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Case Report

# Direct percutaneous embolization of superior rectal veins via an inferior mesenteric vein in a pediatric patient: A case report ☆,☆☆

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ABSTRACT

Portal hypertension is a frequent syndrome characterized by an increased portal pressure gradient. The relevance of portal hypertension derives from the frequency and severity of its complications. Rectal varicose is relatively common in portal hypertension patients with meager bleeding rates; However, rectal variceal bleeding is a complicated and sometimes life-threatening condition. The management of rectal variceal bleeding has yet to be adequately established. Endoscopy, surgery, or transjugular intrahepatic portosystemic shunt placement (TIPS) can be performed in patients with gastrointestinal bleeding secondary to portal hypertension due to different etiologies.

We present a successful case of direct abdominal percutaneous embolization of multiple and tortuous superior rectal varicose via the inferior mesenteric vein in a 7-year-old female patient with refractory rectal variceal bleeding, not susceptible to endoscopic, surgical, or TIPS management.



## Introduction

Portal hypertension is a frequent syndrome characterized by an increased portal pressure gradient (PPG); it becomes clinically significant and is associated with a risk of clinical complications, mostly when the PPG increases to 10 mm Hg or above [1]. The relevance of portal hypertension derives from the frequency and severity of its complications; these include the formation of esophageal or gastric vari-

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cose, variceal bleeding, and rectal varicose, among others [1].

Rectal varicose is relatively common in portal hypertension patients with meager bleeding rates [2]; However, rectal variceal bleeding is a complicated and sometimes life-threatening condition [3–5]. They exist between approximately 40%-55% of patients with cirrhosis and between 60%-90% of patients with extrahepatic portal vein hypertension [4]. Lower endoscopy is the main method for diagnosis; endoscopic color Doppler ultrasonography is better equipped than conventional endoscopic ultrasound to evaluate the hemodynamics of varicose [3,4].

The management of rectal variceal bleeding has yet to be adequately established [3]. Although endoscopic therapies, transjugular intrahepatic portosystemic shunt placement (TIPS), balloon occluded retrograde trans venous obliteration (BRTO), and surgical management are some therapeutic options for managing rectal varicose [2,3].

We present a successful case of direct abdominal percutaneous embolization of multiple and tortuous superior rectal varicose via the inferior mesenteric vein in a 7-year-old female patient with refractory rectal variceal bleeding, not susceptible to endoscopic, surgical, or TIPS management.

## Case report

We present the case of a 7-year-old female patient, the result of the second pregnancy on a 23-year-old mother with a history of pre-eclampsia, who gave birth at 36 weeks by C-section. The patient received management in the neonatal intensive care unit with umbilical catheterization due to a portal vein thrombosis diagnosis and was initially managed in another institution with a stent in the portal vein. Subsequently, stent thrombosis is documented, and a portal hypertension syndrome is diagnosed by cavernomatous transformation, hypertensive enteropathy, and the development of perigastric varicose veins and ectopic varicose veins affecting the perisplenic and rectal circulation.

Our patient presents multiple episodes of variceal gastrointestinal hemorrhage managed with esophageal and gastric devascularization, pyloroplasty, ligation of perigastric collateral vessels, sclerotherapy, and embolization of splenic collaterals with coils. The patient continued with refractory rectal variceal bleeding from which she developed anemia, managed with medical treatment with somatostatin analogs and endoscopic management with nonresponsive.

The patient case was discussed with the interdisciplinary board of hepatobiliary surgery, and transplants and endovascular management were defined. Initially, splenic embolization was proposed due to the splenomegaly secondary to the diagnosis of portal hypertension to reduce the pressure of the spleno-portal system. After analyzing the angiography computed tomography (angioCT) and Doppler ultrasonography of mesenteric vessels, it is decided by consensus to perform direct percutaneous embolization of superior rectal veins via an inferior mesenteric vein.

## Procedure description

Under general anesthesia, Doppler ultrasound is performed (Fig. 1), and computed tomography (CT) of the abdomen is analyzed, identifying a collateral vessel (inferior mesenteric vein) in the retroperitoneum with a tortuous course, flow, and vein wave pattern that is directed towards the rectal plexus where dilation and tortuosity of the varicose vascular package are visualized (Fig. 2). It was impossible to catheterize the varicose vein via the portal due to thrombosis and cavernomatous degeneration; neither was the splenic route due to previous splenic venous embolization.

