Pancreaticocolonic Fistulas Secondary to Severe Acute Pancreatitis Treated by Percutaneous Drainage: Successful Nonsurgical Outcomes in a Single-center Case Series

Zachary R. Heeter, MD, Ellen Hauptmann, MD, Robert Crane, MD, MD, Mehran Fotoohi, MD, David Robinson, MD, Justin Siegal, MD, Richard A. Kozarek, MD, and Michael Gluck, MD

ABSTRACT

Purpose: Pancreaticocolonic fistulas (PCFs) are uncommon complications of acute necrotizing pancreatitis (ANP). Studies advocating primary surgical treatment showed severe morbidity and mortality with nonsurgical treatment, with survival rates of approximately 50%. However, a nonsurgical treatment scheme with primary percutaneous drainage and other interventions may show improved outcomes. This retrospective single-center study describes the presentation, diagnosis, course, treatment strategy, and outcome of successfully treated PCFs, with an emphasis on nonsurgical interventions.

Materials and Methods: Twenty patients with PCFs caused by ANP were treated with percutaneous drainage and medical therapy. Additional interventions included endoscopic transenteric drainage and pancreatic duct (PD) stent placement. Surgery was reserved for patients in whom this nonsurgical management failed.

Results: All PCFs closed during a median follow-up of 56 days (mean, 106 d; range, 13–827 d). Treatment included percutaneous drainage of the PCF-related collection in all patients, PD stents in 60%, transenteric drainage in 15%, and definitive surgery in 15%. Indications for surgery included severe PCF-related symptoms, large feculent peritoneal collection, and colonic stricture. Two patients (10%) died, one of complications of ANP and one of esophageal carcinoma. Additional enteric fistulas were identified in 50% of patients. Median time from the most recent diagnosis of pancreatitis to PCF diagnosis was 89 days (mean, 113 d; range, 13–394 d).

Conclusions: A nonsurgical approach to PCFs caused by ANP, including percutaneous drainage and other techniques, yields good survival, with surgery reserved for cases in which this approach fails.

ABBREVIATIONS

ANC = acute necrotic collection, ANP = acute necrotizing pancreatitis, AP = acute pancreatitis, DMD = dual-modality drainage, ERCP = endoscopic retrograde cholangiopancreatography, PCF = pancreaticocolonic fistula, PD = pancreatic duct, WOPN = walled-off pancreatic necrosis

Pancreaticocolonic fistulas (PCFs) are uncommon complications of acute necrotizing pancreatitis (ANP) (1–4). Primary surgical treatment of PCFs has been advocated based on several small case series documenting disastrous outcomes for PCFs managed nonsurgically, ie, without open or laparoscopic surgery (5–7). Described complications include massive hemorrhage and infection, and a nonsurgical survival rate of less than 50% is reported (8).

Nonsurgical techniques for PCF treatment have been described, such as percutaneous drainage (9), endoscopic transenteric drainage (or dual-modality drainage [DMD]) (10), pancreatic duct (PD) stent placement, and fibrin glue fistula closure (11). Drainage of peripancreatic fluid collections is a longstanding treatment option, and, in PCF, is thought to serve two purposes (12–14). Infected fluid and

From the Department of Radiology (Z.R.H., E.H., R.C., M.F., D.R., J.S.), and the Digestive Disease Institute (R.A.K., M.G.), Virginia Mason Medical Center, 1100 Ninth Ave., Seattle, WA 98101. Received April 30, 2012; final revision received and accepted September 19, 2012. Address correspondence to Z.R.H.; E-mail: heeter@gmail.com

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enzymatically active pancreatic juice cause injury to the tissues of the fistula, and diverting this material reduces inflammation and local ischemia. Additionally, creating an alternate drainage pathway reduces the flux of material through the fistula and allows it to close. The present retrospective study examines patients with PCF as a complication of acute pancreatitis (AP). The study describes the presentation, diagnosis, and course of a single-center PCF patient population as well as the treatment strategy and outcomes, with an emphasis on nonsurgical techniques.

