VIDEO CASE REPORT

Endoscopic ultrasound–guided embolization of refractory splenic pseudoaneurysm

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BACKGROUND

Visceral arterial pseudoaneurysms are common sequelae of chronic pancreatitis, occurring in 10% of patients, and carry a non-negligible 50% risk of rupture and 14% to 50% mortality with rupture.[1-4] Transcatheter arterial embolization (TAE) is an effective modality for treatment of visceral arterial pseudoaneurysms with high technical and clinical success rates (97%-100% and 94%-100%, respectively) but a variable adverse event rate of splenic infarction of 6% to 24%.[1-4] However, in cases refractory to TAE, EUS embolization approaches have demonstrated clinical efficacy, with studies demonstrating up to 100% technical and clinical success in this setting when using thrombin or cyanoacrylate glue.[1,5]

CASE PRESENTATION

We present a case of a 45-year-old woman with decompensated alcoholic cirrhosis with portal hypertension, esophageal and gastric varices, loculated ascites, and large intra-abdominal and pelvic abscesses with multiple percutaneous drainage procedures as well as chronic alcoholic pancreatitis complicated by splenic pseudoaneurysm. She was transferred to our institution from an outside hospital for management of recurrent upper GI bleeding secondary to a splenic arterial pseudoaneurysm that, although not confirmed on endoscopy, was seen on outside CT with angiography. This was her third bleeding episode in 4 months. She was previously treated twice with percutaneous TAE by our Interventional Radiology Service, and because of radiographic evidence of persistence of the pseudoaneurysm, a third embolization procedure was performed.However, on repeated CT with angiography (Fig. 1), there was a persistent splenic arterial pseudoaneurysm, and the patient continued to require blood transfusions because of ongoing blood loss.

The decision was made to pursue EUS-guided embolization using thrombin and cyanoacrylate glue without coils (Video 1, available online at www.giejournal.org; Figs. 2-4) with the patient under general anesthesia. Two grams of intravenous ceftriaxone were given as bacterial prophylaxis during the procedure to minimize risk of bacteremia. We

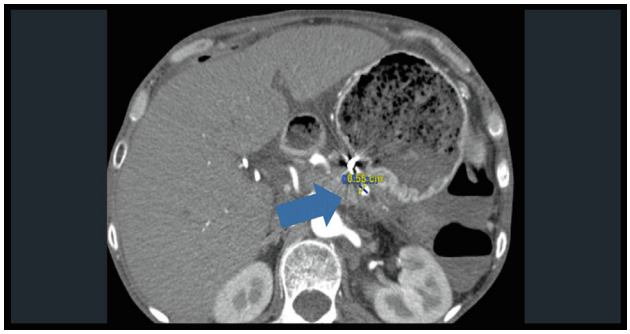

Figure 1. CT angiography showing splenic arterial pseudoaneurysm.

opted to forgo the use of coils owing to the size of the pseudoaneurysm as well as the multiple coils both distal and proximal to the residual pseudoaneurysm. The splenic pseudoaneurysm was identified with transgastric, EUS-guided localization with both power wave and color wave Doppler as well as identification of the yin-yang sign, a well-described and characteristic sign of pseudoaneurysms on sonography resulting from the bidirectional flow of swirling blood within the pseudoaneurysm. With use of a 22-gauge FNA needle (EchoTip, Ultra Endoscopic Ultrasound Needle; Cook Medical, Bloomington, Ind, USA), the pseudoaneurysm was accessed, and contrast was injected under fluoroscopy to confirm location within the pseudoaneurysm (located between previous TAE coils). Eight hundred units of thrombin (Thrombin-JMI; Pfizer, New York, NY, USA) were injected into the pseudoaneurysm via the FNA needle, followed by injection of 0.5 mL of cyanoacrylate glue (2-octyl cyanoacrylate; Ethicon Inc, Somerville, NJ, USA). After injection of the cyanoacrylate glue, careful withdrawal of the FNA needle was performed with simultaneous flushing of water through the needle to prevent clogging within the scope as well as prevention of formation of a glue cast at the injection site, which can result in bleeding if rupture occurs. The needle was maintained outside of the tip of the scope for 30 seconds to allow for drying of any residual glue on the needle tip, prior to withdrawal through the channel of the scope.

