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Case report

A rare case of bleeding jejunal ulcer diagnosed by intraoperative use of enteroscopy

Filagot Mikru [a], Ayenew Gucho [b,*], Jiksa Muleta [a], Ermias Tilahun [a], Kalkidan Haile [a], Eden Belayneh [a]

[a] Myungsung Christian Medical Center, Ethiopia
[b] Soddo Christian Hospital, Ethiopia

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ABSTRACT

Introduction: Small bowel bleeding can be overt or occult. Despite advances in imaging and endoscopy, the diagnosis and treatment of small bowel bleeding remain challenging due to its length and location. Diagnostic procedures such as push enteroscopy, capsule endoscopy and intraoperative enteroscopy are recommended to identify the source of bleeding.

Case presentation: A 33-year-old female with no prior history of bleeding diathesis presented with massive lower GI bleeding. Although she was in hypovolemic shock from bleeding, physical exam, splanchnic angiography and colonoscopy were unable to localize the source of bleeding. The patient continued to bleed and deteriorate despite transfusions. Exploratory laparotomy was done but localizing the source with manual palpation of small bowel was difficult. Intraoperative enteroscopy was done and showed a 2 by 1 cm ulcerative lesion at mid jejunum. Part of jejunum containing the ulcer was resected and anastomosis done. The patient did well post-operatively and on follow up.

Clinical discussion: A bleeding primary jejunal ulcer is rare clinical scenario difficult to diagnose. Intraoperative enteroscopy is useful in cases where initial diagnostic workups are inconclusive. It can be performed using various types of endoscopes, such as a standard or pediatric colonoscope, push enteroscope, or a sonde enteroscope, during laparotomy.

Conclusion: Primary jejunal ulcer is a rare cause of massive lower GI bleeding. Although minimally invasive deep endoscopic techniques to diagnose small bowel ulcers are evolving, intraoperative enteroscopy remains to be technically easy and helpful tool to make a diagnosis and guide intervention especially in a patient undergoing laparotomy for bleeding small bowel ulcer.

1. Introduction

Amongst gastrointestinal bleeding, 40 % are due to lower GI tract bleeds, and about 5 % to 10 % are due to lesions in the small bowel [1]. Lower gastrointestinal bleeding (LGIB) is a common condition that leads to hospital admissions associated with significant morbidity and mortality. LGIB remains a frequent cause of hospitalizations, and diagnostic and therapeutic strategies include colonoscopy, scintigraphy, angiography, and surgery [3]. In the UK, LGIB represents approximately 3 % of all surgical referrals to the hospital, and conservative management is often successful, with colonoscopy being the first-line investigation and treatment [4]. The major causes of LGIB are diverticulosis, vascular malformations, and cancer, with the colon being the most common location of bleeding [5].

Part of small bowel between the ligament of Treitz and the ileocecal valve presents with obscure GI bleeding [9]. Despite advances in imaging and endoscopy, the diagnosis and treatment of small bowel bleeding remains challenging. The small bowel is difficult to evaluate due to its length and location, making it hard to detect causes of bleeding [10]. Common causes of small bowel bleeding include vascular ectasia, tumors, ulcerative diseases, and Meckel's diverticula. Primary small bowel ulcer presenting with lower GI bleeding is reported to be a rare

Abbreviations: LGIB, Lower Gastrointestinal Bleeding; VCE, Video Capsule Endoscopy; IOE, Intraoperative Enteroscopy; DAE, Device- Assisted Enteroscopy; SBP, Systolic blood pressure; EGD, Esophagogastroduodenoscopy; ICU, Intensive Care Unit.

* Corresponding author at: PO Box 305, Soddo Christian Hospital, Department of General Surgery, Ethiopia.
E-mail address: ayenewimpact68@gmail.com (A. Gucho).

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clinical scenario [20,21]. Diagnostic procedures such as push enteroscopy, capsule endoscopy and intraoperative enteroscopy are recommended to identify the source of bleeding [11]. Treatment options depend on specific cause and patient presentation. Interventions including endoscopic therapy, surgical excision or resection, and invasive radiological methods. Medical therapy with iron supplementation and avoidance of ulcerogenic drugs may be considered for patients who are not candidates for other treatments [10]. Here we present a case of bleeding jejunal ulcer diagnosed with use of intraoperative enteroscopy. This work has been reported in line with SCARE criteria [23].

Case presentation.

A 33 years old woman from middle socioeconomic background came to emergency department complaining of rectal bleeding which started 10 h prior to presentation. The bleeding was massive and mostly dark red with some bright red component. She gave associated history of syncope, palpitations, fatigue and vomiting. Otherwise, she has no hematemesis, no abdominal pain and no previous similar illness. She has regular periods and the last one was 10 days ago. She was not on drugs like NSAIDS or anticoagulants. The patient has no history of bleeding diathesis or other known medical problems.

