



Acute Colonic Variceal Bleeding in a Cirrhotic Patient Treated by Modified Balloon-occluded Retrograde Transvenous Obliteration: A Case Report

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Abstract

Colonic varices are an uncommon type of ectopic varices that can occur due to underlying liver cirrhosis and portal hypertension. They form a very rare cause of lower gastrointestinal bleeding that can result in massive hemorrhage. We present a 38-year-old woman with a background of ulcerative colitis complicated by primary sclerosing cholangitis-induced liver cirrhosis presenting with fresh rectal bleeding. The colonoscopy failed to identify the source of bleeding. Then, computed tomography scan showed multiple dilated tortuous venous collaterals around the descending colon that extended into the colonic submucosa and drained via the left ovarian vein representing colonic varices. She underwent balloon-occluded retrograde transvenous obliteration (BRTO), which successfully embolized these varices with no significant complications. Despite there being no established management guidelines for colonic variceal bleeding, BRTO is a minimally invasive procedure that can be considered as good option for the treatment of these varices, especially when other alternatives are not applicable.

Keywords

- ▶ BRTO
- ▶ bleeding
- ▶ liver cirrhosis
- ▶ colonic varices
- ▶ ectopic varices

Introduction

Patients with cirrhosis are at risk of developing varices at any site in the gastrointestinal tract.¹ Ectopic varices are portosystemic collaterals that arise at sites other than the gastric and esophageal regions.² They are uncommon and form less than 5% of all variceal bleeding and among these, colonic varices are very rare.² As a result, there are no standardized management guidelines for colonic varices.³

In this report, we describe a case of descending colonic variceal bleeding in a patient with liver cirrhosis who presented with fresh rectal bleeding. This case was treated

successfully with balloon-occluded retrograde transvenous obliteration (BRTO), an endovascular procedure typically performed for gastric varices.

Case Presentation

A 38-year-old woman with a background of ulcerative colitis (UC) associated with primary sclerosing cholangitis-induced liver cirrhosis (Child-Pugh Class C) presented with a 2-day history of abdominal pain and fresh bleeding per-rectum and an episode of syncope. There was no history of hematemesis, vomiting, diarrhea, or fever.

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On physical examination, the patient was conscious and oriented. She was deeply jaundiced and had conjunctiva paleness. The abdomen was soft and distended with mild tenderness, and the rectal examination revealed fresh blood.

At the time of admission, the patient was mildly hypotensive with a blood pressure of 95/55 mmHg, had mild tachycardia with a heart rate of 100 bpm, had oxygen saturations of 97% on air, and a temperature of 36.9 °C. Laboratory tests revealed hemoglobin 5 g/dL, platelets 220 10⁹/L, albumin 17 g/dL, total bilirubin 280 g/dL, direct bilirubin 230 g/dL, ALP (alkaline phosphatase) 240 IU/L, ALT (alanine aminotransferase) 22 IU/L, AST (aspartate aminotransferase) 60 IU/L, prothrombin time 19 s, and INR (International Normalized Ratio) 1.8.

The patient was transferred to the intensive care unit where she received blood transfusion with packed red blood cells that stabilized her hemoglobin in the region of 8 g/Dl. She underwent urgent colonoscopy that revealed inflamed fragile mucosa with erythema and ulceration. It showed mild oozing in the distal descending colon but no active bleeding. An upper endoscopy was subsequently performed and showed no active bleeding or submucosal varices.

The patient started on intravenous methylprednisolone 60 mg daily as treatment for UC flare. However, the patient continued to have intermittent bleeding and hemoglobin drop and she received further transfusion of blood and fresh frozen plasma. After 3 days, the patient passed a large volume of blood per rectum, which required massive blood transfusion and temporary use of noradrenaline vasopressor to stabilize the patient's hemodynamic status. She underwent a second colonoscopy that demonstrated mucosal edema and healing ulcers consistent with response to the steroids.

