

Small intestinal vascular malformation bleeding: A case report with imaging findings

Jun Cui, Liu-Ye Huang, Shu-Juan Lin, Long-Zhi Yi, Cheng-Rong Wu, Bo Zhang

Jun Cui, Liu-Ye Huang, Shu-Juan Lin, Long-Zhi Yi, Cheng-Rong Wu, Bo Zhang, Department of Gastroenterology, Yan tai Yu Huang Ding Hospital, Yantai 264000, Shandong Province, China
Author contributions: Cui J, Huang LY and Lin SJ designed and initiated the study; Lin SJ performed small intestinal endoscopy; Lin SJ and Yi LZ performed a literature search; additional cross-referencing was performed by Wu CR and Zhang B; Cui J drafted and wrote the paper.

Correspondence to: Dr. Lin Shu-Juan, Department of Gastroenterology, Yan tai Yu Huang Ding Hospital, Zhifu District, Yuhuangding east Road 20, Yantai 264000, Shandong Province, China. sdlsj123@126.com

Telephone: +86-535-6691999 Fax: +86-535-6240341

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Core tip: A 47-year-old man presented at the hospital 5 mo ago with dark stool. Several angiomas were detected by oral approach enteroscopy, but no active bleeding was observed. Additionally, no lesion was detected by anal approach enteroscopy; however, gastrointestinal tract bleeding occurred for an unknown reason. Ileal vascular malformation was detected by abdominal vascular enhanced computed tomography, and ileal angioma and vascular malformation were detected by a laparoscopic approach. Segmental resection was performed for both lesions, which were confirmed by pathological diagnosis. This report systemically emphasizes the imaging findings of small intestinal vascular malformation bleeding.

Abstract

The small intestine is approximately 5-6 m long and occupies a large area in the abdominal cavity. These factors preclude the use of ordinary endoscopy and X-ray to thoroughly examine the small intestine for bleeding of vascular malformations. Thus, the diagnosis of intestinal bleeding is very difficult. A 47-year-old man presented at the hospital 5 mo ago with dark stool. Several angiomas were detected by oral approach enteroscopy, but no active bleeding was observed. Additionally, no lesions were detected by anal approach enteroscopy; however, gastrointestinal tract bleeding still occurred for an unknown reason. We performed an abdominal vascular enhanced computed tomography examination and detected ileal vascular malformations. Ileum angioma and vascular malformation were detected by a laparoscopic approach, and segmental resection was performed for both lesions, which were confirmed by pathological diagnosis. This report systemically emphasizes the imaging findings of small intestinal vascular malformation bleeding.

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INTRODUCTION

Generally, the first sign of small intestinal disease is bleeding, the small intestine is about several meters long. These factors preclude the use of ordinary endoscopy and X-ray to thoroughly examine the small intestine^[1]. Electronic enteroscopy can be used to examine the small intestine^[2]. However, in some patients, bleeding of small intestinal lesions cannot be detected by enteroscopy because oral and anal approach enteroscopy do not reach a "blind region" from either side. Thus, a bleeding site in the "blind region" cannot be detected by enteroscopy, especially for cases of bleeding caused by vascular malformation. Generally, diagnoses of bleeding in the "blind

