



# APPENDICEAL BLEEDING, A RARE YET IMPORTANT CAUSE OF LOWER GASTROINTESTINAL BLEED

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## ABSTRACT

**Background:** Lower gastrointestinal bleeding accounts for 20 to 25% of all gastrointestinal bleedings. Appendiceal bleeding is a rare, yet important cause of lower gastrointestinal bleed; in many cases, it can be misdiagnosed as obscure gastrointestinal bleeding. Here, we present a case of appendiceal bleeding in an elderly female.

**Case description:** A 79-year-old female presented with acute onset of gastrointestinal bleeding of same-day duration. Investigations showed that she had an appendiceal bleed originating from an ulcer secondary to a small appendicolith, which has passed through the appendiceal orifice, combined with her aspirin use. Within 12 hours, a laparoscopic appendectomy was performed. No evidence of malignancy or vascular malformation was detected, and the post-operative course was smooth, with resultant discharge at day 3 after her surgery.

**Discussion:** For lower gastrointestinal bleeding, it is crucial for the endoscopist to reach the terminal ileum during the colonoscopy, and thoroughly inspect the orifice of the appendix to assess any source of bleed including but not limited to Dieulafoy's lesion, angiodysplasia or any vascular malformation. An effective treatment option for appendiceal bleeding is surgical management with appendectomy. Alternative approaches such as vessel embolization and endoscopic treatment have been reported to successfully control bleeding; nevertheless, the risk of acute appendicitis and recurrent bleeding following these procedures can be challenging to manage, potentially leading the patient to still need a surgical treatment with an appendectomy.

## KEYWORDS

| Appendix, gastrointestinal bleed, bleeding, appendiceal bleeding

## LEARNING POINTS

- Appendiceal bleeding is a rare, yet important cause of lower gastrointestinal bleed; in many cases, it can be misdiagnosed as obscure gastrointestinal bleeding.



## INTRODUCTION

Lower gastrointestinal bleeding accounts for 20 to 25% of all gastrointestinal bleeding<sup>[1]</sup>; it can typically present as haematochezia or melena. Aetiologies can vary, while the source of bleeding cannot be identified in approximately 10% of patients. Appendiceal bleeding is a rare, yet important cause of lower gastrointestinal bleeding. In many cases, it can be misdiagnosed as obscure gastrointestinal bleeding. Here, we present a case of appendiceal bleeding in an elderly female.

## CASE DESCRIPTION

A 79-year-old female with a medical history of non-obstructive coronary artery disease and dyslipidaemia presented to our hospital with sudden onset of rectorrhagia of same-day duration. The patient had non-specific, colicky right-sided abdominal pain. There were no accompanying gastrointestinal symptoms such as nausea, vomiting or diarrhoea. She also denied any symptoms of fever, chest pain, dyspnoea, syncope or weight loss. The patient had no recorded familial incidence of colorectal cancer. On admission, her vitals were stable. An abdominal examination showed mild tenderness in the right upper quadrant with no guarding, and a negative Murphy's sign. A rectal examination was positive for active bleeding and blood clots. Laboratory testing revealed a haemoglobin level of 11 g/dl at admission, with a baseline haemoglobin of 13 g/dl. Four hours later, haemoglobin dropped to 8.1 g/dl. The rest of the routine blood testing, such as platelet counts, liver function tests and coagulation tests, were within normal range. An emergent computed tomography (CT) angiography showed active bleeding at the appendiceal orifice as seen in Fig. 1, with hyperdense material in the right colon and caecum, and uncomplicated diverticulosis. A colonoscopy conducted after preparation showed mild active oozing of blood and clots from the appendiceal orifice with no other source of bleeding in the right colon, as seen in Fig. 2. Moderate left-sided diverticulosis with old blood and no active bleeding

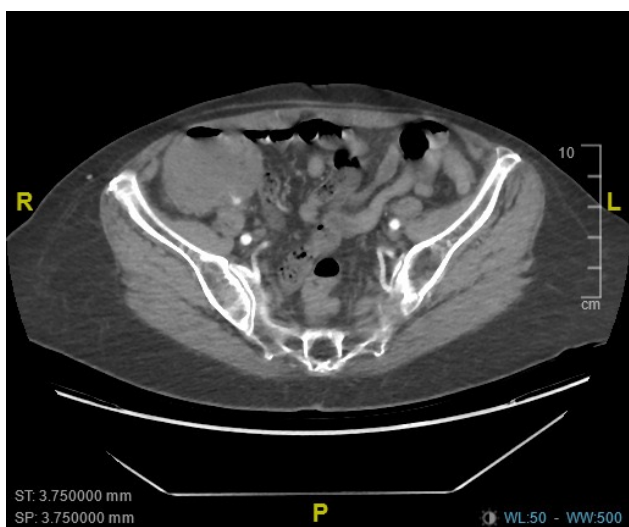


Figure 1. Screenshot from CT angiography abdomen pelvis showing active bleeding at the appendiceal orifice.

