

Adverse events of pancreatic fluid collections

Judith E. Baars, MD, PhD, Arthur J. Kaffes, MBBS, FRACP, Payal Saxena, MBBS, FRACP

In this video ([Video 1](#), available online at www.VideoGIE.org), we present 3 similar cases in patients who presented to our hospital over 3 consecutive weeks.

Patient 1 was a 43-year-old man who presented with abdominal pain, weight loss, and anemia. He was known to have traumatic pancreatitis and alcoholic liver disease. His CT scan showed a large pseudocyst in the tail of the pancreas measuring 60 × 90 mm ([Fig. 1](#)). EUS-guided FNA demonstrated blood in the pseudocyst.

The collection did not resolve spontaneously after 2 months of observation, and the patient experienced symptoms of gastric outlet obstruction. A CT angiogram

was performed to exclude active bleeding or aneurysm before EUS-guided drainage. Thereafter, EUS-guided drainage was performed by use of a 10 × 15 mm lumen-apposing metal stent (LAMS) with electrocautery-enhanced delivery system (Axios, Boston Scientific, Natick, Mass).

Initially, the patient was doing well and was discharged home the following day. Four days later, the patient presented to the emergency department with hematemesis and hemodynamic instability, requiring massive blood transfusion. The patient immediately underwent an angiogram, which showed a tiny aneurysmal appearance of the distal splenic artery, but no signs of active bleeding.

Because the patient's condition remained unstable, an emergency endoscopy was performed which showed active bleeding from the pseudocyst ([Figs. 2A-C](#)). In an attempt to stop the bleeding, hemostatic powder (Hemospray, Cook Medical, Winston Salem, NC) was applied. Nonetheless, the patient's condition remained hemodynamically unstable, and the angiogram was repeated.

This time, active bleeding from the distal splenic artery was seen ([Fig. 3A](#)). This was followed by embolization of the splenic artery, pseudoaneurysm, and pseudocyst ([Fig. 3B](#)). The patient remained in stable condition afterward. A follow-up CT scan 2 weeks later showed resolution of the pseudocyst.

In this case, it was decided to place a LAMS given the fact that it was not a simple pseudocyst and the pancreatic fluid collection already had old blood and debris inside. The LAMS was placed with the distal flange in close proximity to the splenic artery. In retrospect, placement of a soft plastic double-pigtail stent within the LAMS could have been considered in an attempt to prevent bleeding in such a high-risk case.

Patient 2 was a 47-year-old man who had been admitted to the surgical ward with acute pancreatitis of initially unknown etiology. His father's twin brother's son was known to have a PRSS1 gene defect. A CT scan showed a large collection arising from the pancreatic body and neck into the lesser sac region ([Fig. 4](#)). This collection had a compressing effect on the stomach, common bile duct, and adjacent soft tissue.



Figure 1. CT scan showing large pseudocyst in tail of pancreas with dilated common bile duct and intrahepatic bile ducts (patient 1).

Written transcript of the video audio is available online at www.VideoGIE.org.

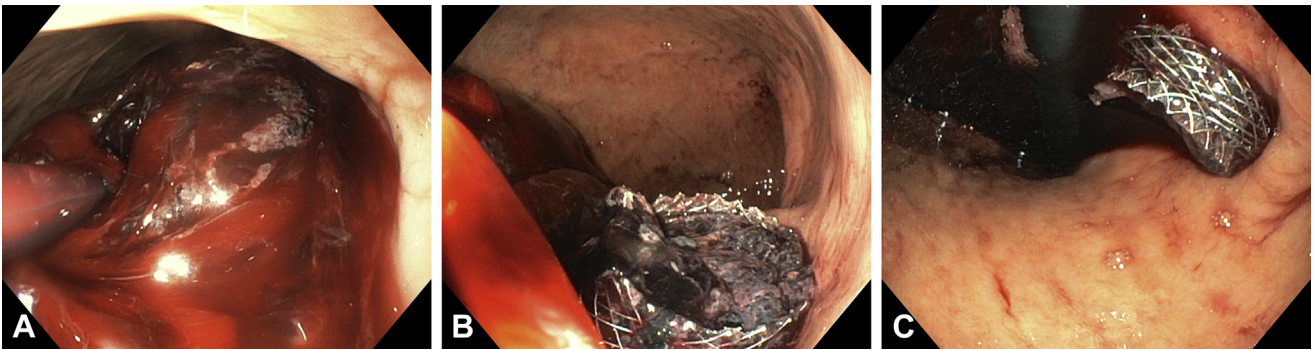


Figure 2. A-C, Gastroscopic images showing active bleeding from the pseudocyst into the stomach (patient 1).



