Pancreatic Cysts

Overview

Pancreatic cysts are fluid-filled structures in and around the pancreas. Although possible etiologies of pancreatic cysts are numerous, the most common are pseudocysts and cystic tumors.

Pseudocysts are not true cysts with epithelial lining, but are inflammatory, fibrous-walled, encapsulated structures that result from severe inflammation of the pancreas or pancreatic duct leakage. Patients with pseudocysts usually either have a known history of pancreatitis, or report current or prior symptoms that likely represent unrecognized pancreatitis.

Cystic tumors fall broadly into three groups:
- benign (serous cystadenoma)
- premalignant (mucinous cystadenoma and intraductal papillary mucinous tumor)
- malignant (cystadenocarcinoma)

It is important to distinguish pseudocysts from cystic tumors, and to characterize the type of cystic tumor, as this information subsequently impacts management.

Diagnostic Tools for Pancreatic Cysts

Pancreatic cysts are usually detected on radiological imaging studies, such as transabdominal ultrasound, CT scan or MRI. Cysts can be incidental findings on imaging tests done for other reasons, or found on imaging performed for related symptoms, such as abdominal pain.

Clinical presentation can help discriminate the etiology in some settings. Pseudocysts are usually associated with pancreatitis, and are often recognized on radiological studies performed during the evaluation of patients with abdominal pain. Conversely, cystic tumors of the pancreas are often asymptomatic and found incidentally on radiological imaging done for other purposes.

Distinguishing an inflammatory pseudocyst from a cystic tumor based on clinical presentation and radiological imaging alone is difficult, as some cystic tumors produce symptoms and signs of pancreatitis, and cystic tumors can appear identical to pseudocysts on imaging.

Endoscopic Ultrasound

Advancements in endoscopic technology and techniques have increased our ability to characterize the etiology of pancreatic cysts. Endoscopic ultrasound (EUS), a relatively new technology, uses an ultrasound probe at the tip of an endoscope to provide high-quality, detailed images of structures in and around the gastrointestinal tract. During the procedure, an echoendoscope is advanced into the stomach and duodenum to obtain detailed images of the pancreas.

Echoendoscope used to perform interventional procedures. A biopsy needle projects from the instrumentation channel.
Pancreatic cyst

Endoscopic ultrasound showing a portion of the pancreas and the cyst (in black), with a needle extending into it.

9 x 7 cm pseudocyst shown on CT scan.

On cytology, the presence of either atypical cells, mucin or mucin-secreting cells help distinguish malignant or potentially malignant cystic tumors from benign cysts. Findings from cyst fluid analysis also help predict the etiology of the pancreatic cyst.

For example, typical EUS and cyst fluid analysis findings for various pancreatic cysts are:

- **Pseudocyst**—thick-walled, debris filled cavity with high amylase level and low CEA
- **Serous cystadenoma**—thin-walled, microcystic structure with low amylase and low CEA levels
- **Mucinous cystadenoma**—macro-cystic, septated structure with low amylase and high CEA
- **Intraductal papillary mucinous neoplasm (IPMN)**—cystic dilation of side-branch or main pancreatic duct with high amylase and high CEA.

**Endoscopic Retrograde Cholangiopancreatography**

Depending on the diagnostic consideration, endoscopic retrograde cholangiopancreatography (ERCP) may also be considered. During ERCP a small catheter is inserted into the pancreatic duct through an endoscope and contrast media is injected to provide detailed radiographic images of the pancreatic ductal system. Miniature endoscopes and small intraductal ultrasound probes can also be placed directly into the pancreatic duct during ERCP to directly image the duct lining. These advanced ERCP techniques are particularly useful in evaluating patients with suspected IPMN.

EUS guided fine-needle aspiration (EUS-FNA) is also performed to obtain a diagnostic sample of cyst fluid. The fluid is submitted for cytologic examination and biochemical analysis for amylase and tumor marker levels (e.g. carcinoembryonic antigen-CEA). EUS also provides exquisitely detailed images of the cyst structure and contents, revealing the presence or absence of cyst debris, septations, nodularity, associated masses and communication with the pancreatic duct. All of these anatomic characteristics shed light on the cyst etiology.
Endoscopic Retrograde Cholangiopancreatography

The endoscope is passed through the mouth to the opening of the pancreatic duct in the duodenum.

