Coil-assisted retrograde transvenous obliteration for gastric varices in a Chinese case

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ABSTRACT

Gastric varices (GVs) accompanied by portal hypertension are one of the leading causes of death in patients with liver cirrhosis. Currently, treatment options include pharmacologic, endoscopic, surgical, and interventional approaches, with endoscopic variceal sclerotherapy as the first-line treatment. However, pharmacologic or endoscopic treatments are often difficult, particularly for a fundal GV with active bleeding. Transjugular intrahepatic portosystemic shunt (TIPS) and balloon-occluded retrograde transvenous obliteration (BRTO) are also widely used to manage GVs.1,2 In China, TIPS with and without embolization of the afferent shunt, aimed at relieving portal hypertension to treat bleeding GVs caused by portal hypertension, are well received. However, the TIPS procedure does not always result in complete regression of the bleeding GVs caused by portal hypertension, are well received. However, as afferent feeding veins were in complete stasis. Finally, the catheters and sheath were removed. Throughout the procedure, the patient’s pressure, pulse, electrocardiogram, and arterial oxygen saturation were well maintained. Prior to the intervention, the patient’s model for end-stage liver disease (MELD) score was 7.

The CARTO procedure was performed with moderate sedation. First, a 13-mm diameter. The model for end-stage liver disease (MELD) score was 7.

Case report

The study was approved by the ethics committee of the First Affiliated Hospital of Zhengzhou University (2020-KY-421). A 59-year-old patient with a history of hepatitis B cirrhosis for 8 years was referred for GV bleeding. Preoperative triple-phase contrast-enhanced computed tomography (CT) showed isolated fundal GVs with an efferent gastrorenal shunt with a 13-mm diameter. The model for end-stage liver disease (MELD) score was 7.

The CARTO procedure was performed with moderate sedation. First, we achieved right common femoral venous access. A 10 Fr vascular sheath (Cook Inc., Bloomington, IN, USA) was placed in the inferior vena cava and left renal vein for stable access. Using two 5 Fr headhunter catheters (Cook Inc.) under the guidance of a 0.035 inch guidewire, the efferent shunt was accessed. Through the more proximally placed catheter within the efferent shunt, five interlock detachable coils (14 × 40 mm; Boston Scientific Co.) were deployed, and complete occlusion of the efferent shunt was confirmed with a venogram. Through the distally placed catheter, gelfoam slurry (two packs) mixed with a contrast agent was injected until the entire gastrorenal shunt, varices, collaterals, and afferent feeding veins were in complete stasis. Finally, the catheters and sheath were removed. Throughout the procedure, the patient’s blood pressure, pulse, electrocardiogram, and arterial oxygen saturation were well maintained. Prior to the intervention, the patient’s model for end-stage liver disease (MELD) score was 7.

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monitored and remained stable.

A triple-phase contrast-enhanced CT of the abdomen 3 days post-procedure showed a successful complete obliteration of the efferent shunt, GVs, and afferent feeding veins. No thrombosis in the portal system, renal vein, or inferior vena cava was detected. The patient showed no signs of complications and was discharged uneventfully.

During the 3-month follow-up, the patient showed no recurrence of variceal hemorrhage, laboratory test results were normal, and contrast-enhanced CT showed continued complete obliteration of the GVs.

Discussion

BRTO has been adapted for the management of GV bleeding. BRTO has high efficacy in stopping acute GV bleeding and has been shown to have a significantly lower rebleeding rate than TIPS or endoscopic treatment. However, BRTO requires the use of an indwelling occlusive balloon inflated for hours with injection of sclerosing agents such as ethanolamine oleate or sodium tetradecyl sulfate, resulting in lengthy procedure times additional hospital resources and logistics (e.g., intensive care unit bed, additional patient transport, additional interventional radiology suite time, and staff) and the innate complications associated with balloons (e.g., balloon rupture). Sclerosing agents are also associated with some of the serious complications of BRTO, including pulmonary edema, disseminated intravascular coagulation, portal vein thrombosis, severe renal dysfunction, and anaphylactic reaction. Therefore, in China, BRTO has not been adopted as the main treatment for bleeding GVs owing to the aforementioned complications. In addition, commonly used sclerosing agents are not available.

Modified BRTO procedures, CARTO and PARTO, have the same effectiveness as conventional BRTO, which has been confirmed by Lee and colleagues and have become the standard of care at many institutions for the treatment of GVs. Modified BRTO has several....
advantages. First, using a coil or vascular plug instead of a balloon for vascular occlusion avoids some of the complications (balloon rupture) and difficulties associated with indwelling balloon catheters. Second, using gelfoam slurry as the embolic material instead of sclerosing agents reduces some of the previously reported serious complications associated with BRTO with sclerosing agents, including death, pulmonary embolism, pulmonary edema, portal vein and/or splenic vein thrombosis, renal vein thrombosis, renal failure, and anaphylactic reaction. Third, modified BRTO does not require selective embolization of the collateral veins in most cases. Fourth, the techniques are less invasive than TIPS, with the benefit of improved hepatic function. Lastly, gelfoam is inexpensive and readily available. The present case had a satisfactory outcome with complete obliteration of the GVs without any complications. Considering this case and a review of the literature, we believe that modified BRTO would be a good treatment option for GV bleeding caused by portal hypertension in China in the future.

In conclusion, we report a Chinese case of portal hypertensive GV bleeding treated using CARTO with a coil and gelfoam slurry. Advantages of this technique include avoiding indwelling balloon catheters and complications related to sclerosant use. CARTO may have great potential to be widely accepted for the treatment of bleeding GVs in China.

Ethics approval and consent

The study was approved by the ethics committee of the First Affiliated Hospital of Zhengzhou University (2020-KY-421). The study was conducted according to the principles of the Declaration of Helsinki. Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Declaration of competing interest

The authors of this manuscript declare no relationships with any companies, whose products or services may be related to the subject matter of the article.

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