Figure 3. A, Angiogram showing active bleeding from the distal splenic artery into the adjacent pancreatic pseudocyst. **B,** Embolization of splenic artery, pseudoaneurysm, and pseudocyst (patient 1).



Figure 4. CT scan showing a large collection arising from the pancreatic body and neck into the lesser sac region. This had a mass effect on the stomach, common bile duct, and adjacent soft tissues (patient 2).

The patient became hypotensive and tachycardic while in the surgical ward and was in hemodynamically unstable condition despite undergoing fluid resuscitation. He was transferred to the intensive care unit. An angiogram did not show any active bleeding or pseudoaneurysm.

The vessels were severely vasoconstricted because of the use of inotropic agents. EUS was performed in the presence of the interventional radiologist and showed a large pancreatic fluid collection (PCF) with walled-off necrosis (WON). No blood vessels were seen in or around the cyst, and a 10-mm × 15-mm LAMS was placed successfully. Immediately, bright red, fresh blood was seen draining from the stent into the stomach. Immediately after the EUS, the angiogram was repeated. At this stage, extravasation of contrast material from the distal gastroduodenal artery was seen, which was then coiled (Figs. 5A and B).

Three and a half weeks later, the patient became septic, with fever and gastric outlet obstruction. Direct



Figure 5. Angiograms showing extravasation of contrast medium from distal gastroduodenal artery, which was then coiled (patient 2).

