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Rescue Transsplenic Gastric Varices Embolization in a Patient of Massive Gastric Variceal Bleed Secondary to Complete Splanchnic Portal Venous System Thrombosis

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Abstract

Endoscopic sclerotherapy is the first-line modality to manage gastric variceal bleeding; however, knowledge of other treatment options is also essential, especially in case of failure of the endoscopic approach. We are reporting a rare case of successful rescue gastric varices embolization through the transsplenic route in a gastric varices bleeding patient who presented with massive hematemesis and blood from the ileostomy drain site secondary to complete splanchnic portal venous system thrombosis when all other treatment options were not feasible or unsafe. Proper cross-sectional imaging evaluation, knowledge of treatment options, and understanding of intraprocedural challenges are essential for managing gastric varices.

Keywords
- gastric varices
- embolization
- gastrointestinal hemorrhage

Introduction

Endoscopic sclerotherapy is the first modality to treat gastric varices (GV) bleeding. In case of failure of the endoscopic approach, other possible treatment options for managing GV are balloon- or plug-assisted retrograde transvenous obliteration of GV (BRTO/PARTO), transjugular intrahepatic portosystemic shunt (TIPS), partial splenic artery embolization (PSE), splenectomy, or percutaneous transhepatic embolization. Here, we present a rare case of active GV bleed secondary to thrombosis of the entire portal vein (PV), superior mesenteric vein (SMV), and splenic vein (SV), which was managed successfully through a rescue percutaneous transsplenic embolization when no other possible treatment options were feasible or safe.

Case Report

A 39-year-old male patient came to our emergency with severe pain, abdominal distention, tenderness with guarding, and rigidity with stable vitals. Our institute's contrast-enhanced computed tomography (CECT) revealed hollow viscus perforation, entirely thrombosed PV, SMV, and SV with GV. A quick history revealed that the patient was under treatment for nonspecific abdominal pain in an outside facility for the last 10 days. The patient was immediately shifted to general surgery, and resection of the small bowel was done, and a stoma was created. On postoperative day 7, the patient developed wound dehiscence, which was managed conservatively for the next 2 weeks. The patient was shifted to the gastroenterology department to manage

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splanchnic portal venous system thrombosis. However, the patient wanted discharge against medical advice, and the patient was discharged on tablet apixaban, 10 mg twice a day for 7 days, followed by 5 mg twice a day for lifelong with other medications. After 2 weeks, the patient came to our emergency department again with massive hematemesis and bleeding from the ileostomy drain site. His pulse was 142/min, and his blood pressure was 64/48 mm Hg at the time of presentation. Hemoglobin was 4.6 g/dL. The patient was immediately resuscitated with intravenous fluid, blood transfusion, and noradrenaline support (3 units per hour). The anticoagulation was stopped. Once the blood pressure reached 92/68 mm Hg after resuscitation, the patient was immediately shifted for upper gastrointestinal endoscopy, which showed multiple varices at the gastroesophageal junction and gastric wall with active bleeding from the GV. Sclerotherapy was attempted, but it failed. After the failed endoscopic attempt, an emergent CT was performed, which showed an entirely thrombosed PV, SMV, and SV with large GV and a large amount of hyperdense blood within the distended gastric lumen (►**Fig. 1**). The examination also revealed a large dilated and tortuous short gastric vein (SGV, afferent vein) connecting the SV at the splenic hilum to the fundal GV (►**Fig. 2**). No gastrorenal shunt was noted. The GV had a single afferent vein (type 1, Kiyosue classification) with drainage through multiple small portosystemic collaterals without any recognizable shunt (type D, Kiyosue classification).[1] After discussing the imaging findings with the surgeons and gastroenterologists and based on the patient's clinical status, the patient was immediately shifted for rescue GV embolization through the transsplenic route. A 5-Fr introducer sheath was placed in the SV through the splenic parenchyma using the Seldinger's technique. A contrast angiography demonstrated the SGV and dilated GV in the gastric fundal region (►**Fig. 3**). Then, using a 5-Fr multipurpose angiographic catheter (Cook, United States) and a 2.4-Fr microcatheter (Progreat, Terumo, Japan) the GV was selectively catheterized, and embolization was performed using 40% n-butyl-2-cyanoacrylate (NBCA) mixed with lipiodol. Postembolization angiography showed completely embolized GV and SGV (afferent vein). The entire splenic venous flow was diverted from the GV to the spleen. At the end of the procedure, the transsplenic tract was embolized using the same NBCA-lipiodol mixture. After 24 hours of poststabilization, an upper gastrointestinal endoscopy was done, which showed small esophageal varices with red color signs in two columns for which variceal ligation was done. The patient was discharged in stable condition after 7 days of hospitalization with no further bleeding episodes. The patient was informed about the future risk of developing ectopic varices and bleeding; however, the patient refused and did not give consent for any further intervention and chose to be on conservative management (tablet apixaban, 10 mg twice a day for 7 days, followed by 5 mg twice a day for lifelong). The patient is getting treatment for short bowel syndrome due to surgical resection of the gangrenous small bowel. A prothrombotic workup was also done, which was unremarkable. On follow-up, relook endoscopy was done after 3 weeks, 6 months, and 12 months, which showed obliterated esophageal varices and GV. The patient is doing fine and there is no evidence of any gastrointestinal bleeding or drop in hemoglobin during the follow-up.