However, as the patient had fresh per-rectal bleeding out of proportion to the colonoscopy findings, she was referred for computed tomography angiogram (CTA) to look for other intra or extra luminal bleeding sources. There was no active bleeding but it showed multiple dilated tortuous vessels in the left iliac fossa around the descending colon and drained into the left ovarian vein representing colonic varices (►Fig. 1). Some of these vessels were seen extending to the submucosal plane of the colon (►Fig. 1B). Features of known liver cirrhosis and portal hypertension were also noted including diffuse ascites and other multiple perisplenic, perigastric, and distal esophageal varices.

Resuscitation was done, but no other medical management was performed due to the emergency nature of the procedure.

After multidisciplinary team discussion between interventional radiology, gastroenterology, and intensive care, a decision was made to carry out BRTO in the emergency setting, as the patient had many recent previous admissions with encephalopathy and was put on the liver transplant list. The aim of BRTO was to occlude the veins protruding into the colonic mucosa, and therefore, stop the ongoing rectal bleeding. The procedure was performed under local anesthesia and sedation in the Interventional Radiology angiography suite. The right common femoral vein was accessed

through which the left renal vein then the left gonadal vein were catheterized using a 5F C1 Torcon NB advantage catheter (Cook Medical, USA). Left gonadal venogram was performed confirming correct position and noting the rapid flow back of contrast to the left renal vein (►Fig. 2A). This was followed by the advance of a 12 mm occlusion balloon catheter (LemMaitre, Sydney, Australia). With the balloon inflated at the left gonadal vein, retrograde venogram showed the large left cologonadal shunt with multiple tortuous collaterals originating from the inferior mesenteric vein and draining into the left gonadal vein representing pericolic varices (►Fig. 2B) around the descending colon corresponding to CT scan findings (►Fig. 1). A single venous branch coursed medially, draining into the systemic circulation (►Fig. 2B), thus protective coil occlusion was performed with one 6 mm × 10 cm and one 8 mm × 20 interlock coils (Boston Scientific, Cork, Ireland) (►Fig. 2C).

The balloon occlusion retrograde venography was used to check the varices capacity and to delineate the anatomy of the pericolic collaterals and drainage pattern. Then, with the balloon inflated to achieve stasis and prevent reflux of sclerosant, using a microcatheter, 18 mL of mixture of (1:2:3, lipidol, 3% sodium tetradecyl sulfate [STS] and air) was infused slowly with aim of filling the entire varix (►Fig. 2D).

After waiting for 1 hour and 20 minutes, venogram, via the balloon catheter confirmed satisfactory embolization of the abnormal pericolic varices (►Fig. 2E). To reduce the balloon dwell time, multiple embolization coils including Azur (Terumo MicroVention, Saint-Germain-en-Laye, France) Tornado (Cook Medical, USA), Nester (Cook Medical, USA), and interlock coils (Boston Scientific, Cork, Ireland) were deployed through the occlusion balloon catheter prior to deflation^{4,5} (►Fig. 2F), which also help to reduce any reflux of sclerosant into the systemic circulation.

Following the procedure, the patient remained hemodynamically stable and had an uneventful post-procedure recovery. CTA 2 days later confirmed the occlusion of the varices with no signs of active bleeding (►Fig. 3).

Then, the patient was discharged and an outpatient follow-up 2 weeks later revealed no further episodes of gastrointestinal bleeding with stable hemoglobin level at 8.5 g/dL. Future management of the portal hypertension with either liver transplant or elective TIPS was considered.

