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MULTIPLE SMALL BOWEL ARTERIOVENOUS MALFORMATION IN A 70 YEARS OLD MALE PRESENTING WITH RECURRENT GI BLEED AND SMALL BOWEL OBSTRUCTION IN MAYO UNIVERSITY HOSPITAL 2022- IRELAND

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ABSTRACT

The small intestine is the least common site of GI bleeding but is the commonest cause of obscure GI bleed Accounting for 5%- 10%. It is estimated that upper gastro-intestinal bleeding (UGIB) (from the oesophagus to duodenum), lower gastro-intestinal bleeding (LGIB) (from the colon and anorectum) and obscure bleeding account, respectively, for 50%, 40% and 10% of total GI bleeding.

CASE PRESENTATION

A 79 years old male who is Known case of Atrial fibrillation on rivaroxaban, COPD, CAD, Obstructive sleep apnea on CPAP. Had Recurrent admissions under medical team with frequent drop in Hb accompanied with small bowel obstruction. To the extent that he had multiple blood transfusions for that while the bowel obstruction was managed conservatively. On further questioning him about his recent admission he said that he would present with abdominal distension and Bleeding per rectum. He denied any family History of bleeding diathesis, or any cutaneous vascular diseases or Inflammatory bowel disease. No personal History of weight loss, recent abdominal procedures or any previous abdominal surgeries. On further questioning he said that he has no melena or hematemesis but only occasional PR Bleeding.

On Examination

During his obstruction attack he had Plain Abdominal radiograph that showed dilated small bowel loops and CT abdomen with IV and Oral contrast showed Small bowel dilatation with enlarged mesenteric nodes, Differentials include Lymphoma, tumor, fecalization or bleed, with no clear transition point can be clearly seen. The patient was be managed with transfusion for the low Hb as stated, NGT tube NPO and he will tend to resolve spontaneously in each admission.

He underwent afterwards Upper gastroscopy and that was normal. Then proceeded with Colonoscopy that showed Erosion in the terminal ileum so it was biopsied and came back as non-specific inflammation but not classic to any of the IBD categories. So the next differential in mind is OGIB so he was sent for Double Balloon Endoscopy that showed Diffuse enteritis with friable mucosa till reaching a point of normal mucosa with the impression of ischemic enteritis but less likely lymphoma or IBD. So multiple biopsies were taken that showed acute jejunitis with non-specific features. Reaching to that stage with no clear reason for the disgnosis led us to proceed with CT Angiography and that showed Prominent mesenteric nodes with Slight whirling of the vascular structures in midabdomen at SMA branches. The patient serum lactate remained normal the whole time. So the differentials for recurrant Bowel obstruction with OGIB were small bowel tumor, ischemic enteritis from the rotated SMA and small bowel vascular malformation.

Patient was counselled in regards to his condition and all possibilities and was assessed by anaesthesia. He underwent Exploratory laparotomy in September 2023 that showed Non significant dilated small bowel with Multiple serosal dark melanotic like spots in different sizes from the jujenum to the terminal ileum. The biggest that sizing 1x2 cm and was at the transition spot between the proximally dilated loops and distally collapsed loops of bowel, so that segment was resected and side to side primary anastomosis was done. The rest of the abdominal organ were insepected and were normal. Post operatively he went into ileus for around three weeks. So he was kept on TPN, NGT. CT abdomen with IV and oral contrast will show postoperative adhesional obstruction.

His histopathological sample came back as Arteriovenous malformation formley named angiodysplasia of the small bowel mucosa associated with intramucosal hemorrage. So having that in mind can explains the presence of these multiple malformations and given that the patient was on anticoagulation for his Afib so this can explain that these lesion to bleed

intramurally and increase in size to an extent that will cause this small bowel obstruction.

Image 1: The biggest melanotic like small bowel lesion at the Tranzition zone.

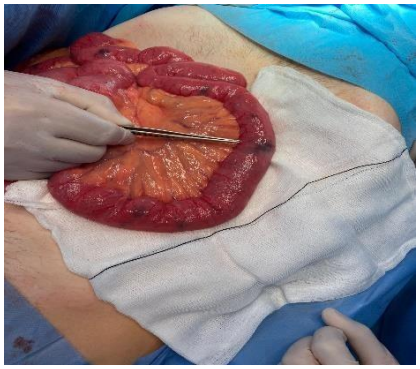

Image 2: Other similar melanotic like lesions scattered in the rest of the small bowel but smaller in size.