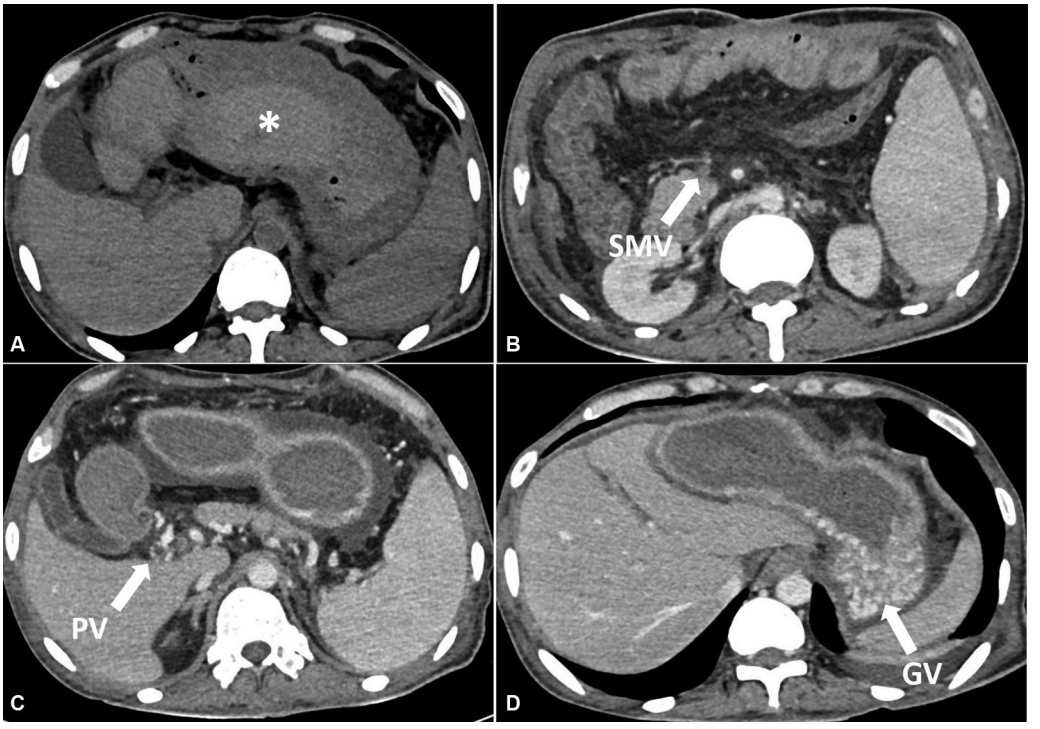

Fig. 1 Noncontrast computed tomography (CT) axial image (**A**) showing a distended stomach with hyperdense blood (asterisk) within it. Contrast-enhanced CT axial images (**B–D**) showing thrombosed portal vein (PV), superior mesenteric vein (SMV) with gastric varices (GV) along the fundus of the stomach.