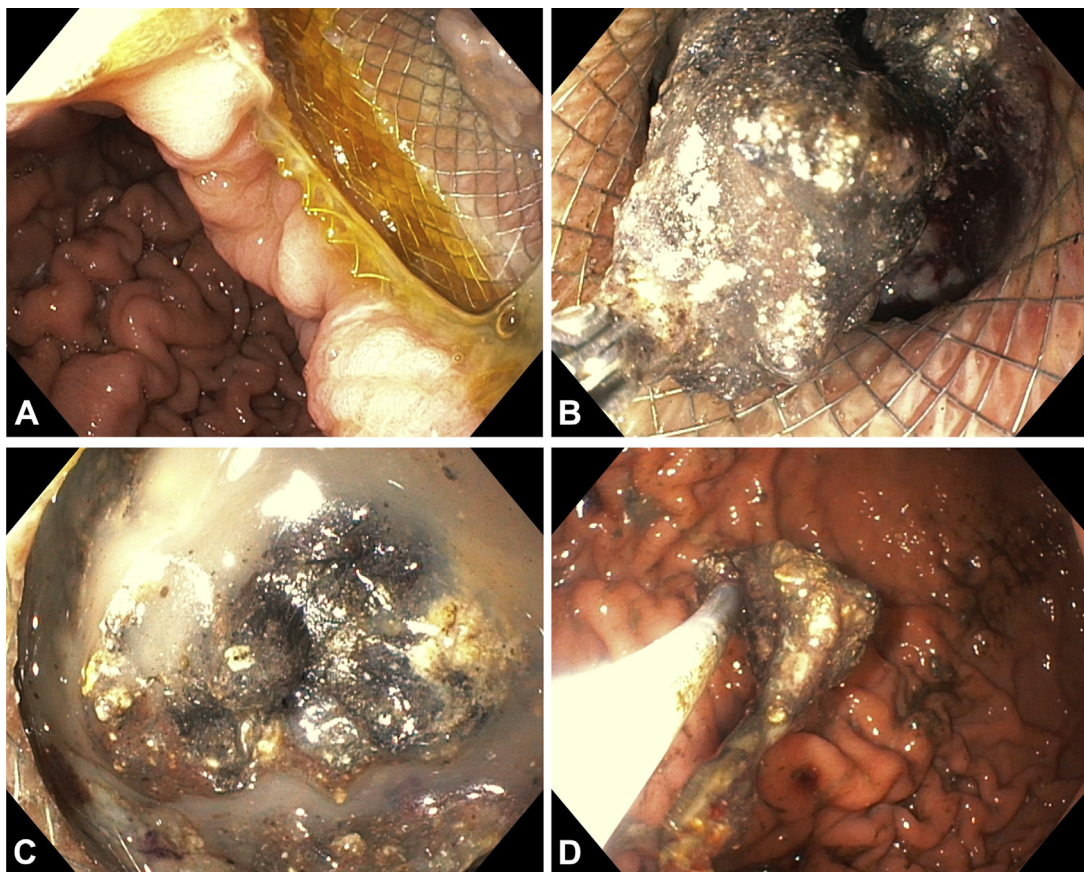


Figure 6. Direct endoscopic necrosectomy in patient 2. **A, B,** Blockage of lumen-apposing metal stent with necrotic material. **C,** Infected pancreatic fluid collection with pus draining out. **D,** Removal of necrotic material by use of a snare and rat-tooth forceps.



Figure 7. CT angiogram showing increase in size of the known pancreatic cyst and no signs of active bleeding (patient 3).

endoscopic necrosectomy (DEN) was performed (Figs. 6A-D). The stent was fully blocked, and the WON was compressing the stomach, causing the gastric outlet obstruction. After the DEN, the compression on the stomach was resolved, and pus was freely draining out of the collection. The patient immediately felt better after the procedure, and the symptoms of gastric outlet obstruction had resolved.

Patient 3 was a 44-year-old man with a PFC 8 weeks after acute pancreatitis with symptoms of gastric outlet obstruction. His medical history included HIV infection, depression, and former intravenous drug use. He had been a binge alcohol drinker in the past, but he had recently undergone detoxification.

He had recently been treated by the surgeons with percutaneous drains and laparoscopic washout. He was scheduled for an elective EUS-guided cyst-gastrostomy. In the interim, the patient required transfer to the intensive care unit because of bleeding and hemodynamic instability.

CT angiogram showed that the known pancreatic pseudocyst arising from the body of the pancreas had increased

in size and contained new diffuse regions of hyperdensity, in keeping with new internal hemorrhage (Fig. 7). No arterial blush or other areas of intra-abdominal bleeding were identified.

An angiogram showed no active hemorrhage. EUS-guided drainage was performed in the acute phase, and a large (>10 cm) hemorrhagic WON with a large amount of solid debris and liquid material was seen. No intervening vessels were seen on the gastric side; however, a moderate-sized vessel was seen along the wall of the distal aspect of the PCF.

A 10-mm × 15-mm LAMS was placed along the gastric body, and a large volume of altered blood and debris freely drained. Initially, the patient recovered well, but 1.5 weeks later he had increased abdominal pain with fever and elevated inflammatory parameters. Endoscopy showed that the LAMS was fully blocked with necrotic material, and DEN was successfully performed, with pus freely draining afterward (Figs. 8A-C). The patient recovered well thereafter. The collection had significantly decreased in size, and the antibiotics were ceased 5 days later.

In summary, we present 3 similar cases of acute deterioration with hemodynamic instability caused by significant bleeding, leading to admission to the intensive care unit and requiring massive blood transfusion. All patients were treated in close collaboration with the interventional radiologist and surgeons.

EUS-guided cyst gastrostomy was performed in the angiography suite in the presence of the interventional radiologist. In this video, we show the technique of endoscopic drainage of WON using LAMSs and necrosectomy when required. Moreover, this video demonstrates that the management of pancreatic fluid collections can be challenging, and one should be aware of the possibility of acute deterioration and the risk of bleeding.

A key management strategy when there is a high index of suspicion for bleeding within the pseudocyst is to perform a CT angiogram to exclude active bleeding and



Figure 8. Direct endoscopic necrosectomy in patient 3. **A, B,** Necrotic material being pulled out of the stent and pancreatic cyst. **C,** Interior of the pancreatic cyst cavity.

aneurysms. Therefore, all patients should be treated in close collaboration among the endoscopist, the interventional radiologist, and the surgeon.

DISCLOSURE

Dr Saxena is a consultant for Boston Scientific, Apollo Endosurgery, and Pentax Medical and a recipient of research grants from Cook Medical and Boston Scientific.

All other authors disclosed no financial relationships relevant to this publication.

Royal Prince Alfred Hospital, Sydney, New South Wales, Australia.

Copyright © 2018 American Society for Gastrointestinal Endoscopy. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.vgie.2017.11.002>

Endoscopedia

Endoscopedia has a new look! Check out the redesign of the official blog of *GIE* and *VideoGIE*. Keep up with the latest news and article discussions and post your comments or questions to *VideoGIE* authors. Visit us at www.endoscopedia.com.