As a result we explained to the patient the risk and benefit of being on the anticoagulation. In cooperation with the medical team we both agreed that the patient has to be off his anticoagulation and switched only to prophylactic clexane. Since afterwards his NGT output reduced gradually and he started to open his bowel till his obstruction resolved completely. Has been following in the surgical outpatient department and was in satisfactory state.

DISCUSSION

Obscure Gastrointestinal Bleeding (OGIB) Is defined as bleeding from an unidentified origin that persists despite a comprehensive upper and lower GI evaluation. Sometimes risk of missed lesions in Upper or lower scope testing can be a possibility as well. Having that said small bowel account for 5% of all GI bleeding, representing the most common source of Obscure GI bleeding.[1,3] In the small bowel, 20 to 30% of bleeding cases are caused by abnormal blood vessels, including angioectasias, AVMs, hemangiomas, and Dieulafoy's lesions.[4,6]

Small Bowel bleeding can present in various ways including hematochazia, Melena, Iron definecy anemia and positive Fecal occult blood. And the challenge lies in the difficulty accessing the small bowel to diagnose, Localize and treat the cause of the bleed. Having that said, patients with a small bowel GI bleed usually end up undergoing multiple diagnostic investigations, requiring multiple hospitalisations and transfusions; therefore, it is necessary to identify the cause and site of haemorrhage accurately, so as to institute appropriate, effective therapy.

Arteriovenous malformations (AVMs) are an important vascular cause of small-bowel bleeding. However, it is often difficult to diagnose and treat AVMs of the small-bowel. Furthermore, it is challenging to determine the optimal surgical margin of the lesions when there are multiple lesions.

Angiodysplasia is the common name for the vascular malformations in the small bowel and that contribute to most causes of the OGIB. (AD) is characterized by the focal accumulation of abnormal, dilated and tortuous blood vessels visualized within the mucosal and submucosal layers of the gut.

The term AD sometimes includes a variety of synonymous disease concepts, such as angioectasia (AE), Dieulafoy's lesion (DL) and arteriovenous malformation (AVM), careful attention is needed when interpreting those lesions because the differences have not been fully addressed in previous reports. Small bowel vascular lesions are can be endoscopically classified into four categories based on the Yano-Yamamoto classification.[7-8] (Illustrated in Table 1 below)

Table 1: Endoscopic Classification of small bowel vascular lesions based on Yano-Yamamoto Classification.[7]

Label	Yano-Yamamoto Class	Endoscopic Evaluation		Histopathologic Evaluation
	Type 1a	Punctate (< 1mm)	Small Erythematouss	consist of thin, dilated and tortuous veins that lack a smooth muscle layer, explaining their weakness and tendency to bleed
	Type 1b	Patchy (few mm)		
Dielfory Lesion	Type 2a	Punctae lesion with pulsatile Bleeding		
	Type 2b	Pulsitile red protrusion without surrounding venous dilatation		
AVM	Type 3	Pulsatile red protrusions with surrounding venous dilatation		Abbarent Blood vessels with thickened,

				Hypertrophied walls that varies in thickness greatly and characterized by direct connections of the arteries and viens without any capillaries.
	Type 4: congenital intestinal AVMs are relatively large and	sometimes appear as a mass or polypoid lesion, which can be classified Lesions not classified into any of the above categories		

And according to Moore's classification, intestinal AVMs can be classified into three categories.[7]

- Type 1- AVMs are an acquired disease, occurring mainly in elderly patients and frequently appearing in the right colon and it is usually acquired and according to Boley et al that suggested mechanical theory as the proposed pathogenesis for the development of the Aquired AVM. So he suggested that increased bowel wall pressures and chronic hypoxia can induce the partial obstruction of submucosal veins, leading to capillary congestion, failure of the pre-capillary sphincters, and eventually the formation of permanent malformation.[9]
- Type 2- AVMs are considered to be a congenital disease, occurring in younger patients and typically appearing in the small bowel.
- Type 3- AVMs present as GI involvement in patients with hereditary hemorrhagic telangiectasia. Type 1 AVMs, which are considered to be an acquired disease, are predominantly located in the right colon, where the bowel tension is relatively high, suggesting that AVMs might also develop through "mechanical theory", similar to AEs.