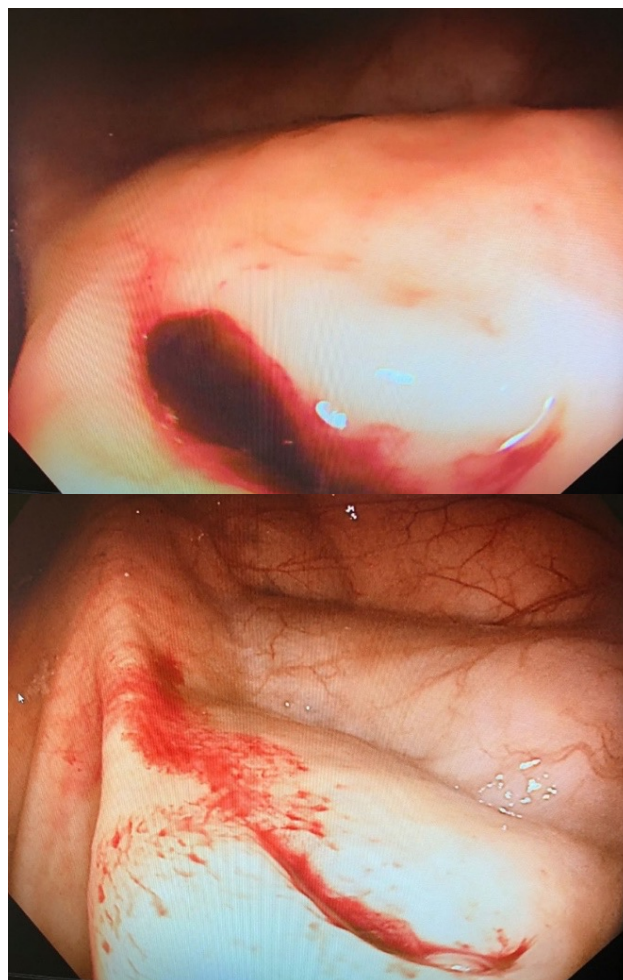


Figure 2. Screenshot from colonoscopy showing A) blood clotting at the appendiceal orifice and B) active oozing from the appendiceal orifice after removal of clots.



Figure 3. Image showing two mid-appendiceal adjacent ulcerations of internal mucosa after dissection and opening. The right ulceration shows a persistent adherent clot.

in the left colon with normal terminal ileum was observed. Within 12 hours, a laparoscopic appendectomy was performed. The appendix appeared grossly normal with no signs of swelling or enlargement. An appendectomy was performed by dissecting the base of the caecum, and then the appendix was cut using an Endo GIA™ stapler. On histopathology, the resected appendix measured 5 × 1.5 cm and showed two mid-appendiceal adjacent deep mucosal ulcerations of acute and chronic inflammation, granulation

tissue and focal foreign body giant cell reaction associated with injury from foreign material. No evidence of malignancy or vascular malformation was detected. The dissected appendiceal mucosa can be seen in Fig. 3.

Following the operation there was no recurrence of bleeding, no evidence of melena and no reported complications. The patient remained stable throughout and was discharged home accordingly at day 3 after her surgery.