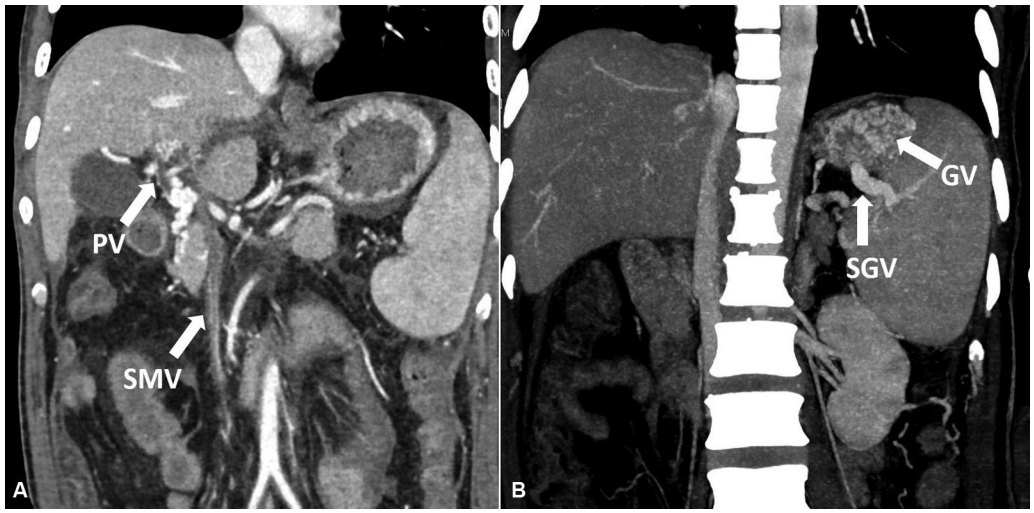

Fig. 2 Contrast-enhanced computed tomography (CT) coronal image (**A**) showing thrombosed portal vein (PV) and superior mesenteric vein (SMV). (**B**) Showing a dilated short gastric vein (SGV) connecting the splenic vein at the splenic hilum to the fundal gastric varices (GV). No gastrorenal shunt was present.

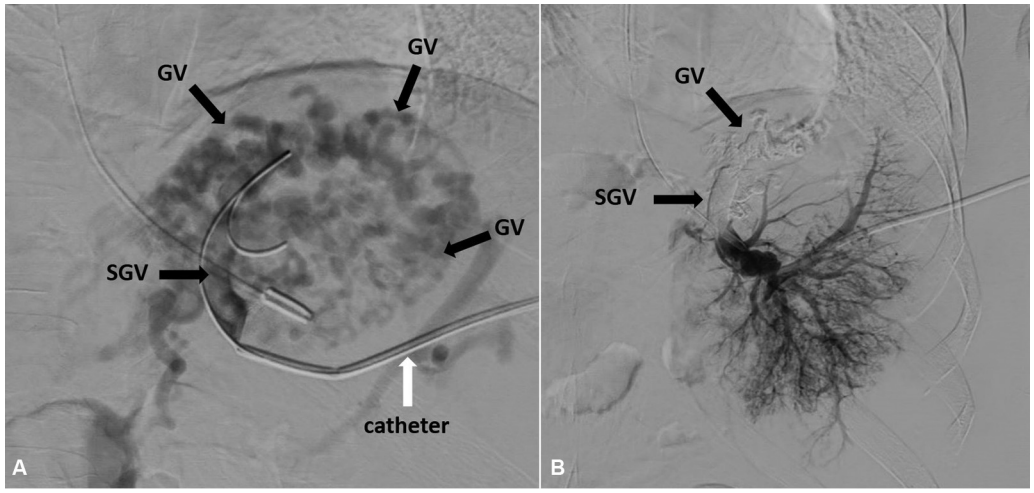

Fig. 3 (**A**) Preembolization contrast angiography demonstrating the short gastric vein (SGV) and dilated gastric varices (GV). (**B**) Postembolization contrast angiography showed completely embolized GV and short gastric vein (SGV). A glue cast is seen within the thrombosed GV and SGV.