Discussion

Ectopic varices are defined as dilated tortuous portosystemic collateral veins found in unusual locations other than the gastric and esophageal regions and constitute ~20% to 30% of variceal bleeding in patients with extrahepatic portal hypertension and up to 5% of those with intrahepatic portal hypertension.²

Colon varices are a very rare cause of lower gastrointestinal bleeding, with a reported incidence of 0.07%.⁶ Most cases of colonic varices are related to portal hypertension caused by underlying cirrhosis or portal vein obstruction.⁶ It forms ~3.5% of ectopic varices noticed in patients with portal hypertension.¹

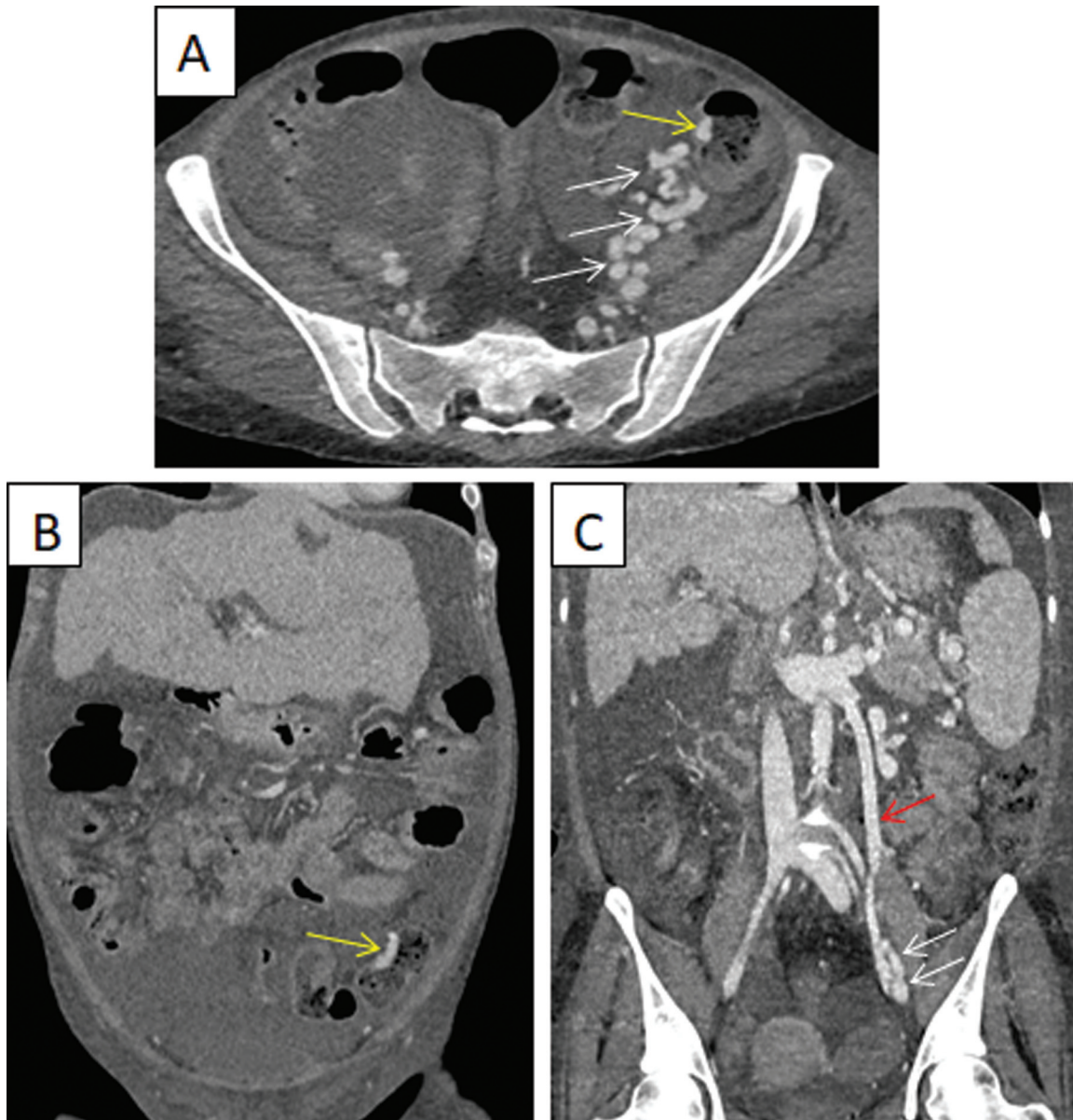


Fig. 1 Axial contrast-enhanced Abdominal CT scan (A) with coronal reformat (B and C) show multiple dilated tortuous vessels in the left iliac fossa around the distal descending colon (white arrows) and draining into the left ovarian vein, which is dilated (red arrow). Some of these vessels are seen extending to the submucosal plane of colon (yellow arrows). Signs of liver cirrhosis and severe ascites are also noted.

