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CASE REPORT | ENDOSCOPY

Transcolonic Necrosectomy: A Rarely-Used Pancreatic Debridement Strategy

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ABSTRACT

Necrotizing pancreatitis represents a life-threatening sequela of acute pancreatitis in which rapid necrotization of pancreatic and abdominal tissue leads to inflammation and sometimes infection. Treatment includes debridement of necrotic tissue to prevent inflammation from spreading and antibiotics if infected. Areas of necrosis are accessed through percutaneous drainage, surgical debridement, or upper endoscopy. In this study, we present a case of walled-off necrosis debrided through a fistulous connection to the transverse colon. Transcolonic necrosectomy is a seldom used approach, which could provide treatment options for necrotizing pancreatitis in anatomically amenable patients.

KEYWORDS: necrotizing pancreatitis; therapeutic endoscopy; endoscopy; post-ERCP pancreatitis; fistula; therapeutic endoscopy; interventional endoscopy; fistula

INTRODUCTION

Acute pancreatitis (AP) is an inflammatory condition of the pancreas with an annual incidence of 34 in 100,000 individuals.[1] For 85% of patients, AP presents as interstitial pancreatitis, characterized by low mortality and an average hospital length of stay of 4 days. In 15% of patients, AP can progress to necrotizing pancreatitis (NP). These necrotizing fluid and tissue collections may develop into walled-off necrosis, gastrointestinal tract fistulas, become infected, and nutritional failures related to mass effect. NP greatly increases patient mortality. As many as 80% deaths in AP resulted from sepsis related to NP.[2] Management of NP depends on severity of illness, presence of infection, nutritional status, fistulizing disease, and symptomatology. Surgical necrosectomy is reserved for severe cases not amenable to less-invasive strategies,[3,4] such as endoscopic or percutaneous drainage. In this study, we present a patient with NP and walled-off necrosis complicated by a colonic fistula that was treated with transcolonic necrosectomy (Figures 1–3).

CASE REPORT

A 33-year-old man without significant medical history and with normal liver function (total bilirubin 0.5, alanine transaminase 22, aspartate aminotransferase 22) presented for elective cholecystectomy for cholelithiasis with possible cholecystitis. This surgery was complicated by operative bile leak requiring intraoperative placement of a Jackson-Pratt drain. He presented to the emergency department the following day with abdominal pain. Owing to concerns of bile leak, he was transferred to a second facility for endoscopic retrograde cholangiopancreatography (ERCP) with cholangiogram. A 7 mm stone was swept from the lower third of the main bile duct underwent sphincterotomy and plastic stent placement (10 Fr by 7 cm). He tolerated the procedure well, received a 100 mg indomethacin suppository, tolerated oral intake postoperatively, and was discharged the following day with 5 days of amoxicillin-clavulanate 875-125 mg dosed twice daily. He returned to the emergency department one day later with epigastric abdominal pain radiating to his back. Laboratory results revealed leukocytosis of 21.4 and a lipase >5,000 U/L. Computed tomography (CT) of the abdomen showed uncomplicated acute edematous pancreatitis. He was admitted to the second hospital for 8 days for AP with sepsis.

On postoperative (post-op) day 8, he was transferred to our facility for management of high-output biliary leak confirmed with hepatobiliary iminodiacetic acid scan. He had been having severe abdominal pain, daily spiking fevers, and peripancreatic fluid

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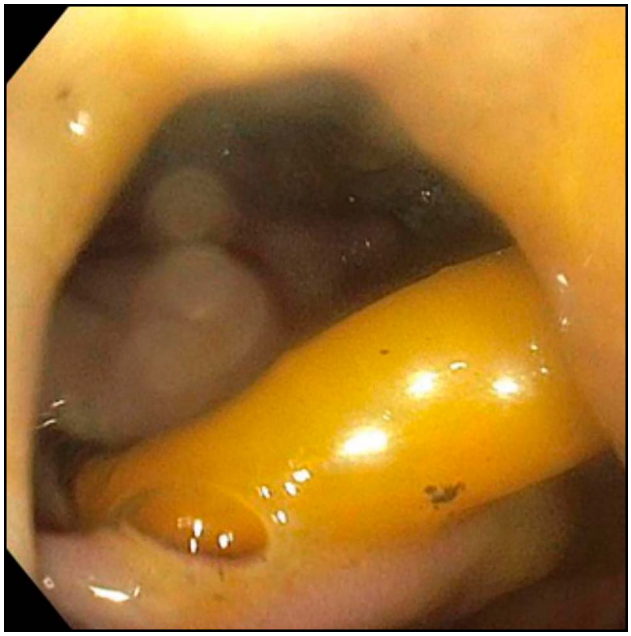

