

ADVANCES IN ENDOSCOPY

Current Developments in Diagnostic and Therapeutic Endoscopy

Section Editor: Todd H. Baron, MD

Endoscopic Ultrasound–Guided Ablation of Pancreatic Cysts



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G&H How prevalent are pancreatic cysts, and how are they typically diagnosed?

WB Approximately 2% of adults in the United States have cysts in the pancreas. These pancreatic cysts are diagnosed via computed tomography or magnetic resonance imaging scans of the abdomen. When the incidence is stratified by age, there is a steep increase in incidence after age 50 years that climbs steadily to age 80 years. Almost 10% of elderly patients have pancreatic cysts diagnosed by cross-sectional imaging. Although it is not certain that all of these cysts are intraductal papillary mucinous neoplasms (IPMNs), certainly a high percentage are premalignant in nature. Benign epithelial cysts of the pancreas are very rare.

G&H What endoscopic ablation techniques are available for the treatment of pancreatic cysts?

WB There are 2 general methods for ablation of pancreatic cysts. Both methods use endoscopic ultrasound to target the pancreatic cystic lesion and direct a needle into the cyst. Once the needle is in the cyst, endoscopists can either inject the cyst with a medication to ablate it, or they can deliver energy to burn off the cyst. Alcohol has traditionally been injected into cysts, but a combination of chemotherapy medication and alcohol can also be used. With alcohol injection therapy, the cyst is aspirated until it is nearly collapsed. The aspiration syringe is then replaced with an injection syringe. An equal volume of ethanol is injected into the cyst, followed again

by aspiration. This alternation between aspiration and injection is called lavage. With each cycle, the concentration of ethanol in the cyst increases. At the conclusion of the lavage, small amounts of ethanol are usually left in the cyst. The second, and newest, method for ablation of

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pancreatic cysts is radiofrequency ablation therapy. This method utilizes a machine that generates radiofrequency waves that travel down a needle, delivering energy into the cyst. The tissue then heats to a high temperature, which burns and kills the tissue and removes the cyst. Cyst ablation using radiofrequency has been evaluated only in 1 small study. Although most of the cysts in this study decreased in size, only a few were completely eliminated.

G&H What are the advantages and disadvantages of these endoscopic techniques compared with standard surgical treatment?

WB A major advantage of endoscopic ultrasound–guided ablation treatments is that they are relatively non-invasive, simple methods for removal or elimination of cysts compared with surgery. Surgery involves resection or removal of the segment of the pancreas that features the cyst rather than just the cyst itself. Typically, one-third of the pancreas needs to be removed with the surgical approach. Endoscopic ultrasound–guided ablation treatments are also generally associated with fewer risks compared with surgery. However, a major disadvantage with the endoscopic approach is that the ablation success rates are approximately 70% vs 100% with surgery. As such, ablation therapies sometimes need to be repeated 2 or 3 times in order to achieve complete ablation of the cyst.

G&H What adverse events are associated with ablation for the management of pancreatic cysts?

WB When delivering alcohol or chemotherapy into the cyst, there is a small risk (1%) of acute pancreatitis, which usually occurs when ethanol leaks out of the cyst and into the pancreatic parenchyma. Pancreatitis does not occur often, but when it does, it can be a very uncomfortable experience for the patient and may result in hospitalization for 1 to 2 days. Regarding radiofrequency ablation, heat is being delivered to the pancreas. If the heat remains within the cyst, generally the cyst can be eliminated without much risk. However, if the heat escapes out of the cyst and into the pancreas, it can also cause pancreatitis and associated pain. There are reports of a clot in a vein next to the pancreas following injection therapy, but that is a fairly rare complication. Venous thrombosis is likely a result of localized pancreatitis, and the clot can remain in place for several months.

G&H What have studies shown regarding the safety and efficacy of both of these ablation techniques?

WB Studies have shown that, in general, the long-term success rate with ablation therapy is not as high as the immediate effects. For example, 70% to 80% of cysts will disappear shortly following injection with alcohol or chemotherapy. The long-term success rates decrease to approximately 50%, meaning that the cysts do tend to grow back despite the ablation therapy. There have been a few patients who have undergone surgical resection of an ablated cyst, and the epithelium has been examined in detail. In most cases, there is extensive ablation of the epithelium, and some residual functional epithelium remained in place. The presence of the cyst and the

existence of the fluid within the cyst reflects a functional epithelium.

G&H Have any cost-effectiveness studies been performed on the use of endoscopic ultrasound–guided ablation for pancreatic cysts?

WB I am not aware of any cost-effectiveness studies, likely because the costs of injection or radiofrequency ablation are relatively low compared with surgery. However, because there is an approximately 50% chance that a cyst

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will grow back, additional ablation sessions may be necessary. In such instances, the effectiveness of ablation methods may not be significantly better than surgery. However, one of the advantages of cyst ablation is the ability to perform the therapy in high-risk, elderly patients. Instead of subjecting these patients to high-risk surgery, ablation therapy can be used to decrease the risk of malignancy over time.

G&H How should patients be followed up?

WB Patients with pancreatic cysts are typically followed using magnetic resonance imaging, specifically magnetic resonance cholangiopancreatography. This scan can clearly identify and accurately measure cysts without the radiation that is associated with computed tomography scanning. Magnetic resonance cholangiopancreatography has sufficient resolution to detect early cyst malignancy in the form of mural nodules. Once a mural nodule has been identified, the cyst should be examined in more detail, and mural nodules should be sampled with fine-needle aspiration.

G&H Are there any patients in whom endoscopic ultrasound–guided ablation is not recommended?

WB Ablation therapy is generally reserved for cysts that are at risk for malignancy, such as mucinous

cysts. Therefore, this treatment is not recommended in patients with serous cystadenomas, which are benign cysts of the pancreas with very low risk of malignancy. More importantly, pseudocysts of the pancreas should not be treated with ethanol ablation therapy because alcohol injection into a pseudocyst may cause significant pancreatitis. Large side-branch IPMN lesions with main duct communication may be at high risk for alcohol-induced pancreatitis. Thus, it is preferable to perform endoscopic ultrasound with fine-needle aspiration and cyst fluid analysis before performing ablation therapy.

G&H What are the priorities of research in this field?

WB The major priority is to identify the specific combination of chemotherapy and alcohol that will allow a maximum ablation rate with a minimal risk rate. For example, a recent study demonstrated that injection of gemcitabine into pancreatic cysts without alcohol can provide the same rates of ablation as with alcohol. Based on this finding, many physicians now believe that alcohol is not necessary for ablation therapy and, without alcohol, perhaps the complication rates of ablation therapy will be lower. Additionally, only 1 US study has been performed on radiofrequency ablation therapy for pancreatic cysts,

and the studies that have been conducted in other countries have been very small, leaving the need for larger studies in this field.

Dr Brugge serves as a consultant for Boston Scientific and US Endoscopy.

Suggested Reading

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