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Lower gastrointestinal hemorrhage in a case of mesenteric arteriovenous malformation with fistula: A case report from Vietnam

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ABSTRACT

Background: Gastrointestinal vascular malformations are rare and challenging-to-diagnose causes of gastrointestinal bleeding, accounting for 5% of non-variceal upper gastrointestinal hemorrhages. We describe a clinical case of a young female patient with superior mesenteric arteriovenous malformation accompanied by a fistula leading to severe gastrointestinal bleeding. Additionally, we review the literature on this condition and provide information about diagnostic tools and applicable treatment methods. *Case Presentation*: A 28-year-old female patient presented with a four-month history of hematochezia. She arrived at the emergency department of Binh Dan Hospital in a state of severe anemia. Esophagogastroduodenoscopy up to the first part of the duodenum and colonoscopy up to the cecum did not reveal signs of bleeding. A CT angiography of the abdomen identified a superior mesenteric arteriovenous malformation with active bleeding into the small intestine, suggesting the presence of a fistula from the malformed vessels. The surgical team performed an emergency laparotomy and resected a segment of the small intestine along with the mesentery containing the malformed vessels to control the bleeding source. *Conclusion*: This clinical case describes a rare condition of mesenteric arteriovenous malformation with a fistula causing severe gastrointestinal hemorrhage. It emphasizes the key clinical features, the critical role of CT angiography and endoscopy in achieving an accurate diagnosis, as well as appropriate surgical treatment methods.

Keywords: Mesenteric arteriovenous malformation, Arteriovenous fistula, Gastrointestinal hemorrhage.

1. INTRODUCTION

Arteriovenous malformations (AVMs) are a rare condition with limited documentation in the medical literature. They are most commonly found in the hepatic arteries (45%), splenic arteries (30%), gastroduodenal arteries, and the superior or inferior mesenteric arteries (Sreepriya et al., 2022). Etiologies include congenital malformations or secondary causes such as trauma, prior surgeries, or post-endovascular interventions (Shiraishi et al., 2022). Clinical presentations are diverse, ranging from abdominal pain, diarrhea, and hematochezia to complications of portal hypertension Upper and lower gastrointestinal (GI) endoscopy, combined with computed tomographic angiography (CTA), serves as an essential diagnostic tools. Currently, there is no standardized approach to AVM management; available options include image-guided vascular interventions, endoscopic procedures, or surgery (Shiraishi et al., 2022).

2. CASE PRESENTATION

A 28-year-old female patient arrived at the emergency department of Binh Dan Hospital in a state of severe anemia and a 4-month history of recurrent episodes of dark red hematochezia, she also reported having had a laparoscopic appendectomy 8 years ago. Upon admission, her vital signs were stable, but her pale skin and mucous membranes indicated a prolonged anemia condition. There were no signs of bleeding outside the gastrointestinal tract. Initial laboratory tests revealed severe anemia with hemoglobin levels at 6 g/dL. Both upper and lower gastrointestinal endoscopies were performed but failed to identify a bleeding source (Figure 1). Computed tomographic angiography (CTA) of the aortoiliac region showed arteriovenous malformations (AVMs) in the terminal branches of the superior mesenteric artery located in the mesentery and bowel wall of the left abdominal quadrant and hypogastric regions.

Figure 1 Reconstructed CT Angiography of the Aortoiliac arteries

The imaging also showed intraluminal blood within the small bowel loops in the left abdomen. The surgeon team diagnosed severe lower GI bleeding caused by superior mesenteric AVMs and decided on exploratory surgery. Intraoperatively, we identified two segments of the jejunum with scattered vascular malformations within the mesentery and bowel wall (Figure 2). Palpation of the affected areas revealed vascular bruits. The lumen exhibited slow oozing of blood, multiple aneurysms, and shallow ulcers. One aneurysmal site near the mesenteric border was ruptured, suggesting an arteriovenous fistula as the bleeding source. The surgical team opted to resect the involved small bowel segments and mesentery due to the high risk of recurrent bleeding if the malformations were left untreated.

