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Case Report *Vascular Interventions*

Inadvertent iatrogenic splenic vein occlusion resulting in sinistral portal hypertension and massive gastric variceal hemorrhage

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ABSTRACT

A 27-year-old man with history of Budd–Chiari syndrome complicated by portal hypertension presented to an outside hospital with melena and hematemesis. He underwent direct intrahepatic portocaval shunt (DIPS) placement and variceal embolization. Eleven months later, the patient presented to the authors' institution with recurrent upper gastrointestinal bleeding. DIPS venogram demonstrated a patent stent-graft; however, it also revealed plug occlusion of the splenic vein, inadvertently performed at the time of initial DIPS procedure. Interrupted splenic venous flow gave rise to sinistral portal hypertension, which, in turn, led to exacerbation of gastric varices and development of a massive gastrorenal shunt. Splenic artery embolization and a balloon-occluded retrograde transvenous obliteration were performed, resulting in resolution of gastrointestinal hemorrhage.

Keywords: Balloon-occluded retrograde transvenous obliteration, Direct intrahepatic portocaval shunt, Left-sided portal hypertension, Sinistral portal hypertension

INTRODUCTION

Left-sided, or sinistral, portal hypertension is a rare cause of upper gastrointestinal bleeding related to splenic vein thrombosis or occlusion, most commonly a result of pancreatic inflammatory and neoplastic processes.[1] This may lead to the development or worsening of gastric and esophageal varices, heightening the risk of life-threatening hemorrhage.[2] We present the first case of sinistral portal hypertension and resultant massive upper gastrointestinal bleed secondary to inadvertent, iatrogenic plug occlusion of the splenic vein during direct intrahepatic portocaval shunt (DIPS) procedure.

CASE REPORT

A 27-year-old man with a history of ulcerative colitis and Budd–Chiari syndrome complicated by portal hypertension presented to an outside hospital with melena and hematemesis requiring vasopressor support. Esophagogastroduodenoscopy (EGD) demonstrated large gastric varices with recent stigmata of bleeding. Interventional radiology was consulted for consideration

of transjugular intrahepatic portosystemic shunt. Per an outside hospital report, the hepatic veins were not able to be catheterized due to thrombosis, confirmed on transabdominal ultrasound. The patient underwent DIPS placement from the inferior vena cava to the right portal vein. Venography shows two veins which were identified as "large left gastric varices" with brisk flow after deployment of the DIPS. The "distal" and "proximal" varices were then occluded with a combination of plugs and coils [Figure 1].

Eleven months later, the patient presented to the authors' institution with large volume hematemesis and hematochezia. EGD revealed a large volume of blood in the stomach and distended gastric varices, prompting emergent DIPS venography. Initial portography demonstrated a patent DIPS stent-graft and opacification of multiple gastric varices. Portosystemic gradient measured 6 mmHg initially, then 4 mmHg after angioplasty of the stent. Subsequently, catheterization of the varices was attempted. Images revealed occlusion of the splenic vein due to a vascular plug, which was placed during the initial DIPS procedure [Figure 2]. Attempts to catheterize beyond this plug were unsuccessful. Massive hematemesis with decline in hemodynamic status necessitated vasopressor support, prompting the decision to proceed with splenic artery coil embolization in effort to decrease intrasplenic pressure. The patient was then transferred to the intensive care unit for further resuscitation.

Given continued upper gastrointestinal bleeding, retrograde transvenous obliteration of the gastric varices was initiated. Multiple attempts to occlude a large gastrorenal shunt through the left renal vein using an Amplatzer plug (Abbott, Plymouth, MN, USA) and coils were unsuccessful given the large diameter of the shunt neck. The plug was removed, and a 20 mm × 4 cm balloon catheter was advanced into the shunt neck and inflated [Figure 3]. A microcatheter was advanced through the balloon catheter coaxially, and a 1:2 mixture of ethiodized oil and sodium tetradecyl sulfate was injected through the shunt into the varices. The balloon remained inflated for 12 h with resolution of gastrointestinal bleeding and transfusion requirements and the patient was subsequently discharged in stable condition. He ultimately

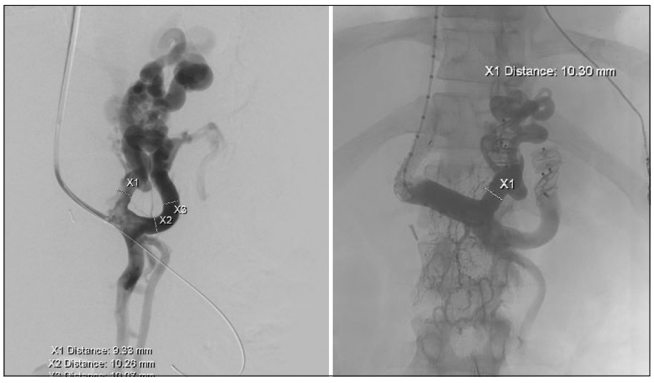

Figure 1: A 27-year-old male with Budd–Chiari syndrome presenting to outside hospital with hematemesis and melena. Left image with venography which shows the two vessels that were identified as the "distal" and "proximal" left gastric varices at the outside facility. Right image shows post embolization venography of the two targeted veins.