Proceeded to direct percutaneous catheterization guided by ultrasound of the inferior mesenteric vein with a Chiba 22 G needle, micro guide 0.018 In is advanced. Vascular introducer 6 FR is passed on this micro guide, ensuring the access route. Hydrophilic guide 0.035 In is advanced; a catheter is passed charges 5 FR. Venography is performed by observing multiple dilated veins with perirectal varicose veins without active bleeding or thrombosis; the flow is inverted (retrograde). On a Cobra 5 French catheter, a 2.8 FR microcatheter is inserted, selectively catheterizing the right and left upper rectal varicose veins, and embolization is carried out with coils. In postembolization venography, an adequate decrease in flow to perirectal varicose veins is observed with normalizing anterograde flow to the mesenteric venous system. The outflow tract was embolized with coils and gel foam (Fig. 3).

After endovascular management, rectal bleeding is resolved, and progressive vasopressor dismantling is achieved.

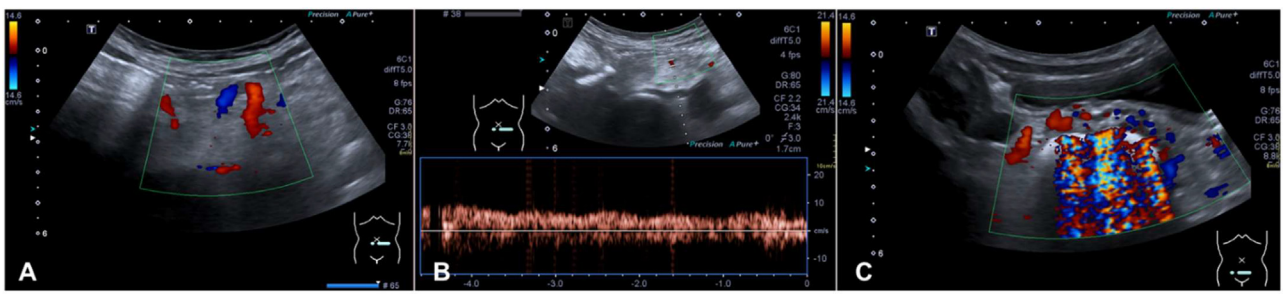


**Fig. 1 – Doppler ultrasound images in the transverse plane of the mesogastrium (A and B) and hypogastrium (C) in color and spectral Doppler mode show the tortuous and dilated inferior mesenteric vein communicating with the rectal venous plexus.**

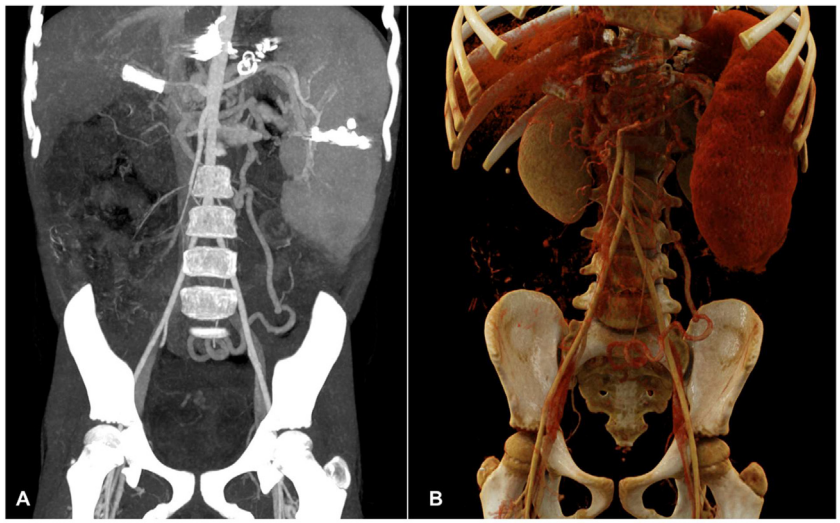


**Fig. 2 – Computed tomography (CT) images of the abdomen with coronal reconstruction in maximum pixel projection (A) and rendering volume (B) showing the dilated and tortuous inferior mesenteric vein.**