Discussion

GV bleed at comparatively lower portal pressure than the esophageal varices, and the mortality rate (14–45%) is high when they present with bleeding. Endoscopic sclerotherapy is the first modality to treat GV bleeding.[2] BRTO/PARTO was not practicable as there was no gastrorenal shunt. TIPS can be performed to manage GV even in PV thrombosis cases but was not preferred in our patient as the entire splanchnic portal venous system was thrombosed, and no patent vascular segment was available to place the stent. Additionally, balloon dilatation, thrombectomy, or local thrombolysis of the thrombosed portal circulation was avoided in our patient as the patient was actively bleeding and was on noradrenaline support. PSE can reduce the SV flow to these GV but was not preferred in our patient for multiple reasons. First, partial embolization of a large portion or entire spleen parenchyma in a single procedure leads to severe postembolization syndrome and splenic abscess formation, which could have further deteriorated the patient's condition. Second, partial embolization of the spleen targeting a smaller portion may require multiple embolization settings because the rebleeding rate of GV is high. Wei et al have reported a high rate of rebleeding (~48%) after PSE in GV management secondary to left segmental portal hypertension.[3] Finally, as our patient was actively bleeding and was on noradrenaline support, treatment within a short period would have been appropriate. Splenectomy or the creation of a surgical shunt was avoided in our patient, as he was unlikely to survive an operation. So, we decided on transsplenic GV embolization in our patient. Multiple case reports and case series are present in the literature about the percutaneous transsplenic approach for managing gastrointestinal varices secondary to isolated SV thrombosis (left-sided portal hypertension), isolated PV thrombosis, or chronic liver disease (►**Table 1**).[4–9] Few previous studies have reported a high success rate (91–96%) of the transsplenic approach for GV.[10]

Table 1 Literature review of previous cases/series (transsplenic route)

Author, year of publication	Cause and management
Higashino et al, 2022	Embolization of jejunal varices after pancreaticoduodenectomy
Tanaka et al, 2022	Embolization of gastric varices secondary to pancreatic carcinoma invading the splenic vein
Hong et al, 2021	Embolization of varices surrounding the pancreaticojejunostomy site after pancreaticoduodenectomy
Martins et al, 2020	Embolization of gastric varices secondary to portal vein thrombosis
Kim et al, 2020	Embolization of duodenal varices secondary to chronic liver disease
Gong et al, 2001	Embolization of gastroesophageal varices secondary to portal vein thrombosis in hepatocellular carcinoma patients (18 patients)

The most common complication associated with the transsplenic approach is subcapsular splenic hematoma (12–20%), which can be reduced by embolizing the transsplenic tract using the NBCA-lipiodol mixture at the end of the procedure.[10] Most patients respond well to these rescue embolization measures, especially noncirrhotic patients; however, the underlying portal hypertension has to be addressed to avoid the recurrence of new varices. Therefore, regular follow-up with endoscopy and CECT is necessary. In cases of repeated bleeding, these patients can be referred for more definitive therapy, such as TIPS, splenectomy, and devascularization, in an elective setting. A long-term follow-up is crucial to managing these patients.

Conclusion

Proper cross-sectional imaging evaluation, knowledge of drainage anatomy, and understanding of intraprocedural challenges are essential for successfully treating GV using the transsplenic route. Endovascular techniques can be used with the caveat that these techniques typically offer temporary relief. These patients might require definitive therapy for underlying portal hypertension in the future, such as splenectomy and devascularization.

Consent for Publication

Written informed consent for publication of his clinical details and/or clinical images was obtained from the patient.

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Conflict of Interest

None declared.

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