (Table 1). Histologically, nonneoplastic pancreatic cysts are better categorized as nonepithelial (pancreatic pseudocyst [PP] is the most common) and epithelial (retention cyst is the most common) cysts. In contrast, PCNs are mainly divided into mucinous and nonmucinous cystic lesions.

This review article discusses the clinically common and important types of pancreatic cysts, their diagnostic strategies, and treatment options. The distinction between PCNs and nonneoplastic cysts are also discussed in our management approach, because PCNs carry a current or future malignant tumor risk.

NONNEOPLASTIC CYSTS

Nonneoplastic cysts of the pancreas are benign lesions without malignant potential, but they are sometimes indistinguishable from PCNs. Although they are rare, the recognition of these cysts is important to avoid an unnecessary pancreatic resection. Nonepithelial cysts include PPs and infection-related cysts,[9]

TABLE 1. Common Types of Pancreatic Cysts

A. Nonneoplastic pancreatic cysts
  1. Nonepithelial
    - Pancreatic pseudocysts
    - Infection-related cysts
  2. Epithelial
    - Retention cysts
    - Squamoid cysts
    - Lymphoepithelial cysts
    - Enterogenous cysts
    - Mucinous nonneoplastic cysts
    - Endometrial cysts
    - Para-ampullary duodenal cysts

B. Neoplastic pancreatic cysts
  1. Mucinous cystic lesions
    - Intraductal papillary mucinous neoplasms
    - Mucinous cystic neoplasms
  2. Nonmucinous cystic lesions
    - Serous cystic neoplasms
    - Solid pseudopapillary neoplasms
    - Pancreatic neuroendocrine tumors

whereas epithelial cysts include retention cysts, squamoid cysts, lymphoepithelial cysts, enterogenous cysts, mucinous nonneoplastic cysts, endometrial cysts, and para-ampullary duodenal cysts.[10-12] There is an uncertainty whether simple congenital cysts occur in the pancreas; however, these cysts are rare. Patients with cystic fibrosis may present with simple cysts within a diffuse atrophic fatty pancreatic parenchyma,[13] and patients with autosomal dominant polycystic renal disease and medullary cystic disease may have cystic transformation of the pancreas.[14,15]

Pancreatic Pseudocysts

The Atlanta classification of acute pancreatitis was revised in 2013, and the terminology to define inflammatory pancreatic fluid collections was updated and improved. According to the revised criteria, inflammatory pancreatic fluid collections were categorized as acute peripancreatic fluid collections, PPs, acute necrotic collections, and walled-off necrosis.[16] Pancreatic pseudocysts are often the result of an acute pancreatitis, and 10% of patients with acute pancreatitis develop a PP.[17,18] Chronic pancreatitis, penetrating trauma, and blunt trauma are other etiologies.

Pancreatic pseudocysts are mature fluid collections outside the pancreas, which develop 4 weeks after the onset of nonnecrotizing acute pancreatitis. Pancreatic pseudocysts have an enhancing capsule that does not contain an "epithelial lining" and the fluid inside the cyst is opaque, dark, and low viscosity without solid material.[19] Pancreatic pseudocysts are usually unilocular solitary cysts ranging from 2 to 20 cm in size.[19-21] They are generally sterile fluid collections but may become infected or hemorrhagic. The most common symptoms are abdominal pain, early satiety, and weight loss. A PP is suspected when abdominal pain continues or serum levels of amylase remain elevated after the clinical remission of pancreatitis.[22]

Cross-sectional imaging reveals a well-circumscribed fluid collection, which is usually round or oval. The fluid collection is completely encapsulated with a well-defined thick wall that is typically extrapancreatic; the fluid does not contain solid components and has a homogeneous fluid density.[16] Cross-sectional imaging may also reveal signs of pancreatic parenchymal inflammation due to pancreatitis. Endoscopic ultrasonography (EUS) reveals a hypoechoic fluid collection surrounded by a thick rim (Figure 1). When the cyst is aspirated with EUS-guided fine needle aspiration (EUS-FNA), the cyst fluid is high in amylase, low in carcinoembryonic antigen (CEA), and free of epithelial cells; however, histiocytes and inflammatory cells may be present.[23]

Most PPs resolve spontaneously[22-24]; however, endoscopic and percutaneous drainage are the choices of treatment in large symptomatic PPs. Currently, EUS-guided transgastric or transduodenal endoscopic drainage is the most preferred treatment, and surgical drainage is not preferred except in the case of endoscopic drainage failure. Although percutaneous drainage under ultrasonography/CT guidance has high short-term success, it has 29% risk of complications with marked discomfort to the patient. Endoscopic drainage is generally preferred.[23-27]

Retention Cysts

Retention cysts form as a result of cystic dilation of the pancreatic duct; they are usually found incidentally and have little clinical significance. Retention cysts can be either congenital or secondary to ductal obstruction