

Endoscopic Management of Giant Walled-Off Pancreatic Necrosis With a High Risk of Bleeding

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ABSTRACT

Walled-off pancreatic necrosis (WOPN) is one of the late complications of acute pancreatitis. We present a 37-year-old man who developed a large WOPN 6 weeks after treatment of severe complicated pancreatitis. Imaging studies revealed a necrotic retroperitoneal fluid collection measuring 27 × 12 × 27 cm with large crossing blood vessels. Cystogastrostomy was performed using a lumen-apposing metal stent. He underwent multiple necrosectomies with significant improvement in the cyst size. Bleeding is a major complication of direct endoscopic necrosectomy; hence, specific imaging and a careful approach should be taken into consideration, especially in WOPN with a high risk of bleeding.

INTRODUCTION

Walled-off pancreatic necrosis (WOPN) is one of the late complications of acute pancreatitis with an incidence rate of 1%–9%.^{1,2} Because of inflammation, apoptosis, and necrotic injury to the pancreas and the surrounding tissue, WOPN develops 4 or more weeks after acute pancreatitis.² Structurally, WOPN consists of a collection of solid necrotic debris and fluids that is surrounded by an epithelium-lacking fibrous capsule. Infection, visceral obstruction or perforation, and hemorrhage are the main complications of WOPN. Patients with symptomatic WOPN who do not respond to conservative therapy should undergo drainage. Historically, surgical intervention was considered the gold standard treatment; however, endoscopic management has been implemented and has gained more recognition as the preferred method of therapy.^{2,3} Furthermore, endoscopic ultrasound (EUS)-guided drainage is currently the most preferred method because of a higher technical success rate compared with conventional endoscopic drainage.⁴ Bleeding is the most common complication (18%) after endoscopic drainage.⁵

CASE REPORT

A 37-year-old man with a medical history of alcohol abuse presented with abdominal pain radiating to the back. He was found to have alcohol-induced severe necrotizing pancreatitis. His hospital course was complicated by acute kidney injury requiring dialysis and acute hypoxic respiratory failure requiring mechanical ventilation. During that admission, magnetic resonance imaging of the abdomen with and without contrast and magnetic resonance cholangiopancreatography revealed patchy areas of decreased attenuation in the body and head of the pancreas consistent with areas of necrosis. It also revealed a large heterogeneous peripancreatic collection containing areas of fluid and necrotic debris with enhancing wall. The fluid collections were not amenable to intervention at that time, and the patient improved clinically. The patient fully recovered and was discharged to a skilled nursing facility after 37 days of hospitalization.

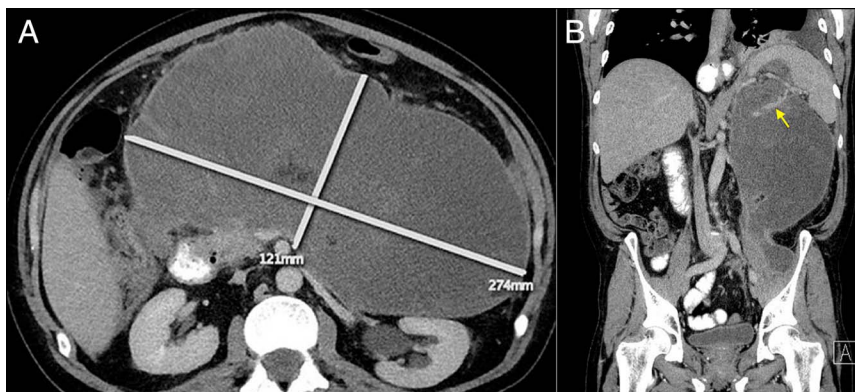


Figure 1. Computed tomography showing (A) the large walled-off pancreatic necrosis with dimensions and (B) the splenic artery crossing through the cyst.

Six weeks after discharge, he presented to a follow-up visit complaining of a 1-week history of severe intermittent abdominal pain associated with decreased appetite. On physical examination, his vital signs were within normal limits and the abdomen was moderately distended without tenderness. Laboratory tests showed a hemoglobin level of 12.4 g/dL, which was higher than the level at time of discharge (8.6 g/dL). A computed tomography (CT) scan of the abdomen and pelvis with contrast revealed a necrotic retroperitoneal fluid collection measuring $27 \times 12 \times 27$ cm with large crossing blood vessels (Figure 1). We considered the possibility of a pseudoaneurysm in the large crossing blood vessels; however, the patient did not have any signs or symptoms of bleeding, and an EUS-guided cystogastrostomy was scheduled to ensure the lack of blood vessels at the wall of the cyst.

The patient underwent EUS examination with doppler, which confirmed the presence of large crossing blood vessels. A cystogastrostomy was performed using a 10×15 mm lumen-apposing metal stent (AXIOS; Boston Scientific, Marlborough, MA). Over 2 L of brown fluid was aspirated. Large crossing blood vessels partially coated with necrotic material were noted in the fluid collection (Figure 2). During subsequent

necrosectomies, a rat-tooth forceps (Boston Scientific) and a 15-mm snare (AcuSnare Duck Bill; Cook Medical LLC, Bloomington, IN) were used to remove necrotic tissue. The WOPN was irrigated with sterile water after each necrosectomy session. Interventional radiology backup was available during these procedures in case of bleeding.