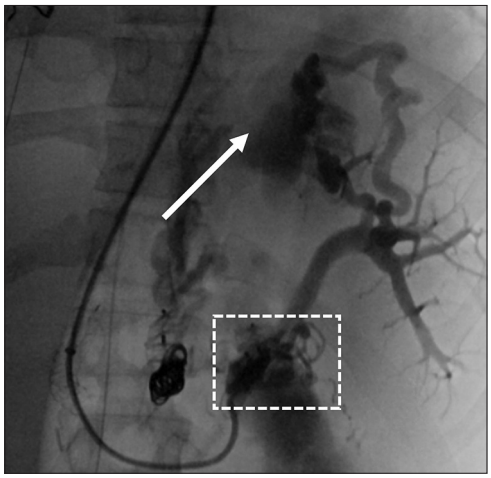

Figure 2: A 27-year-old male with Budd–Chiari syndrome status post-direct intrahepatic portocaval shunt and variceal embolization at outside the hospital. Patient presents to our facility with large volume hematemesis and hematochezia. Venography shows plug occlusion of the splenic vein (white box), with contrast filling gastric varices through short gastric veins (white arrow).

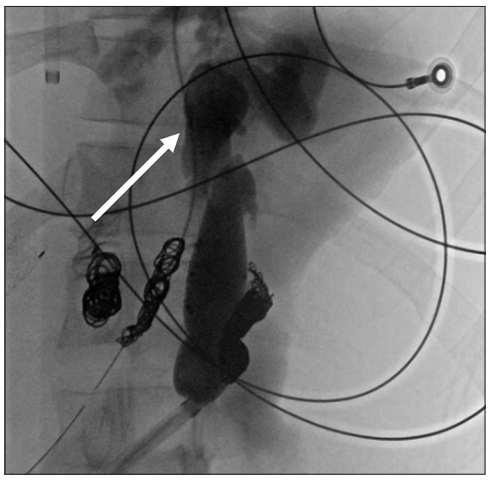

Figure 3: A 27-year-old male with Budd–Chiari syndrome status post direct intrahepatic portocaval shunt and variceal embolization at outside the hospital. Patient presents to our facility with large volume hematemesis and hematochezia. Venography through the balloon catheter seated in the gastrorenal shunt neck, redemonstrating filling of dilated gastric varices (white arrow).

underwent liver transplantation approximately 1 year after this hospitalization without recurrent hemorrhagic complications.

DISCUSSION

We present a unique case of life-threatening gastric variceal bleeding secondary to inadvertent splenic vein plug occlusion at the time of DIPS placement. This patient developed sinistral portal hypertension due to impaired flow through the splenic vein, resulting in worsening dilatation of gastric varices and development of a large gastrorenal shunt. Splenic artery embolization is a well-described treatment to decrease intrasplenic pressures in patients with sinistral portal hypertension, sometimes requiring subsequent splenectomy.[3] Similarly, balloon-occluded retrograde transvenous obliteration (BRTO) is a proven treatment in cases wherein a patient's pathologic creation of a portosystemic shunt results in variceal hemorrhage.[4] In retrospect, the lack of distal filling of the splenic vein during the attempted gastric variceal embolization at outside hospital [Figure 1] may have been related to preferential flow of contrast through the splenorenal shunt. This may have led the operators at the outside hospital to not correctly identify this vessel as the splenic vein as per outside report this was identified as a left gastric varix. This case emphasizes the importance of accurate intraprocedural vascular identification, appropriate plug sizing, and precise positioning of the plugs or coils within the target vessel during variceal embolization.

CONCLUSION

Iatrogenic, inadvertent occlusion of the splenic vein during DIPS procedure and gastric variceal embolization is a novel etiology of sinistral portal hypertension, which led to massive gastric variceal bleeding. Following appropriate identification of the cause of hemorrhage, resolution was achieved with splenic artery embolization and BRTO. Accurate intraprocedural identification of the vasculature, appropriate plug sizing, and precise positioning within the target vessel are crucial to avoid this complication during variceal embolization.

Ethical approval

The Institutional Review Board approval is not required.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

REFERENCES

1. Köklü S, Coban S, Yüksel O, Arhan M. Left-sided portal hypertension. Dig Dis Sci 2007;52:1141-9.
2. Pereira P, Peixoto A. Left-sided portal hypertension: A clinical challenge. GE Port J Gastroenterol 2015;22:231-3.
3. Wang Q, Xiong B, Zheng C, Liang M, Han P. Splenic arterial embolization in the treatment of severe portal hypertension due to pancreatic diseases: The primary experience in 14 patients. Cardiovasc Intervent Radiol 2016;39:353-8.
4. Saad WE, Sabri SS. Balloon-occluded retrograde transvenous obliteration (BRTO): Technical results and outcomes. Semin Intervent Radiol 2011;28:333-8.

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