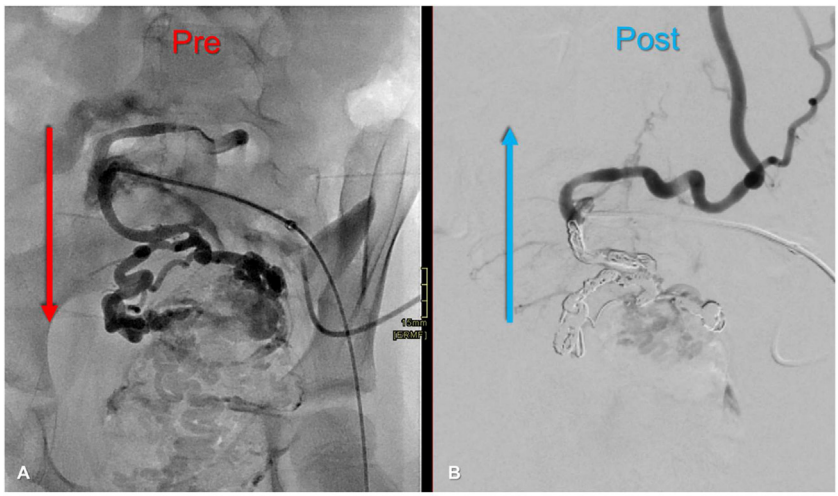


**Fig. 3 – Percutaneous angiography of the inferior mesenteric vein before (A) and after (B) embolization, observing satisfactory occlusion of rectal varicose and normalization of mesenteric venous flow.**

The patient is discharged after 48 hours without hospital admissions 12 months after embolization.

## Discussion

Portal hypertension is a frequent syndrome characterized by an increased PPG [1]. The relevance of portal hypertension derives from the frequency and severity of its complications; these include the formation of esophageal or gastric varicose, variceal bleeding, and rectal varicose, among others [1].

Rectal varicose is relatively common in portal hypertension patients with meager bleeding rates [2]; however, it is a complicated and sometimes life-threatening condition [3–5]. The management of rectal variceal bleeding has yet to be adequately established [3]. Endoscopy, surgery, or TIPS can be performed in patients with gastrointestinal bleeding secondary to portal hypertension due to different etiologies [2,3,6].

Managing portal hypertension-related bleeding requires a multidisciplinary approach involving hepatology, interventional radiology, surgery, and luminal and interventional gastroenterology [4,5]. In cases unsuitable for these treatment options, or where these failed to stop the bleeding, radiological percutaneous embolization of the portal vein collateral feeding the bleeding could be performed [6].

Percutaneous embolization of rectal varicose veins via endovascular is a technique that has been described and accepted for the refractory management of rectal variceal bleeding when medical or endoscopic treatment has failed or is

contraindicated. However, the permeability of the portal and the splenic system is required, a condition not present in our patient due to portal thrombosis.

Case reports in the literature are related to adult patients with portal hypertension secondary to cirrhosis. Some of them with percutaneous rectal embolization through the umbilical vein with success in managing variceal rectal bleeding [2]. Other reports show a successful percutaneous paraumbilical embolization of bleeding rectal varicose due to portal hypertension [6]. We found no case reports in pediatric patients reported in the literature.

This is the first case in our institution where percutaneous management is performed with the direct puncture of the inferior mesenteric vein and, subsequently, catheterization of the endovascular route in a pediatric patient with recurrent lower rectal bleeding secondary to portal hypertension.

## Conclusions

Percutaneous rectal varicose vein embolization for treating rectal variceal bleeding is used when standard medical or endoscopic management has failed or is contraindicated, with some case reports in the literature showing success meagering the symptoms. The present case illustrates the success of this technique in a pediatric patient, being the first performed in our institution and, so far, the only 1 in the bibliographic databases.

## Data sharing statement

The relevant anonymized patient-level data are available via request from the authors.

## Ethical approval and informed consent

The reported case was reviewed and approved, and individual patient consent was obtained following institutional guidelines. Following our institutional policies, all protected health information was removed.

## Patient consent

The reported case was reviewed and approved, and individual patient consent was obtained following institutional guidelines.

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