Figure 1. Fistula identified on index colonoscopy.

collections. ERCP was technically difficult due to severely congested duodenal mucosa without active bleeding. It revealed an occluded biliary stent, borderline-dilated common bile duct, and biliary leak at the level of the cystic duct. A fully covered metal stent (8 mm × 6 cm) replaced the occluded stent 5 cm. He received an indomethacin suppository and a 1 L intravenous fluid bolus. Cholangiogram was repeated 13 days later, revealing a moderately dilated common bile duct and persistent leak just proximal to the end of the metal stent. Biliary debris was also identified, swept, and removed. A second fully covered metal

Figure 2. Walled-off necrosis cavity following initial debridement.

Figure 3. Snare necrosectomy.

stent (10 mm × 6 cm) was placed just proximal to the previous stent. Repeat cholangiogram showed resolution of the leak.

On postoperative day 9, he underwent CT drainage of a midline fluid collection with a 12F pigtail placed by interventional radiology for a necrotizing pancreatic fluid collection. Five days later, a CT angiogram showed active hemorrhage into a large pseudocyst in the transverse colon possibly related to pigtail placement. Interventional radiology embolized the inferior mesenteric artery. He was admitted to the intensive care unit on postoperative day 21 for management of hemorrhagic shock with sepsis and severe pancreatitis. On postoperative day 28, the pigtail was upsized to 20F in the midline fluid collection (10 mm × 9 cm) with 14F catheters placed in lower right quadrant and lower left quadrant for loculated ascites. Later, drains were placed in the left upper quadrant and right upper quadrant for a total of 5 drains (1 in each quadrant and 1 midline). After clinical recovery and improved oral intake, these were left in place for an additional 4 months while the patient was in rehabilitation facility (Figures 4–6).

On postoperative day 59, he had CT with oral contrast, which revealed mid abdominal fluid collection with IR-placed drain communicating with the transverse colon. Colonoscopy 1 week following this CT scan demonstrated a 3 cm fistula in the transverse colon connecting to a multiloculated necrotic cavity. The scope was able to pass into the cavity, and multiple sizes of snare and a rat-toothed forceps were used to debride the cavity. He had repeat follow-up colonoscopy with necrosectomy the following week to assist with early satiety and inadequate oral intake. This included debridement with multiple endoscopic instruments, vigorous irrigation and aspiration of contents, and identification of the percutaneously placed drain passing through a second fistula. At that time, there was scant residual necrotic tissue. In the following week, he was transitioned from a clear liquid diet to a general diet, and on postoperative day 84, he was discharged to a rehabilitation facility (Figures 7–9).

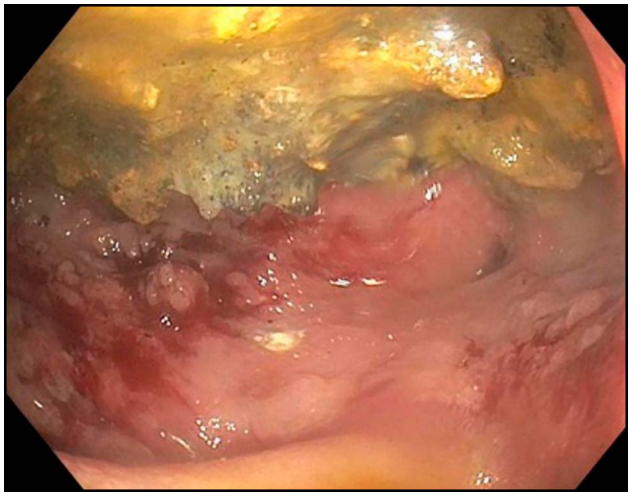

Figure 4. Cavity following sequential debridement.