## DISCUSSION

Acute lower gastrointestinal bleeding is frequently encountered in clinical settings, with the majority of cases arising from colonic pathology<sup>[1]</sup>. Bleeding from the appendix, on the contrary, is exceedingly uncommon, which can lead to late or incorrect diagnosis. Lower gastrointestinal bleeding is generally considered less severe than upper gastrointestinal bleeding, with most cases resulting in a self-limiting haemorrhage. However, bleeding from the appendix related to vascular disease such as Dieulafoy's lesion and angiodysplasia may lead to substantial lower GI bleeding and can occasionally be life-threatening<sup>[1-4]</sup>. Various other causes of appendiceal bleeding are possible, such as benign erosions and ulcers, appendicitis, carcinoids, lymphomas, diverticular disease, aorto-appendiceal fistulae and endometriosis<sup>[5]</sup>. As a physician, being aware of appendiceal bleeding is crucial. A literature review of pertinent articles related to 'appendix bleeding' on the PubMed/MEDLINE database was conducted. A few articles were found, and five of them are summarised in Table 1<sup>[6-10]</sup>. Based on the pathological findings in Table 1, the primary cause of appendiceal bleeding was related to a vascular cause, with Dieulafoy's lesion and angiodysplasia being the most common findings according to pathological analyses, with the average age of the included cases being 49 (range: 21-79 years). In our case, histopathologic observations showed two mid-appendiceal adjacent deep mucosal ulcerations, and focal foreign body giant cell reaction associated with injury from foreign material, most likely an appendicolith. We suspect

that our patient's appendiceal bleed originated from an ulcer secondary to a small appendicolith that passed through the appendiceal orifice and lodged in the appendiceal lumen, causing ulceration in the appendiceal mucosa with resultant bleeding. Another reason for her appendiceal ulceration is related to her aspirin use. Non-steroidal anti-inflammatory drug use can cause gastrointestinal side effects, including ulcers. The terminal ileum and proximal colon are the areas where NSAIDs can lead to damage due to prolonged exposure to the medication, as the pills might remain there for a longer time, contributing to local irritation and ulceration. The anticipated observation during colonoscopy and histological examination in a patient on NSAIDs would likely be non-specific ulcers in both the small and large intestines, resembling the focal ulceration observed in the appendiceal mucosa from our patient's histological sample<sup>[11]</sup>.

Various methods, including a contrast-enhanced abdominal CT scan, colonoscopy and angiography can be used to diagnose bleeding from the appendix<sup>[2,3,10]</sup>. A contrast-enhanced CT scan of the abdomen is beneficial for assessing the presence of neoplasm, diverticulum or acute inflammation. In our case, the CT scan of the abdomen with IV contrast on the arterial phase showed blush of contrast material at the level of the appendix, suggesting an active bleeding at this level. Based on the CT scan result, an urgent colonoscopy of our patient was performed after colonic cleansing to determine the source of the bleed. After careful endoscopic examination, active bleeding from the appendix with the presence of blood clots at the appendiceal opening was found. It is crucial for the endoscopist to reach the terminal ileum during the colonoscopy, and thoroughly inspect the orifice of the appendix to assess for any Dieulafoy's lesion or angiodysplasia, or any vascular malformation. In our case, an urgent appendectomy was performed, with a successful result manifested by the absence of haematochezia, and stability of the haemoglobin level during the post-operative period of the patient. The sample should be examined and assessed by the surgeon in the operating room before being

Case	Age/sex	Chief complaint	Haemoglobin (g/dl)	Technique	Treatment	Pathology
Xue et al. <sup>[6]</sup>	21/F	Massive haematochezia	10.6	Endoscopy	Appendectomy	Dieulafoy's lesion
Choi et al. <sup>[7]</sup>	72/M	Haematochezia	12.6	Endoscopy	Appendectomy	Angiodysplasia
Reynolds and Mejia <sup>[8]</sup>	68/M	Massive haematochezia	8.2	Endoscopy	Appendectomy	Dieulafoy's lesion
Gu et al. <sup>[9]</sup>	41/M	Melena	Not reported	Endoscopy	Appendectomy	Atypical florid vascular proliferation
Kyokane et al. <sup>[10]</sup>	76/F	Massive haematochezia	5.2	Angiography	Vessel embolisation + appendectomy	Angiodysplasia
Our case	79/F	Haematochezia	8.1	Endoscopy	Appendectomy	Ulcerations, injury from appendicolith

Table 1. Table showing findings from pertinent articles from literature review related to 'appendix bleeding' on the PubMed/MEDLINE database, compared to this case.

forwarded for pathological analysis. An effective treatment option for appendiceal bleeding is surgical management with appendectomy<sup>[2]</sup>. Alternative approaches such as vessel embolization and endoscopic treatment have been reported to successfully control bleeding<sup>[10]</sup>; nevertheless, the risk of acute appendicitis and recurrent bleeding following these procedures can be challenging to manage, potentially leading the patient to still need surgical treatment with an appendectomy<sup>[10]</sup>. Collection of data regarding vascular embolisation and endoscopic treatment is still ongoing.

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