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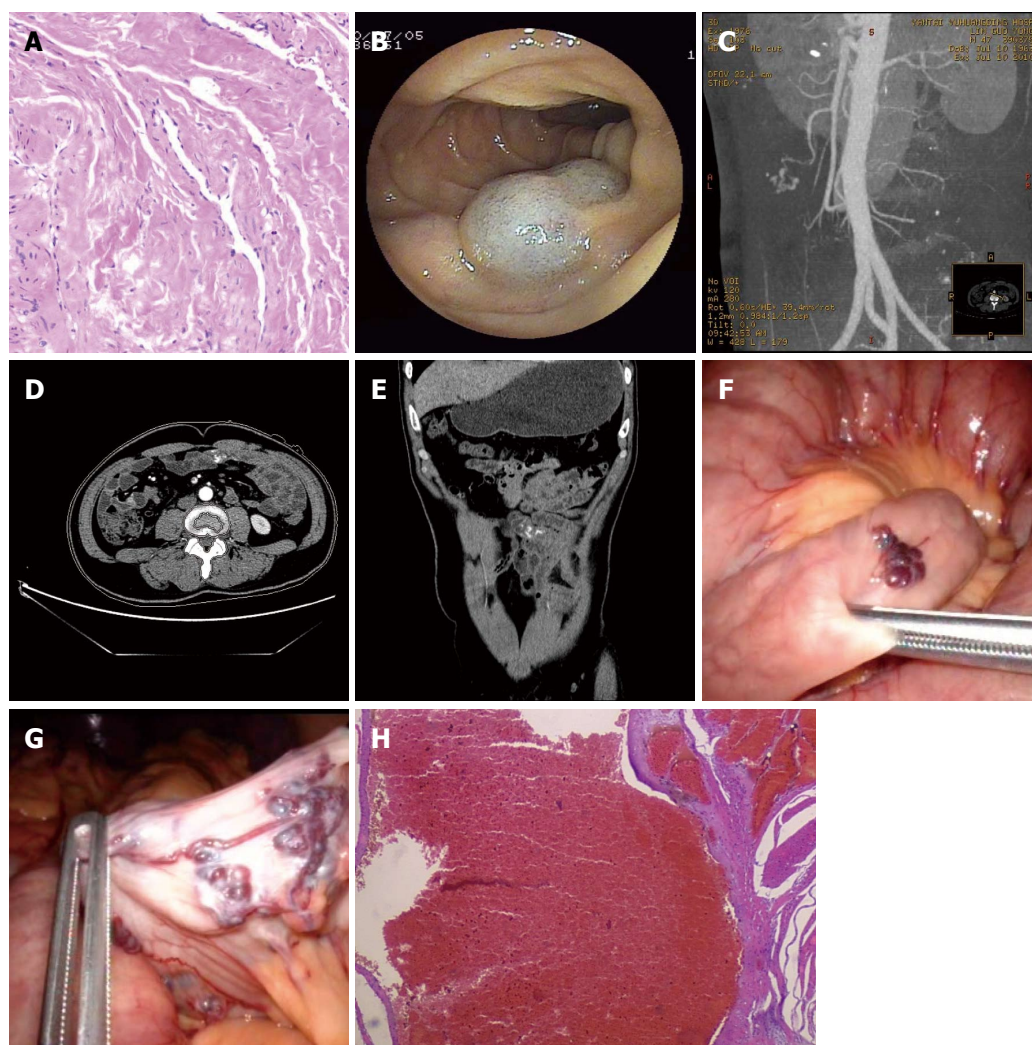


Figure 1 Skin, enteroscopy, abdominal vascular enhanced computed tomography, laparoscopy and pathological findings of the patient. A: Pathological analysis showed cavernous angioma on the right knee ($\times 400$); B: Angioma was indicated by oral approach enteroscopy; C: Anterior-venous malformation at the branch of the superior mesenteric artery was shown by abdominal vascular enhanced computed tomography (CT); D: Contrast media remained in the anterior-venous malformation, as shown by abdominal vascular enhanced CT at the cross section; E: Contrast media remained in the anterior-venous malformation, as shown by abdominal vascular enhanced CT in a reconstruction of a coronal view; F: A small intestinal angioma was detected by a laparoscopic approach; the tissue in this image corresponds to B; G: Anterior-venous malformation was found by a laparoscopic approach; the tissue in this image corresponds to C-E; H: By pathological examination, the resected small intestinal anterior-venous malformation was shown to have a vessel wall that was irregular, distorted and dilated ($\times 400$).

region” requires angiography, but angiography has the drawbacks of causing trauma, having a long time of duration and costing large amounts^[3].

Here, we report a case of bleeding at a small intestinal vascular malformation with an emphasis on the imaging findings obtained by small intestinal endoscopy, abdominal vascular contrast-enhanced computed tomography (CT), laparoscopy and pathology.