In the following months, he was followed closely outpatient with interventional radiology and infectious disease for management of his abdominal fluid collections. Six months after his surgery, he was off antibiotics and free of all drains. A repeat colonoscopy 177 days after the initial one showed three 8–11 mm fistulae communicating with a small 2–3 cm cavity neighboring the transverse colon. Cholangiogram showed resolution of his bile leak, his stents were removed, and the biliary tree swept with sludge found. Nearly 10 months postoperative surgery, an abdominal CT showed no significant residual fluid collection or bowel abnormalities. He is regaining lost weight and again living in the community with his young family (Figures 10 and 11).

DISCUSSION

The majority of deaths associated with AP can be attributed to necrotic infection.[2] Management of NP is routinely performed with percutaneous drainage, followed by surgical or endoscopic necrosectomy to minimize postprocedural complications.[3,4] The American College of Gastroenterology guidelines recommend concurrent indomethacin suppository be given when undergoing ERCP and stent placement given the high possibility of post-ERCP pancreatitis.[5] They also discourage antibiotics for use in severe AP without other indications.[5]

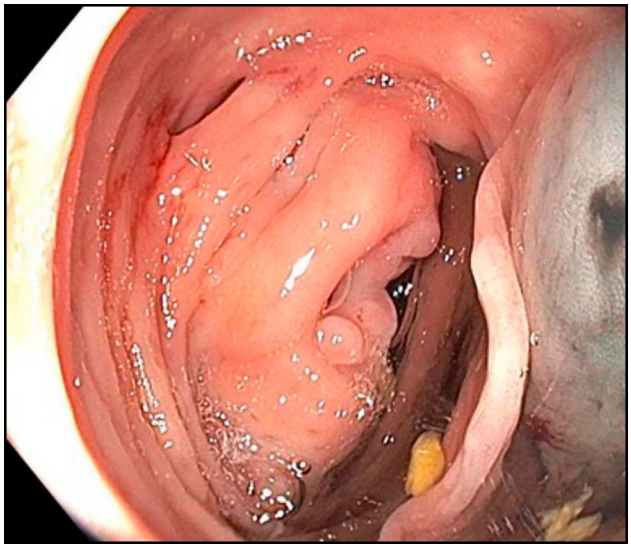

Figure 5. A healthy appearing fistula noted on follow-up exam. No attempt was made to close the fistuous tracts using an OTSC clip given the healthy appearance, size and number.

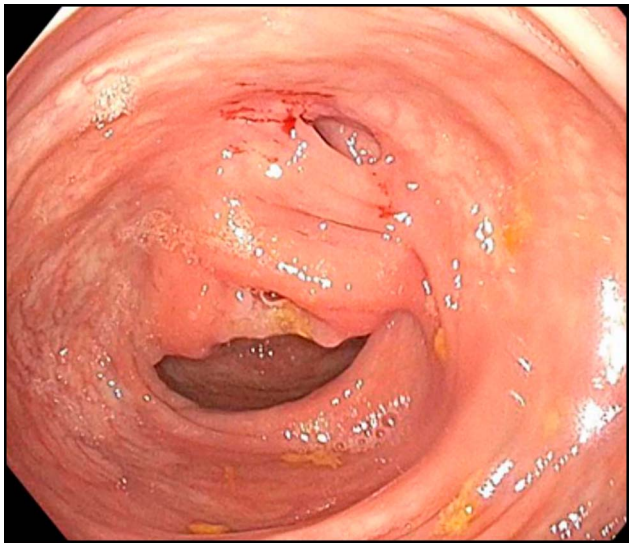

Figure 6. The second of 3 fistulous lesions noted on follow-up endoscopy. These were not closed further owing to their healthy appearance.

Figure 7. Coronal computed tomography of the abdomen showing peripancreatic abscess with fistula before both necrosectomies.