Initial medical management can be performed in these patients, which include resuscitation, correction of coagulopathy and antibiotics to prevent spontaneous bacterial peritonitis. The blood pressure can be maintained between 90 and 100 mmHg and heart rate less than 100 beats per minute. Vasoactive drugs such as vasopressin, terlipressin, or octreotide have been used for esophageal varices and gastric varices and may play a role in colonic varices.^{3,6}

Colonoscopy is considered the principal method for the diagnosis of colonic varices. However, with massive bleeding, the diagnostic rate of a colonoscopy is ~69% as the varices may be obscured by blood.⁶ Thereby, in case of massive bleeding, mesenteric angiography, abdominal CT and magnetic resonance imaging, are good alternative diagnostic tools.⁶

Management of colonic variceal bleeding has not been standardized yet. However, most cases with colonic variceal bleeding are associated with cirrhotic liver, which makes many cases inoperable due to underlying coagulopathy.^{6,7} Thus, less-invasive interventional therapies are tested depending on the underlying etiology and the distribution of the varices.⁷ These therapies include interventional radiologic procedures including transjugular intrahepatic portosystemic shunt (TIPS), BRTO, and coil embolization in addition to the endoscopic variceal ligation, and injection sclerotherapy.^{1,6,8} In our case, endoscopy failed to visualize to the varices. So, we used BRTO to occlude the problematic varices.

To our knowledge, we believe there are only three reported successful cases of use of BRTO for colonic varices.