MATERIALS AND METHODS

This study was given a waiver by our institutional review board because it is a retrospective study. For this study's purposes, a proposed revision of the previously accepted Atlanta classification of AP was used for clinical staging and terminology guidance (15–17). ANP appears to follow an initial phase during which local pancreatic inflammation progresses from ischemia and edema to subsequent necrosis and liquefaction. This process may result in parenchymal or peripancreatic collections containing various amounts of necrotic material and fluid, which are called acute necrotic collections (ANCs) if within 4 weeks of the onset of AP presentation or walled-off pancreatic necrosis (WOPN) if after 4 weeks and formation of a nonepithelialized wall. ANCs and WOPN may be infected or sterile, and, in our experience, PCFs are generally associated with infected WOPN, a mature collection amenable to percutaneous drainage. The terms "pancreatic abscess" and "infected necrosis" are now referred to as infected WOPN under the new classification scheme.

AP was clinically defined by at least the first two of the following three features: (i) abdominal pain suggestive of pancreatitis (epigastric pain often radiating to the back), with the start of such pain considered to be the onset of AP; (ii) serum amylase and lipase levels at least three times the normal levels; and (iii) characteristic findings on computed tomography (CT), magnetic resonance imaging, or transabdominal ultrasonographic (US) studies. In the revised classification system, severe pancreatitis is clinically defined only in an initial phase lasting approximately 1 week, whereas the commonly used term "severe AP" roughly corresponds to ANP.

Inclusion criteria were age at least 18 years and presence of AP and PCF. Patients were excluded if the etiology of AP or PCF was neoplasm (primary or metastatic to the pancreas) or if PCF was not ultimately caused by AP. Postsurgical PCFs, defined as fistulas occurring after surgical violation of the pancreas or planes around the pancreas, were included only if the surgery was a treatment for pancreatitis or its complications, ie, pancreatitis was a preceding diagnosis, excluding those with neoplasm as stated earlier.

Interrogation of billing databases between January 2000 to March 2011 revealed 3,192 patients admitted or seen in clinic with a primary diagnosis of AP on the basis of symptoms and increased serum amylase or lipase levels. Of those, there were 39 patients with pancreatic cancer diagnoses. After these patients were excluded, 3,153 patients with AP remained. Review of imaging data showed that 371 of the 3,153 received percutaneous drains in the management of symptomatic pancreatic fluid collections. There were no patients with PCFs treated without percutaneous drainage.

Of the 371 patients with AP with percutaneous drains, 25 patients with PCFs were identified. Of those, one was excluded for PCF secondary to local renal cell cancer extension, one was excluded for PCF secondary to PD injury during gastric cancer surgery, one was excluded for PCF secondary to complication from remote splenic artery aneurysm repair, and one was excluded for an iatrogenically caused PCF during percutaneous drain placement. One patient was lost to follow-up while their PCF was ongoing. Only patients with resolved PCFs were included. After these exclusions, 20 patients with resolved PCFs secondary to AP were identified (**Fig 1**). One patient in this series has been included in a previous study (18).

Charts and radiographic imaging were reviewed to determine patient demographics and the location, presentation, course, and management of PCFs associated with ANP. Follow-up duration was variable, with a mean of 649 days (range, 80–2,997 d).

Mean patient age was 60.1 years, with a range of 23–81 years. Male patients constituted 55% of the cohort. The etiology of AP in the 20 patients with PCFs was choledocholithiasis (50%), idiopathic (20%), alcohol-induced (15%), hypertriglyceridemic (10%), and post–endoscopic retrograde cholangiopancreatography (ERCP; 5%; **Table**). Symptoms of PCF were nonspecific and included diarrhea, abdominal pain, and fever. One patient experienced hematochezia and one experienced feculent emesis. Three patients (15%) presented with PCF after earlier surgeries to treat WOPN and its complications. Surgeries included a necrosectomy, a necrosectomy with left transverse colectomy, and an open cystgastrostomy.

For this study, no attempt was made to classify the fluid collections as ANCs or WOPN. Many patients had multiple episodes of AP treated at outside institutions, and their courses of disease and fluid collection history were often unavailable. The date of the most recent diagnosis of AP was used to measure the time from pancreatitis presentation to PCF diagnosis. Determination of PCF location—left or right colon, as divided at the midtransverse level—was made by fluoroscopic tube-check images. More precise localization was not attempted because most fistulous tracts were seen only on percutaneous drain studies, which are imprecise and prone to subjective evaluation.

PCF duration was determined by the time elapsed between the initial imaging diagnosis, generally by fluoroscopic drain check, and subsequent resolution. PCFs were considered resolved when they were no longer identifiable on imaging or endoscopy. At least two patients appeared to have a resolved PCF on fluoroscopic tube-check imaging