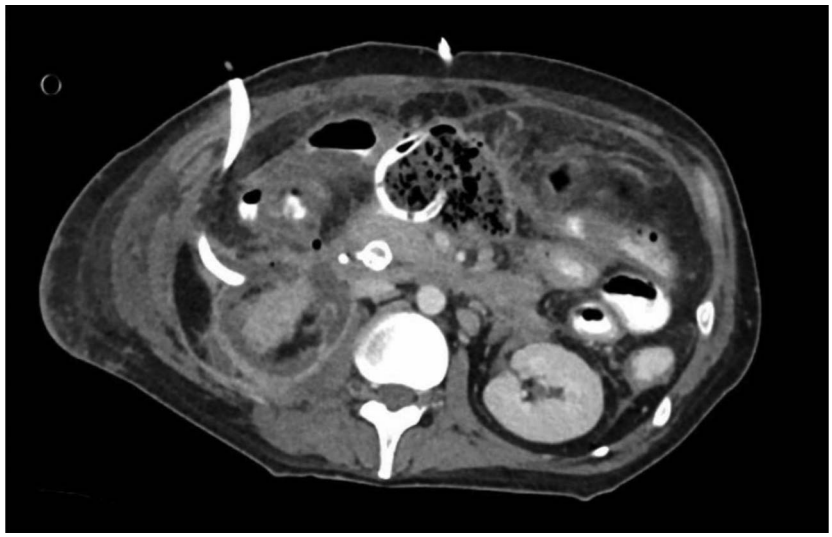

Figure 8. Sagittal computed tomography at the same time as Figure 7.

The presence of a lower gastrointestinal fistula generally limits interventions to percutaneous drainage or surgical debridement.[6] The American Gastroenterology Association recommends surgical necrosectomy should not occur before 4 weeks or when the necrosis is well organized.[5] Our patient's colonic fistula was identified by colonoscopy and sufficiently large for endoscopic intubation without further dilation, the creation of a new fistula, or other bowel injury. This allowed for colonoscopic necrosectomy, a rare approach.

Pancreatic fluid collections are frequent complications of pancreatitis. In the setting of persistent organ dysfunction due to sterile necrosis or infected necrosis, surgical necrosectomy can be performed. This is generally avoided unless conservative measures fail and delayed until after the necrosis is well organized. Other best practice indications include abdominal pain, fistulas, nutritional failure, persistent nausea or vomiting, and obstruction.[5,7] On the contrary, other studies are available showing that delaying or avoiding surgical necrosectomy can improve mortality in these cases. One study found that mortality following surgical necrosectomy was significantly decreased from 39% to 12% ($P = 0.003$) when it was delayed as long as possible, closer to 30 days rather than within the first 72 hours.[8] This was supported by a different study of 88 patients with severe pancreatitis (APACHE II score, $>$ or $=$ 11; Ranson score $>$ or $=$ 4) who received intensive care unit-level treatment primarily with antibiotic regimens adapted to bacteriology. In this study, no patient received urgent surgery and 18% were managed medically solely.[9]

Owing to these recommendations, guidelines, and studies, it is easy to see how surgical and medical teams might differ in their management of complications of AP. There were indications

Figure 9. Coronal computed tomography of the abdomen showing healing 1 week after the last necrosectomy.

Figure 10. Sagittal computed tomography at the same time as Figure 9.

