ORIGINAL ARTICLE

EUS-guided pseudoaneurysm embolization CME

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INTRODUCTION

Pseudoaneurysm (PA) formation is a rare but life-threatening adverse event of pancreatitis.[1] Ruptured PAs account for 60% of cases of pancreatitis-related acute hemorrhage, which carries a mortality of 34% to 52%.[2,3] Up to 75% will spontaneously rupture; therefore, several guidelines recommend urgent treatment.[4] Endovascular treatment is the treatment of choice[5]; however, EUS-guided embolization can be an effective salvage strategy.[6-8]

CASE REPORT

This report presents the case of a 54-year-old male with a history of recurrent alcoholic pancreatitis who presented with epigastric abdominal pain. Laboratory tests were notable for elevated lipase and acute on chronic anemia. CT angiography revealed a 2.2-cm PA in the vicinity of the pancreatic neck, in addition to signs of interstitial pancreatitis (Fig. 1). Catheter-guided embolization was attempted by interventional radiology, but the exact origin of the PA could not be identified. After interdisciplinary discussion, the patient was transferred to our institution, and an EUS-guided approach was performed.

EUS demonstrated a thick-walled 29- × 28-mm (inner lumen 28 × 15 mm) PA adjacent to the celiac trunk with arterial flow (Fig. 2). The vessel of origin was not identified by EUS either. This was accessed via a 22-gauge FNA needle (Echotip; Cook Medical, Bloomington, Ind, USA) through the duodenal bulb. This approach provided a shorter distance and stability. Because this was a PA with much higher pressure/flow compared with a varix, we did not want to risk a larger puncture site, and cyanoacrylate monotherapy would have a high rate of distant embolization. A 22-gauge EUS needle can only accommodate 0.018-inch-thick vascular coils. Pushable 0.018-inch coil deployment is the same as a pushable 0.035-inch coil.[9] Typically, a coil diameter approximately 20% larger than the vessel diameter is chosen to reduce the risk of coil migration, but a diameter that fit this criteria was not available; therefore, given the narrow "neck" of the PA, we were less concerned about migration. Two 0.018-inch coils (MicroNester 18-14-10; Cook Medical), which were 14 cm in length and 10 mm in diameter, were advanced into the PA via the needle with difficulty, requiring a hemostat to advance the stylet to push the coils. Doppler flow was still seen within the PA, but a third coil may not have been able to be deployed fully, given the difficulty. The needle was flushed with 1.5 mL of 5% dextrose (D5) solution before and after each coil deployment to prevent cyanoacrylate hardening within the needle. Some providers flush with a hypertonic solution such as D50, but our preference is to use an isotonic D5 solution to avoid theoretical tissue injury from fluid shifting. Then, 1 mL of a 50/50 mixture of lipiodol and n-butyl-2-cyanoacrylate (Histoacryl; B. Braun Medical Inc, Bethlehem, Pa, USA) was injected into the cavity, followed by a 1.5-mL D5 flush. Lipiodol contrast was included to allow for fluoroscopic visualization of any distal embolization, although this does slow the polymerization of the cyanoacrylate. Further injection was attempted, but the needle was occluded. The needle was withdrawn. No collection of blood was seen on the outer surface of the PA. As there was still Doppler flow within the PA, a new 22-gauge needle was used to repuncture, and 1 mL of the glue mixture was injected, after which Doppler imaging from multiple angles did not show any residual flow (Fig. 3). CT angiography the next day revealed successful

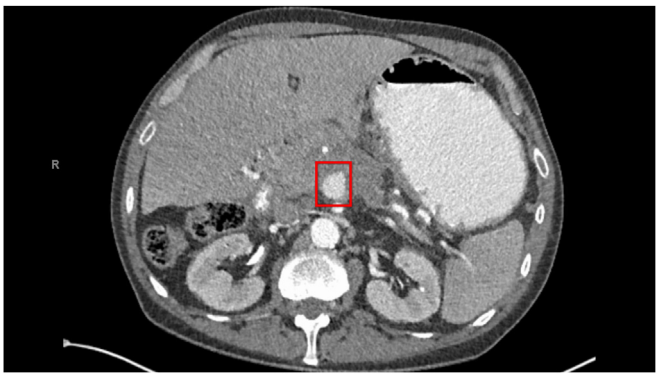

Figure 1. CT abdomen with intravenous contrast showing interstitial acute pancreatitis and contrast filling a pseudoaneurysm (*red box*).