The patient developed a fever and leukocytosis before the fourth necrosectomy session, and his hemoglobin was 10.1 g/dL. He also had a small amount of bright red blood per rectum, which raised the concern for a bleeding pseudoaneurysm or rupture of large blood vessels. A CT angiogram scan showed multiple foci of air in addition to surrounding inflammatory changes suggestive of interval infection of the cyst without pseudoaneurysm or active bleeding. A multidisciplinary team consisted of gastroenterology, general surgery, critical care, and interventional radiology decided to proceed with the placement of a drain by interventional radiology, and necrosectomies were continued. Although the patient did not have any bacterial growth in blood cultures, he received intravenous antimicrobials of piperacillin/tazobactam for 7 days, followed by oral ciprofloxacin and metronidazole for 7 more days on discharge. He subsequently underwent 9 necrosectomies over a 10-week period without complications.

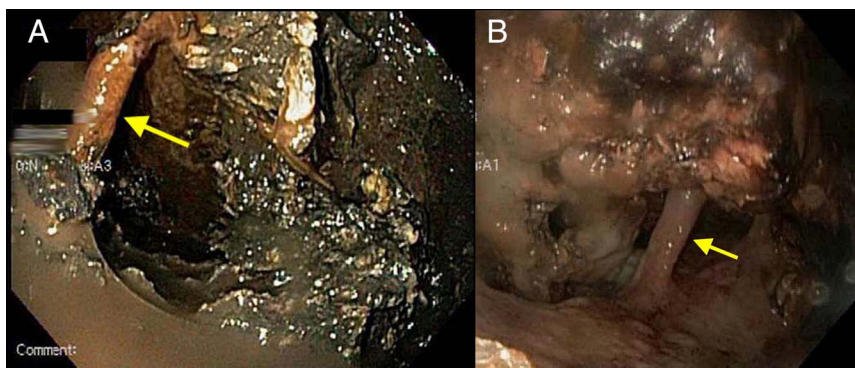


Figure 2. Endoscopy of the cyst showing the large crossing blood vessel (A) surrounded by necrotic tissue and (B) following necrosectomy.

The patient traveled to a different state and lost follow-up for further sessions. After 2 months, he developed rectal bleeding and syncope, so he underwent emergent exploratory laparotomy with splenectomy and right hemicolectomy at an outside facility. He returned to our hospital for follow-up at the gastroenterology clinic, and further imaging studies showed resolution of the WOPN.

DISCUSSION

Management of WOPN has always been a challenge with multiple modalities in play. It underwent fundamental changes in recent years. Multiple studies have shown that surgical drain, either open or minimally invasive necrosectomy, has been associated with higher rates of morbidity and mortality in addition to higher risk for major complications.^{6,7} Interventional methods such as endoscopic and percutaneous drainage have extensively replaced surgical drainage as the primary, effective, and less invasive approach for symptomatic WOPN. In fact, the European Society of Gastrointestinal Endoscopy recommended EUS-guided drainage through cystogastrostomy or cystoduodenostomy as the preferred method of treatment for patients with WOPN.⁴ The largest pancreatic pseudocyst drained by EUS-guided cystogastrostomy was reported by Udeshika et al with dimensions of 30 × 15 × 14 cm.⁸ In our case, the patient had a larger cyst with dimensions of 27 × 12 × 27 cm, and he was managed initially with EUS-guided cystogastrostomy, followed by necrosectomy, percutaneous drainage, and surgical drainage.

In patients who do not improve with endoscopic drainage, direct endoscopic necrosectomy (DEN) is recommended to achieve complete resolution. DEN consists of the debridement of the walled-off necrosis using different auxiliary instruments. Although there is no special tool for necrosectomy, instruments such as snares and baskets can be used.⁹ The lack of special tools for necrosectomy adds another challenge to the procedure and the endoscopist. In this case, the endoscopist used a rat-tooth forceps and a snare to remove necrotic debris, followed by sterile water irrigation during necrosectomy sessions. Developing new instruments for necrosectomy in the future may help reduce the duration of the procedure and the number of sessions to achieve complete resolution of the WOPN.

The most common complication of DEN is gastrointestinal bleeding, which occurs because of the development of pseudoaneurysm or direct injury.⁵ The bleeding rate in EUS-guided cystogastrostomy ranges between 0% and 20% based on randomized trials and observational studies.¹⁰ Contrast-enhanced CT imaging studies and EUS are essential to localize the blood vessels surrounding and/or intervening the cyst.^{11–13} The utilization of EUS helps endoscopists to avoid damaging the blood vessels during the drainage and allows direct visualization of blood vessels crossing over the cyst. Once large crossing vessels

are identified, careful necrosectomy with interventional radiology backup should be considered to ensure safety of the procedure.¹⁴

To our knowledge, this is the largest WOPN that has ever been reported in the literature along with the proximity of a major crossing blood vessel. Our case highlights the importance of CT and EUS in evaluating large blood vessels before drainage and necrosectomy.

DISCLOSURES

Author contributions: F. Alhasan wrote the manuscript. GJ Hoilat and W. Malas reviewed the literature and wrote the manuscript. SK Mahmood and J. Zivny reviewed the manuscript. M. Alsayid wrote and reviewed the manuscript and is the article guarantor.

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Informed consent was obtained for this case report.

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