On physical exam, she was acutely sick in hemorrhagic shock with pulse rate 130 bpm and blood pressure 90/55 mmHg. Systemic exam was unremarkable except for pallor and blood on rectal exam which didn't reveal rectal mass or bleeding hemorrhoids. Her CBC showed Hgb of 7.1 and PLT 273,000. Coagulation profile, liver and renal functions were normal. After transfusion with 2 units of packed RBC, emergent upper GI endoscopy and colonoscopy were done. Endoscopy was normal and the entire colon was filled by blood on colonoscopy but no bleeding source visualized after wash. Superior mesenteric artery and inferior mesenteric artery angiography was also done and showed wall enhancement at proximal jejunum but didn't show contrast extravasation [Fig. 1].

The patient was transferred to ICU after investigations and transfused with 4 units of packed RBC, 4 units of platelets and 3 units of fresh frozen plasma. Despite transfusions, her pulse increased to 150 s and SBP dropped to 80s. At this point, exploratory laparotomy was decided and done urgently. Laparotomy was done midline under general anesthesia. During exploration, small bowel starting from mid jejunum and colon were filled by clotted blood but no discrete mass was identified on manual palpation. To identify source of bleeding, intraoperative enteroscopy was done by making small enterostomy on proximal jejunum for scope entry [Fig. 2]. After washing bloody content in the

Fig. 2. Intraop enteroscopy after irrigating clots.

small bowel, entire length of jejunum and ileum were carefully examined and 2 cm by 1 cm bleeding ulcerated lesion was visualized in mid jejunum about 60 cm from ligament of Treitz and it was marked by stitch externally [Fig. 3]. Segmental resection of about 8 cm mid jejunum containing the ulcer was done and sent for pathology followed by hand sewn side-to-side anastomosis and closure of enterotomy site. The procedure took 2 h and there was no technical difficulty. Postoperatively, she had dark lower GI bleeding as well as hematemesis but postop EGD was unremarkable and the bleeding was explained by passage of already existing clots in the GI tract [Fig. 4].

After smooth postoperative days in ICU, the patient continued to improve hemodynamically. She was transferred to the floor for observation and discharged on day 10. Pathology showed ulcer eroded jejunal

Fig. 1. Splanchnic angiography.

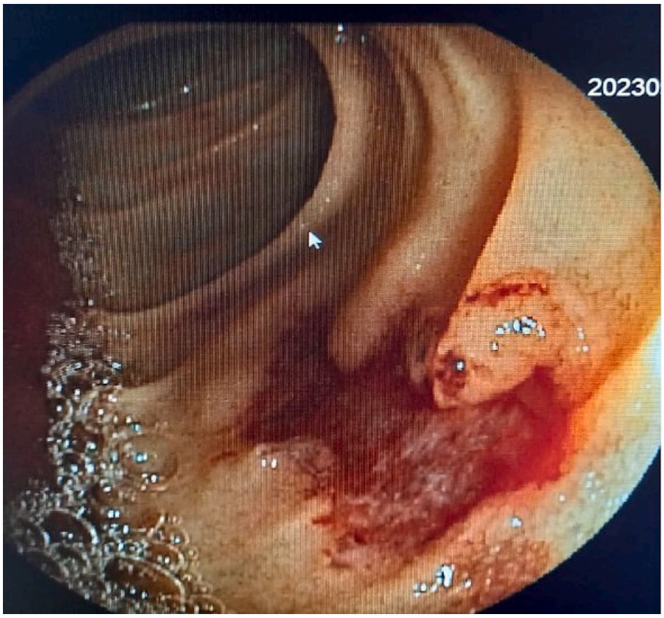

Fig. 3. Jejunal ulcer.

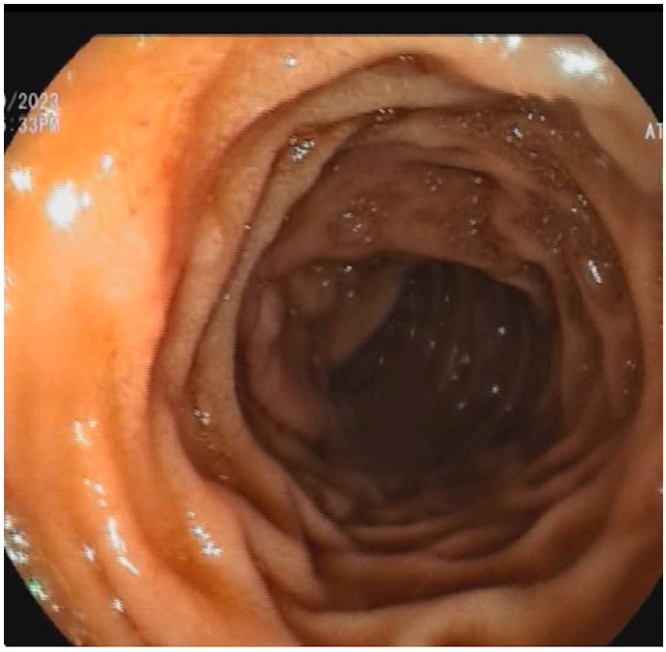

Fig. 4. Postoperative unremarkable EGD.

surface involving mucosa, submucosa and muscularis layers with intense inflammation and engorged vessels with otherwise no features of malignancy. On her outpatient follow up after 2 weeks and then 4 weeks, the patient continued to do well with no history of bleeding and improved symptoms of anemia. Her follow up CBC and coagulation profile are within normal ranges.