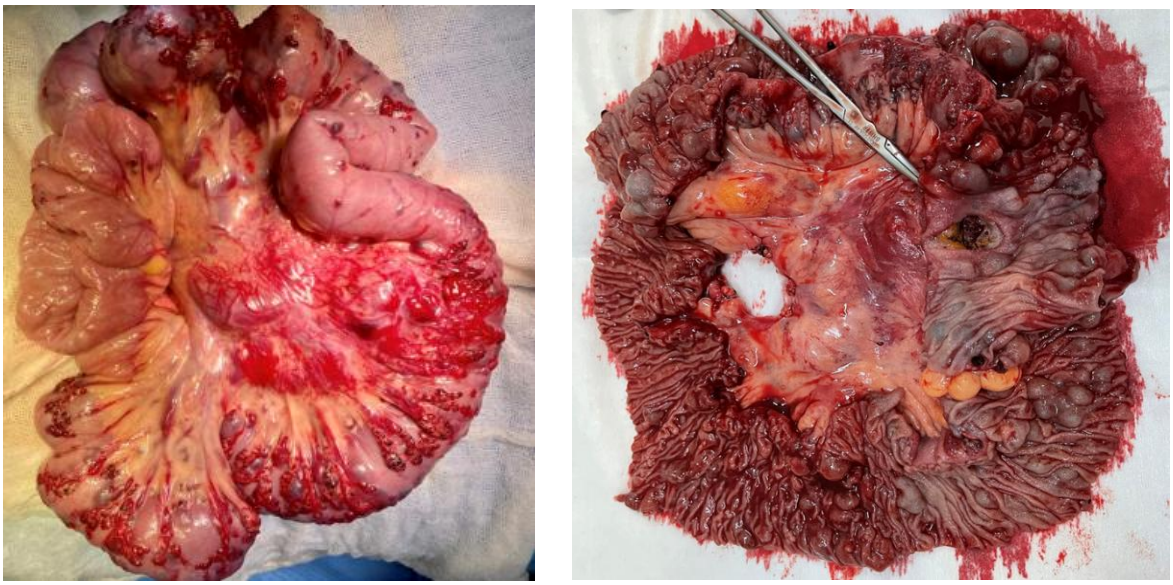

Figure 2 (Left) Jejunal segment showing vascular malformations scattered within the mesentery and bowel wall. (Right) AVM site with an arteriovenous fistula, actively bleeding into the intestinal lumen, causing gastrointestinal hemorrhage.

Approximately 120 cm of the small bowel was resected, leaving 230 cm of remaining intestine. We performed two end-to-end anastomoses: the proximal anastomosis 30 cm distal to the ligament of Treitz and the distal anastomosis 100 cm proximal to the ileocecal junction. The patient received total parenteral nutrition, blood transfusions, electrolyte replacement, and antibiotics. She resumed flatus on postoperative day 3, transitioned to oral intake on day 5, and was discharged on day 12 with anticoagulation therapy (vitamin K antagonists) due to thrombosis risk. Histopathology confirmed AVMs comprising large, dilated vessels without malignancy.

3. DISCUSSION

Arteriovenous malformations (AVMs) of the gastrointestinal tract are rare vascular anomalies. Reports indicate that AVMs are most commonly located in the vascular territories supplied by the hepatic artery (45%) and splenic artery (30%), with far fewer cases involving the superior mesenteric artery, inferior mesenteric artery, or gastroduodenal artery (Sreepriya et al., 2022). These malformations often present with recurrent gastrointestinal bleeding or are incidentally discovered (Trieu et al., 2023). Primary mesenteric AVM abnormalities may be congenital or idiopathic, distinct from secondary or acquired malformations caused by trauma, prior gastrointestinal surgery, or interventional vascular procedures (Shiraishi et al., 2022).

Based on Moore's classification system, which categorizes vascular malformations into three types using four diagnostic criteria Su et al., (2021), the described patient's AVM likely falls into Type 2, influenced by her history of laparoscopic appendectomy. Endoscopy and CT angiography are critical diagnostic modalities for AVMs (Trieu et al., 2023). CT angiography (CTA) has proven particularly valuable, with sensitivity, specificity, and positive predictive values of 70%, 100%, and 100%, respectively (Junquera et al., 2000). Combining diagnostic techniques is often necessary because AVMs may occur anywhere in the gastrointestinal tract (Shiraishi et al., 2022). In this case, the bleeding source cannot be detected by upper or lower gastrointestinal endoscopy. On the other side, CTA showed AVM-induced bleeding in the small bowel, a region difficult to access via standard endoscopy.

This emphasizes the necessity of CTA in diagnosing gastrointestinal bleeding of unknown cause, as well as guiding treatment methods through comprehensive vascular mapping. Endovascular approaches can control bleeding in up to 91% of cases involving diverticular or vascular disorders. Choosing the best course of treatment for gastrointestinal AVMs is difficult; the risk of recurrence if the bleeding source cannot be completely addressed with high rates of rebleeding (up to 50%) and complications, such as intestinal ischemia (13%) or bowel necrosis requiring surgery (5.2%), have been reported (Bua-Ngam et al., 2017). Endoscopic intervention has shown immediate success rates of up to 85%, with many patients achieving hemostasis and no need for transfusion. However, complications are more likely in lesions involving thin-walled regions such as the colon or submucosal AVMs (Su et al., 2021).

Open surgery remains a viable option, especially when other methods are infeasible, with success rates of 18–25% (Farrell and Friedman, 2005). In this case, the patient's AVMs included numerous tortuous small vessels along the small bowel and its mesentery, an actively bleeding lesion that was difficult to access endoscopically or through endovascular intervention warranted surgical exploration. Open surgery allowed for the precise identification and complete management of bleeding and vascular anomalies. Postoperative pathology findings included multiple aneurysms and thrombotic ulcers associated with AVMs along the small bowel and its mesentery with an area of inspected vessel-bowel fistula, all of which posed a high risk of recurrent bleeding if not achieved with adequate margin resection.

4. CONCLUSION

The clinical characteristics and treatment modalities for gastrointestinal arteriovenous malformations (AVMs) are demonstrated in this case study. It highlights the usefulness of diagnostic tools like CT angiography (CTA) even in a situation in which endoscopy cannot detect the bleeding site. Even while endovascular intervention works well in some situations, some drawbacks make traditional surgical methods necessary, as our case shows. The case contributes to the medical literature by describing a rare scenario of gastrointestinal AVMs. It emphasizes the significance of a multidisciplinary and individualized approach to diagnosing and treating this condition.

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We thank the participants who all contributed samples to the study.

Authors' Contribution

Duc M Tran had full access to all the data in the study and took responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Duc M Tran, Khanh G Cheng, Phuoc T Bui.

Drafting of the manuscript: Duc M Tran, Khanh G Cheng, Phuoc T Bui.

Ethical approval

Not applicable.

Informed consent

Written and Oral informed consent was obtained from participant included in the study.

Declaration

We hereby certify that this is the original research work of our team. All information presented in this report is truthful and has not been published in any other research project or publication.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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