Dual-modality drainage of infected and symptomatic walled-off pancreatic necrosis: long-term clinical outcomes

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Background: Management options for symptomatic and infected walled-off pancreatic necrosis (WOPN) have evolved over the past decade from open surgical necrosectomy to more minimally invasive approaches. We reported the use of a combined percutaneous and endoscopic approach (dual modality drainage [DMD]) for the treatment of symptomatic and infected WOPN, with good short-term outcomes in a small cohort of patients.

Objective: To describe the long-term outcomes of 117 patients with symptomatic and infected WOPN treated by DMD.

Design: Review of a prospective, internal review board–approved database.

Setting: Single, North American, tertiary-care center.

Patients: All patients with symptomatic and infected WOPN treated by DMD at our institution between 2007 and 2012.

Intervention: DMD of symptomatic and infected WOPN.

Main Outcome Measurements: Disease-related mortality, pancreaticocutaneous fistula formation, need for early and late surgical intervention, procedure-related adverse events.

Results: A total of 117 patients underwent DMD for symptomatic and infected WOPN. A total of 103 have completed treatment, with all percutaneous drains removed. Ten patients are still undergoing treatment, and 4 patients died with percutaneous drains in place (3.4% disease-related mortality). For the patients completing therapy, the median duration of follow-up was 749.5 days. No patients required surgical necrosectomy or surgical treatment of DMD-related adverse events; 3 patients required late surgery for pain (n = 2) and gastric outlet obstruction (n = 1). There were no procedure-related deaths. In patients who have completed treatment, percutaneous drains have been removed in 100%; no patients have developed pancreaticocutaneous fistulas.

Limitations: Single-center design, lack of a comparison group.

Conclusion: DMD for symptomatic and infected WOPN results in favorable clinical outcomes; complete avoidance of pancreaticocutaneous fistulae, surgical necrosectomy, and major procedure-related adverse events, while maintaining single-digit disease-related mortality. (Gastrointest Endosc 2014;79:929-35.)

Abbreviations: DMD, dual-modality drainage; PCF, pancreaticocutaneous fistula; PFC, pancreatic fluid collection; WOPN, walled-off pancreatic necrosis.

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The past decade has witnessed the emergence of several new options for the management of infected or symptomatic walled-off pancreatic necrosis (WOPN). Whereas open surgical necrosectomy has been the historical criterion standard,[1-3] newer, less-invasive techniques have been developed and implemented in clinical practice, with equivalent, and in some cases, superior, clinical outcomes.[4-8] New data from a randomized clinical trial comparing initial surgical necrosectomy to a "step-up" approach of percutaneous drainage followed by, if clinically necessary, video-assisted retroperitoneal debridement, suggested superior clinical outcomes with the latter approach.[9]

Our institution has been performing percutaneous drainage of symptomatic WOPN for >20 years.[10] Although surgical necrosectomy could be avoided in most cases and single-digit mortality achieved, there was an associated 20% rate of chronic pancreaticocutaneous fistula (PCF) formation because of the presence of disconnected pancreatic duct syndrome.[11-12] Building on this experience, we developed a combined endoscopic and percutaneous approach to symptomatic WOPN—dual-modality drainage (DMD)—in which transenteric stents were placed endoscopically into the necrosum immediately after percutaneous drainage.[13] This allowed redirection of pancreatic juice into the GI tract, thus decreasing the risk of PCF formation in patients with disconnected glands. Although the initial experience describing this technique in 15 patients appeared promising, longer-term outcomes in a larger patient cohort have remained an open question.

The aim of this study was to describe the short-term and long-term clinical outcomes in a large cohort of patients who have undergone DMD for symptomatic WOPN at our institution.

Take-home Message

- Dual-modality drainage for symptomatic and infected walled-off pancreatic necrosis results in favorable clinical outcomes, complete avoidance of pancreaticocutaneous fistulae, surgical necrosectomy, and major procedure-related adverse events while maintaining single-digit disease-related mortality.

METHODS

Patients

All patients undergoing primary DMD for symptomatic or infected WOPN at our institution between October 2007 and June 2013 were included in this analysis. An internal review board–approved, prospective database was reviewed. Patients who had undergone "rescue" DMD (those who had percutaneous drains placed outside our institution and subsequently had transenteric drains placed on transfer to our hospital in an attempt to avoid PCF formation) were excluded from this analysis.

Indications for drainage

Indications for DMD of WOPN were as follows: (1) evidence of infected necrosis. The diagnosis of infected necrosis was based on initial clinical suspicion, supported by relevant imaging findings and confirmed at the time of percutaneous drainage by Gram stain and culture of an aspirate of the necrosum; (2) clinical deterioration and/or patient failure to improve clinically despite maximal medical management; and (3) symptomatic gastric outlet obstruction secondary to extrinsic compression from the necrosum.

The decision to proceed with DMD in any patient was made in a multidisciplinary fashion involving a team of gastroenterologists, hospitalists, interventional radiologists, intensive-care specialists, and, where needed, pancreaticobiliary surgeons.

DMD

This technique has been previously described in detail.[13] Briefly, patients were initially brought to the interventional radiology suite, where the necrosum was accessed under US and/or CT guidance. The insertion site for percutaneous drainage of pancreatic fluid collections (PFCs) was primarily dependent on the location of the collection. However, there were many additional factors that were considered in choosing the insertion site. The trajectory of the catheter needed to avoid the vasculature, the bowel space, and the pleural space. The path of the catheter needed to be relatively straight to avoid kinks with patient motion. The entry of the catheter into the collection was directed toward the dependent portion of the collection so that gravity could assist in drainage. Finally, accessibility of the insertion site for wound care and flushing was considered. Once accessed, a sample of the necrosum was obtained and sent for Gram stain and culture. The tract was then dilated, and an initial smaller-caliber drain was placed.

The patient was then taken immediately to the endoscopy suite, and general anesthesia was administered. The necrosum was accessed either endoscopically (if a visible bulge was present intraluminally) with a needle-knife sphincterotome (Cook Endoscopy, Winston-Salem, NC) or under EUS control by using a 19-gauge needle or EUS-directed transenteric drainage system (Navix; Xlumena, Mountain View, CA). After wire-guide access was achieved, the tract was dilated by using either a bougie 4F to 6F dilating catheter (Cook), needle-knife sphincterotome (Cook), or Navix device, subsequent to which further dilation was performed by using a 6 to 8–mm CRE balloon dilator (Boston Scientific, Natick, Mass) (or 8-mm balloon on the Navix catheter). Two 7F (varying lengths) double pigtail stents (Cook) were placed across the gastric or duodenal wall to maintain the tract. In the case of multiple areas of WOPN, multiple percutaneous drainage catheters