Other proposed theory is the angiogenic theory. As Junquera et al reported the importance of angiogenic factors for the formation of the vascular malformation. And they have proved that VEGF (Vascular Endothelial Growth Factor) a mediator in early angiogenesis, was high in patient with the vascular malforatmation. As with chronic or intermittent ischemia there will be imbalance between proangiogenic and antiangiogenic factors, hence pathological vascular malformations will arise.[10]

Obscure GIB is very challenging as the source of the bleeding is unidentified with Initial scopes. So when the suspicion is high that the bleeding could be from the small bowel then

the rate of the bleeding and the hemodynamic instability will be our next attraction to decide about the next modality to investigate with. In other words, if the rate of Bleed is > 0.5 ml/min Mesenteric angiography will be the choice, While if it was > 0.3 ml/min then CT angiogram will be helpful and when its > 0.1 ml/min RBC scan will be the modality of choice.[8]

Challenges to diagnose and treat AVM

In general, AVMs in the small bowel have been described as submucosal uplift accompanied by redness, vascular proliferation, and vascular ectasia. However, most of them are findings in intraoperative endoscopy, and there are a limited number of cases diagnosed by preoperative endoscopy in the absence of active bleeding.[11,12]

AVMs in the small bowel that could be diagnosed by preoperative DBE, and the pulsatile submucosal uplift accompanied by a small red patch on the top might be an important finding that indicates AVMs.[13]

On the other hand, the biggest challenge is it is difficult to identify all the lesions by endoscopy in cases where multiple AVMs exist in the small bowel. And that was the case with our patient. Having that said yet the optimal diagnosis and treatment strategy for multiple AVMs of the small bowel have not been fully elucidated. It was hypothetazied that segmental bowel resction and anastomosis with small resction margin was the modality of choice to treat Small bowel AVM to retain Small bowel function. However, it is exceedingly challenging to identify the location of lesions and determine the optimal surgical margin, especially in cases where there are multiple AVMs in the small bowel. A technique combining selective angiography with intraoperative localization of the sites of the Obscure bleed.[14,17] It has been reported that 5–37% of patients who underwent resection of AVMs will rebleed and one of the causes is incomplete excision. The series of methods and techniques that we report here will contribute to the clinical treatment of AVMs of the small bowel.[18,19]

CONCLUSION

In Conclusion AVM of the small bowel is very challenging to diagnose as it is considered one of the causes of OGIB and what makes it more complicated when they are multiple especially in localizing the sites of the bleeds to remove it. Yet no enough cases were reported to exactly report the best way to treat multiple small bowel AVM.

