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Case Report

Gastric variceal hemorrhage treated with percutaneous transhepatic embolization with balloon-occluded antegrade transvenous obliteration

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ABSTRACT

We report a case of gastric variceal hemorrhage where high model for end-stage liver disease score and the complex gastric variceal anatomy precluded the use of both transjugular intrahepatic porto-systemic shunt and standard balloon-occluded retrograde transvenous occlusion (BRTO) procedures respectively. The patient was successfully managed by percutaneous transhepatic coil embolization combined with BRTO. It is of great importance to obtain an accurate cross-sectional image to evaluate the anatomical variances of gastric varices that will lead to appropriate vascular access and to choose a suitable embolization method.

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Keywords: Balloon; Embolization; Gastric varix; Transhepatic

Introduction

Gastric varices are less common than esophageal varices, however bleeding gastric varices are difficult to treat endoscopically and have high mortality (14%–45%). When first line treatment of endoscopic sclerotherapy/ligation fails, transjugular intrahepatic porto-systemic shunt (TIPS) or balloon-occluded retrograde transvenous occlusion (BRTO) are standard options for hemorrhage control.

Case Report

A 45-year-old female with a model for end-stage liver disease (MELD) from primary biliary cirrhosis on liver transplant list; past medical history of sarcoidosis, scleroderma, and hypertension presented with acute variceal hemorrhage and hemodynamic instability. Her hemoglobin dropped from 9.0 to 5.6 g/dL requiring 10 units of packed red cell transfusion with improvement on hemodynamic status. Endoscopy showed grade II esophageal varices and actively bleeding gastric varices which could not be controlled by endoscopic means. Patient's MELD score was 29.

Patient's triple phase liver computed tomography was reviewed for variceal anatomy and it showed at least 3 separate

afferent veins contributing to the gastric variceal mass raising the possibility of a type 2 or 3 variceal anatomy. A gastroduodenal shunt was also visualized. TIPS procedure was ruled out due to the patient's high MELD score and a standard BRTO procedure was thought to be challenging based on the variceal anatomy as there were multiple feeding branches to the gastric varices; hence decision was made to combine direct portal access for coiling of the variceal feeders and then to proceed with BRTO.

The right portal vein was accessed via transhepatic approach under ultrasound guidance using a 21-gauge AccuStick needle (Accustick®; Boston Scientific, Natick, MA, USA). The rest of the procedure was performed through the 5F Accustick outer sheath. Portal venogram showed dilated and tortuous gastric varices supplied by left gastric, posterior gastric and short gastric branches (Fig. 1A, 1B). Delayed phase of the venogram showed a prominent draining gastroduodenal shunt (Fig. 1C). Direct portal venous pressure was 17 mmHg.

Initially, the left and posterior gastric veins were successfully catheterized and were coiled with combination of Concerto (Concerto™; Covidien, Dublin, Ireland) and Ruby coils (Ruby® Coil; Penumbra, Alameda, CA, USA) (Fig. 1C). Then, the short gastric afferent vein was cannulated with microcatheter and the catheter was connected to a saline drip line. Next, the left renal vein was

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Fig. 1. (A) Transhepatic portogram illustrates the gastric varix (dashed arrow), the short gastric vein feeder (short arrow) and the posterior gastric vein feeder (long arrow). (B) Later phase portography shows a better opacification of the dilated and tortuous gastric varix (dashed arrow); left and posterior gastric veins afferents are also demonstrated (long and short arrows, respectively). (C) Portography demonstrates successful coil embolization of the left and posterior gastric veins (long and short arrows, respectively). The gastric varices (dashed arrow) are filled with contrast by injection via microcatheter thorough the short gastric afferent (black arrowhead) and a gastroduodenal shunt (white arrowhead) is also visualized. (D) Anteroposterior view confirms the Berenstein occlusion balloon catheter (white arrowhead) placed via femoral approach inflated in the gastroduodenal shunt and microcatheter placed in the short gastric afferent for antegrade sclerosant injection.

catheterized via a right common femoral vein access. Venogram showed the gastroduodenal shunt, which was catheterized using a Berenstein occlusion balloon catheter (Boston Scientific) (Fig. 1D). After inflating the balloon, sclerotherapy was performed in an antegrade fashion via the microcatheter in the short gastric vein. Sodium tetradecyl sulphate mixed with contrast was used for sclerotherapy. The sclerosant was allowed to sit in the variceal mass for 45 minutes before deflating the balloon in the gastroduodenal shunt. The short gastric afferent vein was also coil embolized prior to removal of the microcatheter. An Amplatzer vascular plug (St. Jude Medical, St. Paul, MN, USA) and gelfoam torpedos were deployed in the hepatic parenchyma as the Accustick sheath was removed. The procedure was successful in stopping the variceal bleed and subsequently the patient received a successful liver transplantation 2 weeks following the procedure.

Discussion

This case highlights the importance of tailoring the treatment for gastric varices to each patient based on the clinical scenario and the anatomy as these have higher mortality rates compared to esophageal varices.¹ In this patient, the high MELD score precluded TIPS due to the very high post procedural mortality. BRTO would be the standard second option, however the presence of multiple feeders (type 2 or type 3 afferent configuration) to the gastric variceal mass will make the procedure challenging as these feeders have to be individually catheterized in a retrograde fashion and then coiled prior to sclerotherapy in order to prevent the

reflux of sclerosant into the portal system.²

It was decided to proceed with accessing the gastric variceal feeders via a transhepatic approach as it is simpler compared to the retrograde access via the renal vein and this technique is well described in the Japanese literature.³ Once these afferent or feeding vessels are identified, they can be coiled off easily and sclerotherapy can be performed via any of these branches in an antegrade fashion. Prior to sclerotherapy, the out flow should be blocked, which is performed by inflating a balloon in the gastroduodenal shunt as in standard BRTO procedure. Coiling the afferent veins alone is unlikely to be effective and sclerotherapy ensures clinical success in gastric varices.⁴ We believe this technique is an effective alternative for gastric variceal hemorrhage control in high risk patients with complex variceal anatomy.

Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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