The embolization resulted in complete obliteration of the pseudoaneurysm as demonstrated by absence of blood flow on color wave Doppler and by cross-sectional imaging

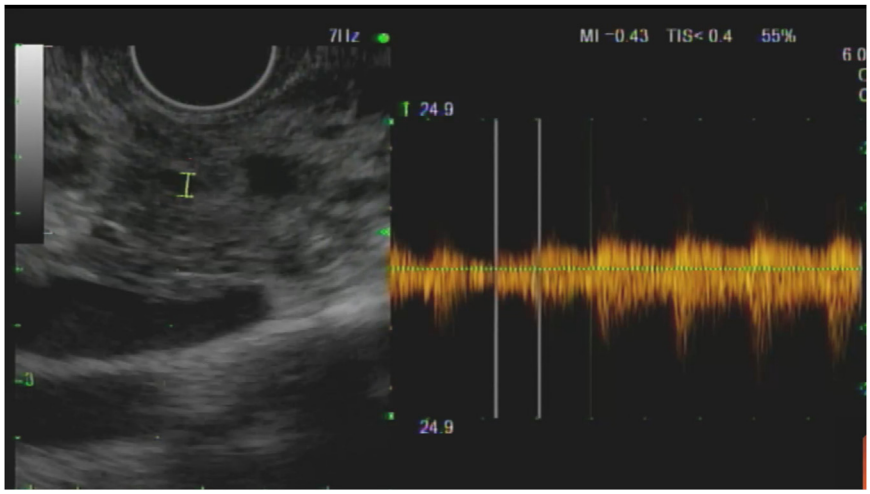

Figure 2. EUS power wave Doppler identification of splenic pseudoaneurysm.

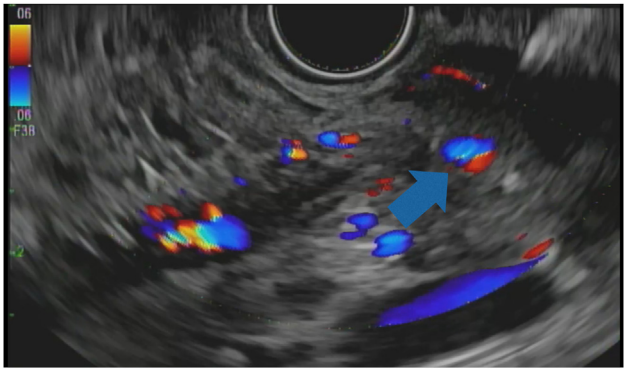

Figure 3. EUS color wave Doppler identification of splenic pseudoaneurysm and yin-yang sign.

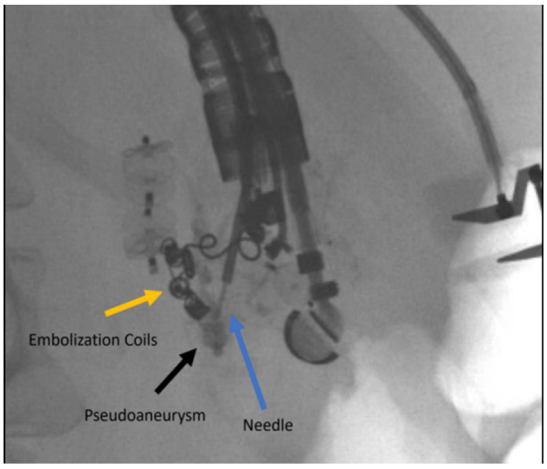

Figure 4. Fluoroscopic confirmation of pseudoaneurysm. The *yellow arrow* demonstrates the previous embolization coils; the *blue arrow* demonstrates the 22-gauge FNA needle; and the *black arrow* demonstrates the pseudoaneurysm with injected contrast.

with repeat CT. At 11 months after follow-up, the patient has not had any recurrence of bleeding.

CONCLUSION

Endoscopic ultrasound–guided embolization of visceral arterial pseudoaneurysms is a useful, safe technique for obliteration of pseudoaneurysms refractory to TAE, as demonstrated in our case. For embolization, we elected to forgo the use of coils, given the size of the persistent pseudoaneurysm, which was already flanked by coils placed via the previous TAE procedures.

DISCLOSURE

Dr Villa is a consultant for Medtronic plc and Olympus Corporation. Dr Boulay is a consultant for Boston Scientific Corporation. All other authors disclosed no financial relationships.

Abbreviation: TAE, transcatheter arterial embolization.

REFERENCES

1. Maharshi S, Sharma SS, Sharma D, et al. Endoscopic ultrasound-guided thrombin injection, a management approach for visceral artery pseudoaneurysms. Endosc Int Open 2020;8:E407-12.
2. Loffroy R, Guiu B, Cercueil JP, et al. Transcatheter arterial embolization of splenic artery aneuryss and pseudoaneurysms: short- and long-term results. Ann Vasc Surg 2008;22:618-26.
3. Xin J, Xiao-ping L, Wei G, et al. The endovascular management of splenic artery aneurysms and pseudoaneurysms. Vascular 2011;19:257-61.
4. Tulsyan N, Kashyap VS, Greenberg RK, et al. The endovascular management of visceral artery aneurysms and pseudoaneurysms. J Vasc Surg 2007;45:276-83.

5. Rai P, Harish KC, Goel A, et al. Endoscopic ultrasound-guided coil and glue for treatment of splenic artery pseudo-aneurysm: new kid on the block! Endosc Int Open 2018;6:E821-5.

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