A 36-year-old Asian man with severe portal hypertension due to hepatitis B virus-related cirrhosis had been previously treated for acute gastrointestinal bleeding from a large isolated gastric varix (IGV-1) by injection of endoscopic cyanoacrylate glue at a local hospital (Fig. 1). Following an episode of massive recurrent hematemesis, the patient was hemodynamically stabilized and referred to our institute. Radiological evaluation revealed the presence of numerous collaterals in the gastric fundus with a large-caliber splenorenal shunt.

With the patient under general anesthesia, it was found that the portal gradient did not decrease significantly with a transjugular intrahepatic portosystemic shunt (TIPS) positioned across the left hepatic and left intrahepatic veins [1], confirming that blood outflow was predominantly diverted towards the shunt (Fig. 2a). We then decided to use a same-session combined technique involving balloon-occluded retrograde transvenous obliteration (B-RTO) of the left renal vein [2] and selective endoscopic ultrasound (EUS)-guided variceal embolization [3, 4] by coils and n-butyl-2-cyanoacrylate (CYA) injection.

A B-RTO was performed to obliterate the left renal vein before EUS-guided selective treatment in order to protect the pulmonary circulation from systemic embolization (Fig. 2b). Gastric varices (IGV-1) were then visualized from the stomach with a linear-array endoscope. Selective EUS-guided intravascular puncture was performed with a 22-gauge fine needle aspiration (FNA) needle (EZ Shot 3 Plus; Olympus Europe) and three 0.018-inch coils (MReye Embolization Coil; Cook Medical) were released through the needle under EUS and fluoroscopic control (Video 1), the endovascular coils being advanced into the targeted vessel using the pushing action of the stylet. Following the complete deployment of each coil, 1 mL of CYA, 3 mL of Lipiodol, and 10 mL of 5% glucose solution were injected through the needle into the varix creating a full thrombosis. We released a total of three coils (Fig. 2c) with complete variceal embolization as confirmed by a negative color Doppler scan. No adverse events or rebleeding had been reported at 12 months of follow-up.

**Fig. 1** Endoscopic view of a large isolated gastric varix (IGV-1) with signs of recent glue injection.

**Fig. 2** Radiographic images showing: a contrast medium injected via a catheter inserted through the transjugular intrahepatic portosystemic shunt (TIPS) into the splenic vein, which confirmed portal outflow in the direction of a large splenorenal shunt (asterisk); b a balloon-occlusion catheter (asterisk) that had been advanced through the internal jugular access and positioned in the left renal vein to give protective closure of the efferent limbs of gastric varices; c EUS-guided selective embolization, with spiral coils (from 4 – 8 cm in length) having been selectively released according the size and axis of the gastric varix.
EUS-guided coil placement with CYA injection is a feasible and effective additional procedure following TIPS placement in selected patients with severe portal hypertension and refractory bleeding from large IGV-1 varices.

Competing interests
None

References

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