REFERENCES

1. Lewis BS. Small intestinal bleeding. Gastroenterol Clin North Am., 1994; 23: 67-91 [PMID: 8132301 DOI: 10.1016/S0889-8553(05)70108-4].
2. Longstreth G. F. Epidemiology and outcome of patients hospitalized with acute lower gastrointestinal hemorrhage: a population-based study. *The American Journal of Gastroenterology*, 1997; 92(3): 419–424.
3. Katz L. B. The role of surgery in occult gastrointestinal bleeding. *Seminars in Gastrointestinal Disease*, 1999; 10(2): 78–81.
4. Sun B., Rajan E., Cheng S., et al. Diagnostic yield and therapeutic impact of double-balloon enteroscopy in a large cohort of patients with obscure gastrointestinal bleeding. *The American Journal of Gastroenterology*, 2006; 101(9): 2011–2015. doi: 10.1111/j.1572- 0241.2006.00664.x.
5. Ohmiya N., Yano T., Yamamoto H., et al. Diagnosis and treatment of obscure GI bleeding at double balloon endoscopy. *Gastrointestinal Endoscopy*, 2007; 66(3): S72–S77. doi: 10.1016/j.gie.2007.05.041.
6. Pasha S. F., Leighton J. A., Das A., et al. Double-balloon enteroscopy and capsule endoscopy have comparable diagnostic yield in small-bowel disease: a meta-analysis. *Clinical Gastroenterology and Hepatology*, 2008; 6(6): 671–676. doi: 10.1016/j.cgh.2008.01.005.
7. Yano T, Yamamoto H, Sunada K, Miyata T, Iwamoto M, Hayashi Y, Arashiro M, Sugano K. Endoscopic classification of vascular lesions of the small intestine (with videos). Gastrointest Endosc., 2008; 67: 169-172 [PMID: 18155439 DOI: 10.1016/j.gie.2007.08.005].
8. Eiji Sakai, Ken Ohata, Atsushi Nakajima, Nobuyuki Matsuhashi. Diagnosis and therapeutic strategies for small bowel vascular lesions. World J Gastroenterol, 2019 June 14; 25(22): 2720-2733. DOI: 10.3748/wjg.v25.i22.2720.
9. Boley SJ, Sammartano R, Adams A, DiBiase A, Kleinhaus S, Sprayregen S. On the nature and etiology of vascular ectasias of the colon. Degenerative lesions of aging. Gastroenterology, 1977; 72: 650-660 [PMID: 300063].
10. Junquera F, Saperas E, de Torres I, Vidal MT, Malagelada JR. Increased expression of angiogenic factors in human colonic angiodysplasia. Am J Gastroenterol, 1999; 94: 1070–1076.
11. Fujii T., Morita H., Sutoh T., Takada T., Tsutsumi S., Kuwano H. Arteriovenous malformation detected by small bowel endoscopy. *Case Reports in Gastroenterology*.

2014; 8(2): 324–328. doi: 10.1159/000367591.

12. Miyasako Y., Kuwai T., Ishaq S. A case of a small intestinal arteriovenous malformation diagnosed by double-balloon enteroscopy preoperatively. *Digestive Endoscopy*, 2019; 31(3): e68–e69. doi: 10.1111/den.13357.
13. M Hirakawa, R Ishizuka, M Sato, N Hayasaka, H Ohnuma, K Murase, K Takada, T Ito, T Nobuoka, K Miyanishi, M Kobune, I Takemasa, and J Kato. Management of Multiple Arteriovenous Malformations of the Small Bowel. Case Rep Med., 2019; 2019: 2046857. PMID: 31885600.
14. Athanasoulis C. A., Moncure A. C., Greenfield A. J., et al. Intraoperative localization of small bowel bleeding sites with combined use of angiographic methods and methylene blue injection. Surgery, 1980; 87(1): 77–84.
15. Gifford S. M., Peck M. A., Reyes A. M., Lundy J. B. Methylene blue enteric mapping for intraoperative localization in obscure small bowel hemorrhage: report of a new technique and literature review: combined intraoperative methylene blue mapping and enterectomy. Journal of Gastrointestinal Surgery, 2012; 16(11): 2177–2181. doi: 10.1007/s11605-012-1964-9.
16. Frydman J., Bahouth H., Leiderman M., Ofer A., Kluger Y. Methylene blue injection via superior mesenteric artery microcatheter for focused enterectomy in the treatment of a bleeding small intestinal arteriovenous malformation. World Journal of Emergency Surgery, 2014; 9(1): 17. doi: 10.1186/1749-7922-9-17.
17. Masahiro H, Rie I, Masanori S, Naotaka H, Hiroyuki O, Kazuyuki M, Kohichi T, Tatsuya I, Takayuki N, Koji M, Masayoshi K, Ichiro T, Junji K. Management of Multiple Asteriovenous Malformation of the Small Bowel. Case Reports in Medicine, 2019: 2046857.
18. C. T. Meyer, F. J. Troncale, S. Galloway, and D. G. Sheahan, "Arteriovenous malformations of the bowel: an analysis of 22 cases and a review of the literature," Medicine, 1981; 60(1): 36–48.
19. J. D. Richardson, M. H. Max, L. M. Flint et al., "Bleeding vascular malformations of the intestine," Surgery, 1978; 84(3): 430–436.