2. Discussion

Nonspecific small bowel ulcer is a rare disease. A reported incidence is approximately 4 small bowel ulcerations per 100,000 individuals. From these individuals, only 15 % ulcers were in the jejunum [20,21]. The etiology of primary jejunal ulcer has not been fully established and many theories have been presented including ectopic gastric mucosa, vascular spasm, endarteritis, arteriosclerosis or embolization", acid-peptic theory like in zollinger-ellison syndrome were the main ones [22]. Some ulcers, however, are unexplainable by any specific mechanism and have been termed "nonspecific" or "idiopathic" or "Primary" small bowel ulcers. Complications resulting from nonspecific small bowel ulcers have been reported previously, including intermittent small bowel obstruction, blood loss and acute abdomen [20,21]. If one is fortunate in establishing the diagnosis of primary jejunal ulcer early resection of a segment of small bowel and primary end-to-end or side-to-side anastomosis should be performed [20,22].

Intraoperative enteroscopy is a diagnostic and therapeutic procedure used to assess and treat small bowel bleeds. It is particularly useful in cases where initial diagnostic workups are inconclusive and current technology limitations hinder accurate assessment [12]. On-table intraoperative enteroscopy is an easily available diagnostic modality that can be performed by general surgeons themselves with accuracy rates comparable to or better than newer diagnostic modalities [12–14]. It can be performed using various types of endoscopes, such as a standard or pediatric colonoscope, push enteroscope, or a sonde enteroscope, during laparotomy [15]. The procedure has several indications, including detecting otherwise occult lesions, defining the location of multiple small lesions, confirming bleeding from known lesions, excluding the presence of suspected bleeding lesions, and aiding in determining the length of required resection [16]. Before the advent of video capsule endoscopy (VCE), intraoperative enteroscopy (IOE) was the only technique available for complete small intestine exploration, with a high success rate in reaching the end of the ileum but also associated with a mortality rate of 4 % and high morbidity due to post-surgical ileus caused by intraoperative mesentery stretching [18].In the post-video capsule endoscopy (VCE) and device-assisted enteroscopy (DAE) era, intraoperative enteroscopy remains essential in evaluating small bowel disorders, detecting new lesions, and guiding therapy in carefully selected patients [18]. IOE remains useful for exact localization of small-bowel lesions and for performing endoscopic or surgical treatment. The rebleeding rate in IOE exploration for obscure GI bleeding can be as high as 30 % [18,19].

Less invasive deep enteroscopic techniques like push enteroscopy, single and double balloon enteroscopy are alternatives when technically feasible. The drawback with balloon enteroscopies is that it exposes patients to substantial radiation(fluoroscopy), takes longer time and often requires laparoscopic assistance making its utilization limited in urgent situations. Novel motorized power spiral enteroscopy is a great tool in small-bowel diagnostics and therapeutics due to its speed and technical ease [24].

In this particular case, although the bleeding was massive, localization of its source was difficult based on clinical exam, imaging studies and colonoscopy. The fact that endoscopy and colonoscopy were negative on the face of massive bleeding was indicative of small bowel being the source. But finding no palpable mass lesion in the small bowel during exploration added more diagnostic uncertainty which was resolved by intraoperative use of enteroscopy.

3. Conclusion

Primary jejunal ulcer is a rare cause of massive lower GI bleeding. Although minimally invasive deep endoscopic techniques to diagnose small bowel ulcers are evolving, intraoperative enteroscopy remains to be technically easy and helpful tool to make a diagnosis and guide intervention especially in a patient undergoing laparotomy for bleeding small bowel ulcer.

Consent

Written informed consent in a local language was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Ethical approval

Ethical approval was provided by the author's institution.

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Author contribution

1. Filagot Mikru,MD, attending General Surgeon: Operated on the patient as leading surgeon, reviewed the case report.
2. Dr.Jiksa Muleta, MD, gastroenterologist: Did intraoperative enteroscopy.
3. Ayenew Gucho, MD, General Surgery resident: writing and organizing the case report, involved in patient management.
4. Ermiyas Tadesse, MD, General Surgery resident: collecting patient information and images, writing the case report and management of the patient.
5. Eden Belayneh, MD, internal medicine resident: involved in patient management.
6. Kalkidan Haile, MD, internal medicine resident: involved in patient management.

Guarantor

Filagot Mikru, MD.

Declaration of competing interest

The authors declare no conflicts of interest.

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