CASE REPORT

A 47-year-old man, presented at the hospital 5 mo ago with dark stool. The patient was anemic, with a hemoglobin level of 73 g/L. Several angiomas were detected by oral approach enteroscopy without active bleeding site detected. Additionally, no bleeding site was observed by anal approach enteroscopy; however, gastrointestinal tract bleeding still occurred for an unknown reason. Next, we performed

an abdominal vascular enhanced CT examination. After CT scanning, reconstruction for CT images was performed.

Ileal vascular malformation was detected by abdominal vascular enhanced CT, and ileal angioma and vascular malformation were detected by a laparoscopic procedure. Segmental resection was done for both lesions, which were confirmed by pathological diagnosis (Figure 1).

DISCUSSION

Small intestinal bleeding, which includes bleeding lesions located at any site from the Treitz ligament to the ileocecal junction, is known to occur for the following reasons: duodenal ulcer, inflammatory bowel disease or small intestinal vascular malformation or tumor^[4]. Among these conditions, vascular malformation, tumor and inflammatory bowel disease are the most common causes of bleeding. Because the small intestine is difficult to reach

by gastroscopes, duodenoscopes or colonoscopes, ordinary diagnostic methods have limitations for small intestinal examinations and, therefore, small intestinal bleeding is difficult to diagnose^[5].

Arteriography is useful for small intestine bleeding, however, according to previous reports, when extravasation of contrast media can be detected by X-ray, it means that the bleeding rate is more than 0.5 mL/min. Therefore, angiography is useful for the diagnosis of active gastrointestinal tract bleeding^[6]. However, arteriography can cause trauma, and it is only useful for vascular diseases or tumors with a rich blood supply.

When gastrointestinal tract bleeding cannot be controlled by non-surgical measures, exploratory laparotomy becomes necessary. Because the cause of bleeding is unclear, exploratory laparotomy can fail or the lesion might not be properly treated and, therefore, the postoperative re-bleeding rate is high. Recently, small intestinal bleeding has been diagnosed by enteroscopy, but not all bleeding sites could be detected^[7,8]. Diagnosis often fails because enteroscopy through both the mouth and anus does not cover the entire gastrointestinal tract. With image reconstruction function of enhanced CT, CT angiography has replaced ordinary angiography for the diagnosis of vascular malformation^[9,10]. For the patient described in this case report, vascular malformation was diagnosed by abdominal enhanced CT, while the malformation was not observed by enteroscopy. Therefore, for patients with small intestinal bleeding, we recommend that abdominal vascular enhanced CT should be conducted before a surgical operation to avoid missing other vascular malformations. We suggest this approach regardless of whether the bleeding sites can be detected by enteroscopy.

We reported a patient with cavernous angioma on the right knee. Several years later, small intestinal angioma and vascular malformation was detected by double-balloon enteroscopy and CT, indicating that he had multiple angiomas.

COMMENTS

Case characteristics

A 47-year-old man presented at hospital with dark stool.

Clinical diagnosis

The patient was anemic.

Differential diagnosis

Peptic ulcer, colon cancer, small intestinal tumor.

Laboratory diagnosis

Hemoglobin was 73 g/L.

Imaging diagnosis

Ileal vascular malformation was detected by abdominal vascular enhanced computed tomography (CT).

Pathological diagnosis

Small intestinal vascular malformation.

Treatment

Segmental resection was performed for the small intestinal angioma and vascular malformation by a laparoscopic approach.

Related reports

The small intestine was difficult to reach using a gastroscopes, duodenoscopes or colonoscopes. Therefore, these ordinary diagnostic methods were difficult to diagnose small intestine disease.

Explanation of terms

Abdominal vascular contrast-enhanced CT indicates that contrast media was injected through a peripheral vein. CT scanning indicates that CT images were obtained and refined by post-processing; the best images were selected for analysis and diagnosis.

Experiences and lessons

This paper shows that abdominal vascular enhanced CT has a practical value for the diagnosis of small intestinal vascular malformations. This approach can offset the shortcomings of double-balloon enteroscopy, and is especially useful for the diagnosis of obscure gastrointestinal tract bleeding.

Peer review

This is a case report of a patient with bleeding of a small intestinal vascular malformation with imaging findings. It is quite nice.

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