Abbreviations: D5, dextrose; PA, pseudoaneurysm.

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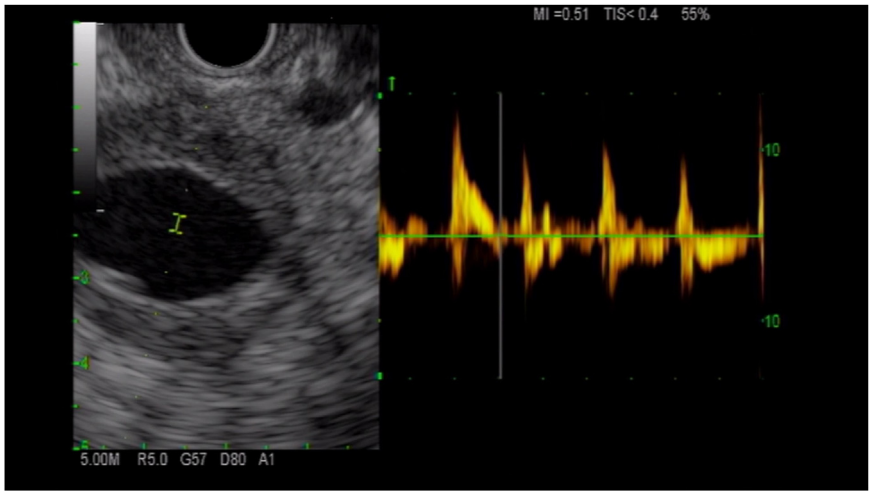

Figure 2. EUS appearance of pseudoaneurysm with pulse wave Doppler confirming arterial flow.

Figure 3. Successful embolization of pseudoaneurysm with coils and cyanoacrylate on EUS and fluoroscopy.

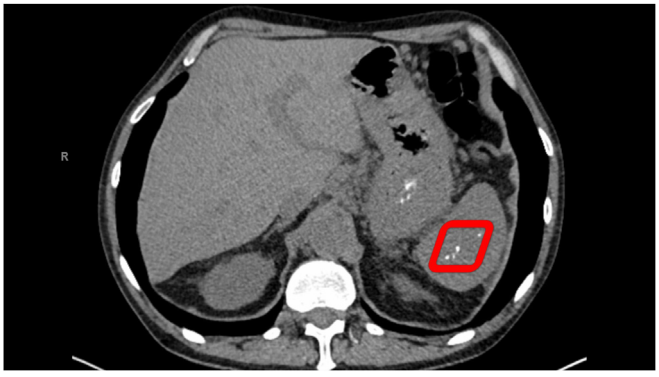

Figure 4. Follow-up CT scan (noncontrast phase) showing embolized cyanoacrylate in the spleen (*red box*).

obliteration of the PA but also showed small splenic and hepatic embolized material with patent arterial vasculature (Fig. 4). In the absence of symptoms or changes in labs, these cyanoacrylate emboli are of unlikely clinical significance. The patient was discharged home on the third day after the procedure. He did clinically well without signs of hemorrhage with over 3 years of follow-up with his local providers (Video 1, available online at www.videogie.org).

DISCUSSION

This case demonstrates EUS-guided embolization as an effective strategy to manage PAs as a sequalae of pancreatitis, particularly in situations in which endovascular attempts fail. Splenic infarction after catheter-guided endovascular procedures for PAs off the celiac trunk or splenic artery have a variable occurrence rate of up to 24%.[5,10,11] In our patient, the finding of splenic and hepatic emboli is of unclear clinical significance; however, it demonstrates the risks associated with EUS-guided PA embolization. The use of coils before cyanoacrylate injection or rapidly polymerizing cyanoacrylate or other embolizing agents may help minimize this risk.[6,12]

PRIVACY

Informed consent was obtained from the patient. All identifying patient information has been removed to protect patient privacy.

AUTHOR CONTRIBUTIONS

Drs Phung and Azeem wrote the manuscript. Dr Azeem participated in the procedure. Dr Mallery performed the procedures and reviewed and edited the manuscript.

DISCLOSURE

Dr Azeem is a consultant for Boston Scientific. All other authors disclosed no financial relationships relevant to this publication.

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