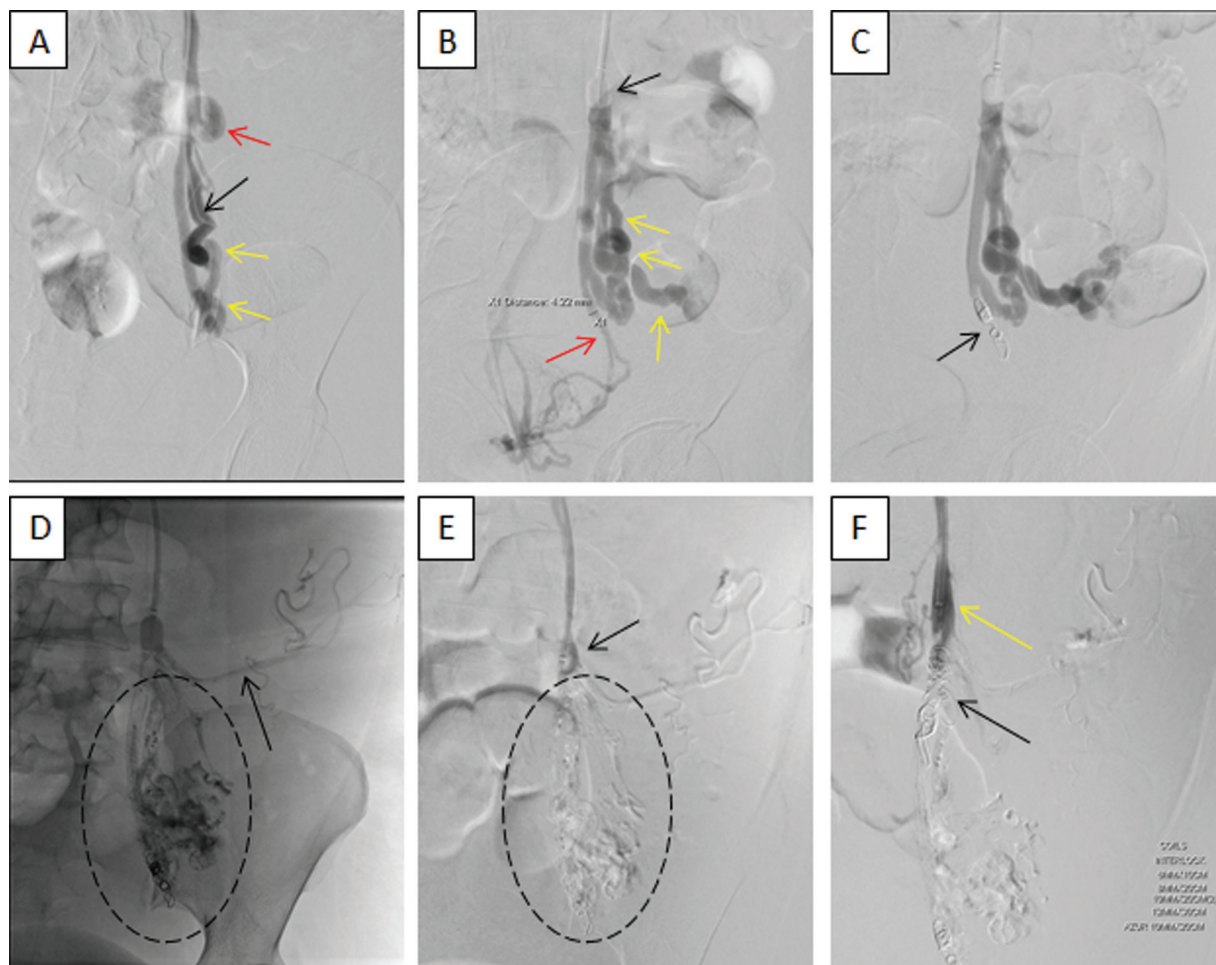


Fig. 2 BRTO. (A) Selective catheterization of the left ovarian vein using C1 catheter (black arrow) and retrograde venogram performed demonstrating outflow into the left renal vein. (B) C1 catheter has been exchanged for a balloon occlusion catheter, which has been inflated (black arrow) and retrograde venogram shows multiple tortuous pericolic varices around the descending colon (yellow arrows), one branch noted going deep medially into the pelvis draining into the systemic circulation (red arrow), (C) coil embolization of that pelvic vein to protect from sclerosant reflux (black arrow) (D) using a microcatheter inserted through the inflated balloon occlusion catheter, a sclerosant agent was infused slowly filling the entire varix (dashed circle). Single insignificant abdominal wall muscular venous branch (black arrow) was incidentally embolized. (E) Retrograde venogram via the inflated balloon catheter (black arrow) after waiting for 1 hour and 20 minutes showed no contrast filling the abnormal pericolic varices (dashed circle). (F) multiple coils (black arrow) were deployed at the end prior to slowly deflating the balloon catheter to reduce balloon dwell time. Final venogram performed via the deflated balloon catheter to confirm occlusion of the culprit varix (yellow arrow).

The first case was reported in 2006 by Anan et al.⁷ and described the successful use of BRTO for descending colonic varices via the left renal route for the treatment of hepatic encephalopathy. The second case was reported in 2018 by Matsumoto et al.¹ in which BRTO of the ascending colonic varices through the right testicular vein was performed as a preventive measure to decrease the risk of variceal bleeding.

In 2020, Liu et al.³ described the third successful case, in which the ascending colonic and hepatic flexure varices were obliterated through the right renal vein to stop the variceal bleeding.