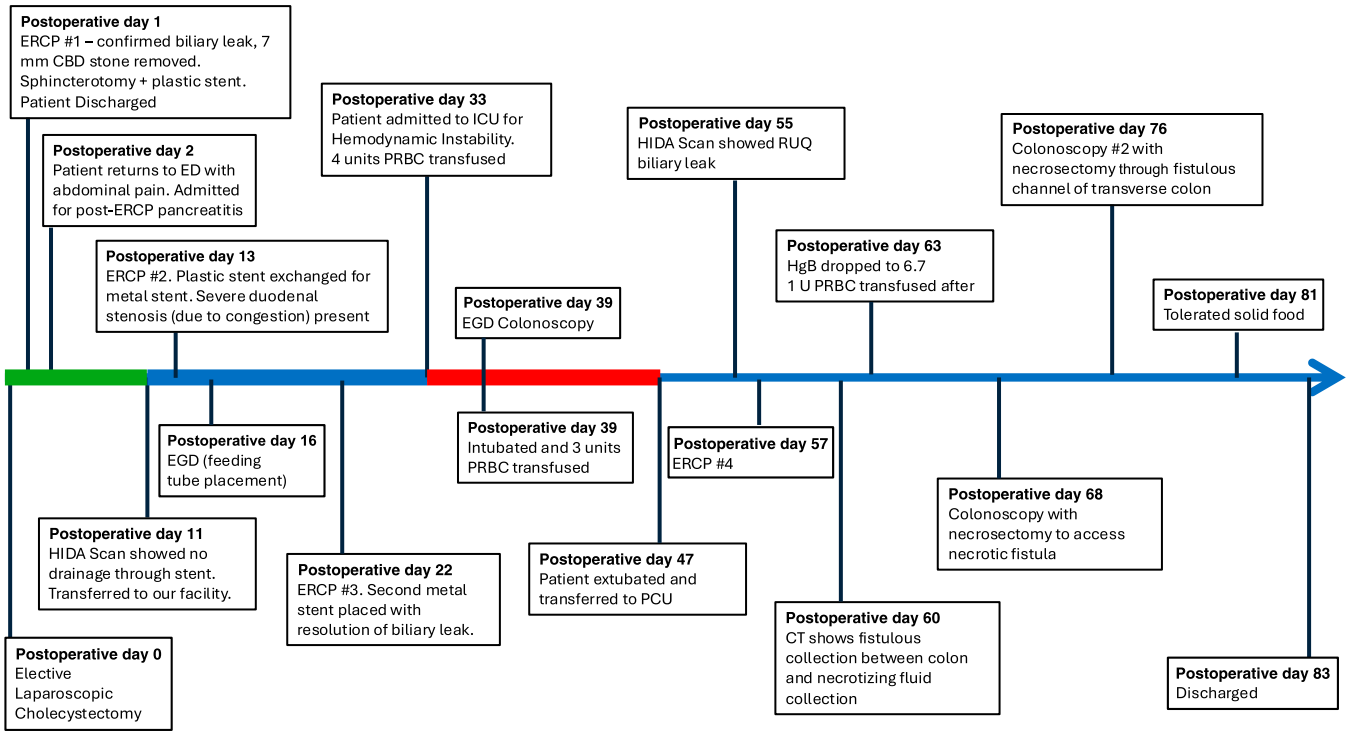

Figure 11. A timeline of the patient's hospital admission(s) and key events. CBD, common bile duct; CT, computed tomography; ED, emergency department; EGD, esophagogastroduodenoscopy; ERCP, endoscopic retrograde cholangiopancreatography; HIDA, hepatobiliary iminodiacetic acid scan; ICU, intensive care unit; PCU, progressive care unit; PRBC, packed red blood cell; RUQ, right upper quadrant.

for surgical necrosectomy. This may have abbreviated the hospital course and resulted in fewer complications, procedures, antibiotics, and imaging.

This case and procedure demonstrates a unique colonoscopic approach for treatment of NP and its complications. It highlights the challenges in determining the timing and benefit of surgical necrosectomy vs endoscopic. Each case has opportunities for improvement in management. In retrospect, we feel the medical treatment was consistent with guideline directions. We wonder if surgical necrosectomy would have reduced the morbidity and length of this hospital course. We present this to allow heightened visibility to our unique treatment approach with a pathologic fistulous approach and hope it promotes further research.

DISCLOSURES

Author contributions: Literature search and background: R. Madhu, Direct patient care: all authors, Drafted manuscript: TR Checketts, R. Madhu, S. Sidhu, Edited and revised manuscript: S. Sidhu, TR Checketts, Approved final version of manuscript: TR Checketts, A. Al-Chalabi. A. Al-Chalabi is the article guarantor.

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