Contrast is injected into the common bile duct and pancreatic duct.

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Treatment

Pseudocysts

Depending on symptoms, inflammatory cysts related to prior pancreatitis may require treatment. Worrisome symptoms that may prompt therapy include fever, chills, jaundice, nausea, vomiting, difficulty tolerating oral intake, or worsening abdominal pain. Such symptoms may indicate an enlarging cyst that is causing compression of adjacent structures, such as the stomach or intestine, or infection within the cyst.

Treatment of symptomatic pseudocysts consists of cyst drainage, which can be performed surgically, endoscopically or under radiologic guidance. The goal of these treatments is to decompress enlarging or infected pseudocysts, thereby alleviating symptoms. The specific drainage route used depends on a variety of factors including severity of pancreatitis and inflammation, concomitant medical conditions, and the anatomic location of the pseudocyst.

At California Pacific Medical Center, we use a multidisciplinary approach involving pancreatic surgeons, radiologists and interventional endoscopists to guide the optimal treatment approach for this complex condition.

Surgical Cyst Drainage

Operative drainage involves the creation of connections between the cyst and gastrointestinal tract (e.g. cyst-gastrostomy, cyst-duodenostomy) during laparotomy. In cases of pseudocysts associated with severe pancreatitis, infected or necrotic pancreatic tissue may be surgically removed to promote healthy healing.

Endoscopic Cyst Drainage

With this treatment, an endoscope is used to place stents through the stomach or duodenum, directly into the cyst cavity. EUS is used to ensure safe puncture into the pseudocyst. The tract is then dilated, enabling the endoscope to enter the cyst cavity for irrigation and removal of infected or necrotic tissue (often a sequelae of severe pancreatitis). Stents are then placed across the tract to allow internal drainage of pseudocyst contents into the gastrointestinal tract. Eventually these stents will migrate and pass spontaneously or will be removed endoscopically after resolution of the cyst.

Radiologic Cyst Drainage

Interventional radiologists may place percutaneous drainage tubes through the skin, into the cyst cavity, under image guidance. The cyst cavity may be irrigated, with fluid draining into an external collection bag that is removed after cyst resolution.

Cystic Tumors

All mucin-secreting cystic tumors of the pancreas are considered pre-cancerous. In fact, up to 15-20% of these tumors may already harbor cancerous cells at time of diagnosis. Standard therapy for these cystic lesions is surgical resection. Depending on the exact location of these cystic tumors, surgical options may include:

- Laparoscopic resection
- Segmental open resection
- Pyloric-sparing Whipple Procedure

Pancreas anatomy prior to a Whipple procedure. The blue represents structures that are removed during surgery for a cancerous cystic lesion.
Outcome of a Pyloric-sparing Whipple Procedure, which saves the pylorus section of the stomach in an attempt to improve digestion and nutrition.

For some smaller cystic tumors, laparoscopic pancreatic surgery may be an option. This procedure—currently being performed at only a few centers—uses small incisions within the abdomen through which surgeons insert surgical instruments to resect the pancreatic cyst(s). By using this minimally invasive procedure versus open surgery, individuals can benefit from a faster recovery, smaller incisions and a shorter hospital stay.

Why Choose Us

Hepatobiliary and pancreas diseases—disorders of the liver, bile ducts, gallbladder and pancreas—form a complex set of medical problems whose treatment often requires equally challenging minimally invasive or surgical procedures.

At California Pacific Medical Center, we have been leaders in hepatobiliary and pancreas disorders since the founding of our Liver Disease and Transplant Program in 1988. Our doctors are closely involved in clinical research and surgical innovation. Annually, our physicians provide care to some 4,000 hepatobiliary and pancreas patients, both in San Francisco and at our network of outreach sites in California and Nevada.

For patients requiring hospitalization, we have a dedicated critical care liver unit, hospitalists who specialize in hepatobiliary and pancreatic disease, physician assistants, on-call anesthesia staff and a specialized O.R. nursing team. At California Pacific, our focus is on providing experienced, personalized care for all patients.

For more information

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