Only little data are currently available on the use of the BRTO in the treatment of the colonic varices.³ However, its efficacy can be assumed from the published evidence of using this procedure in the treatment of other ectopic and gastric varices as alternative to TIPS or endoscopy as it showed comparative or sometimes even better results in terms of technical success rate, immediate hemostasis, im-

proving hepatic encephalopathy, re-bleeding rate, and overall survival.^{3,9}

In our case, we used a modified BRTO technique by using multiple embolization coils, which were deployed through a balloon catheter into the draining left ovarian vein prior to balloon deflation. This had two advantages^{4,5} including reducing the balloon dwell time and further preventing the reflux of sclerosant agent into the systemic circulation. This modified technique showed earlier success and effectiveness in treatment of gastric varices cases⁴ in addition to a case of ascending colonic varices drained via right renal vein.⁵ This modified BRTO technique is referred to as Coil-Assisted Retrograde Transvenous Obliteration II (CARTO-II).^{4,5}

The present patient is the fourth case reported to benefit from the treatment of colonic varices using BRTO. The long-term outcomes of using BRTO in patients with ectopic varices have not been clarified. Evidence from using BRTO in gastric varices shows new varices can form causing symptom

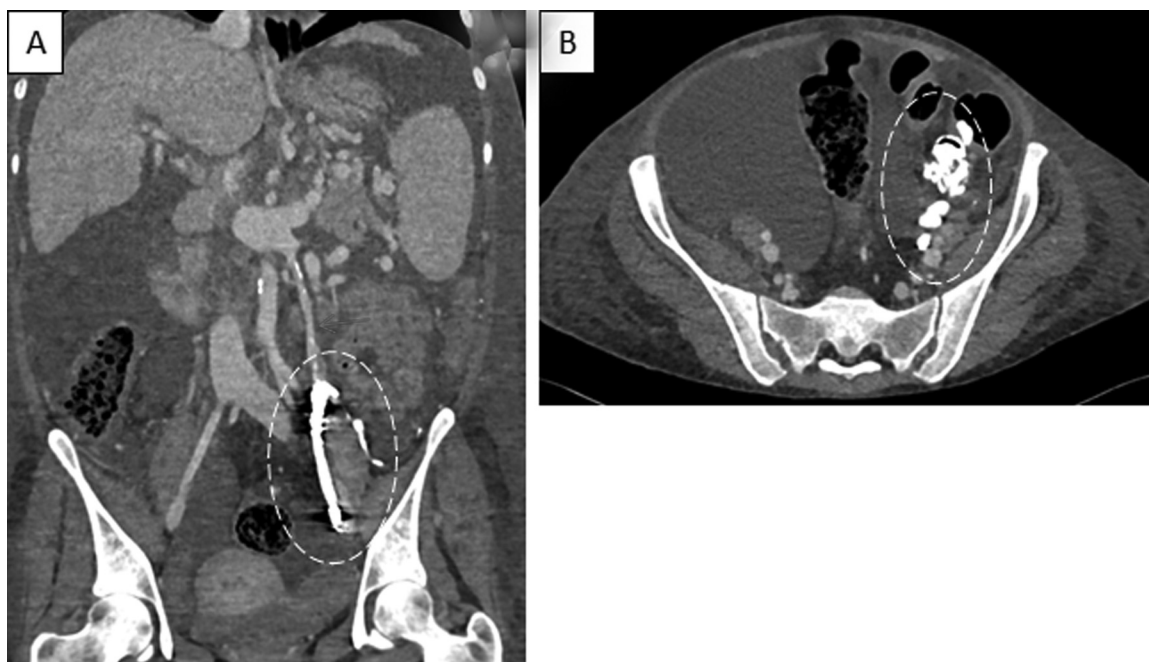


Fig. 3 Axial contrast-enhanced abdominal CT scan (B) with coronal reformation (A) show complete occlusion of multiple descending colonic varices (dashed circle). Normal diameter of left ovarian vein.

recurrence. Thus, follow-up by upper and lower endoscopy should be considered^{3,7,10}

Conclusion

The use of BRTO is beneficial in the management of colonic variceal hemorrhage especially when other alternatives fail, are contraindicated or technically difficult. However, further long-term multi-centric studies are required to identify its effectiveness and outcome. In addition, standardized management guidelines are required for colonic varices.

Ethical Approval

This case was approved by the Medical Research Centre in Qatar before submission.

Funding

None.

Conflict of Interest

None declared.

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