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CASE REPORT

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혈관 색전술시 사용한 금속 코일을 방사선 추적하여 최소 절개술로 절제한 공장 dieulafoy 병변 1예

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Minimal Resection of Jejuna Dieulafoy's Lesion Using an Intraoperative Fluoroscopic Localization of the Metallic Coils Used in Angiography

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Dieulafoy's lesions of the Jejunum are extremely rare. Therefore, localization of lesions is very difficult due to their small size and tendency of occasional bleeding. However, it is important to mention the location of the Dieulafoy's lesions to prevent excessive intestinal resections or, even worse, resection of the normal intestine. We report a case of preoperative localization of a Dieulafoy's lesion embolized by a metallic coil that allows a surgeon to accurately identify the bleeding, permitting a minimally invasive surgical treatment. A 25-year-old man presented with massive hematochezia. There was no definite bleeding focus on the upper gastrointestinal endoscopy and colonoscopy. An angiography found a persistent extravasation of the contrast media at the end of straight artery of the mid-jejunal branch, around the terminal ileum, embolized with metallic coils immediately. The combination of embolized metallic coils and intraoperative fluoroscopy allowed accurate identification and minimal laparotomy. Consequently, a highly selective and minimal resection of the jejunum containing the dieulafoy lesion was possible without any postoperative complications.
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Key Words: Jejunum; Dieulafoy; Coil; Embolization; Laparotomy

INTRODUCTION

Dieulafoy's lesions occur most frequently in the upper third body of the stomach along its lesser curvature. The reports of extragastric Dieulafoy's lesions are rare, and they tend to result in small bowel bleeding.[1] Despite advances of various diagnostic modalities, such as endoscopic, radiologic, and angiographic techniques, localization of small bowel bleeding is challenging.

To approach small bowel bleeding, balloon-assisted enteroscopy is a generally accepted modality.[2] However, it has some limitations; it can only investigate a part of the small bowel and sometimes an endoscopic treatment cannot be performed. Surgical resection is the last resort for uncontrolled small bowel bleeding or unidentified bleeding focus, with occasional unexpected large scale of skin incision or embarrassed resection of the uninvolved gut segment.

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We report a case of preoperative embolization of small bowel bleeding with a metallic coil. We hope to help surgeons to find the accurate bleeding site during a fluoroscopic-assisted operation. This method facilitated a minimal laparotomy and selected resections of the only involved bowel containing the Dieulafoy's lesions.

CASE REPORT

A 25-year-old man without any previous history of gastrointestinal disease arrived at the emergency room with overt hematochezia. He denied using non-steroidal anti-inflammatory drugs and had no history of smoking or excessive alcohol consumption. On physical examination, his blood pressure and pulse were 160/60 mmHg and 104 beats/min, respectively. Laboratory tests revealed a hemoglobin of 13.8 g/dL and a hematocrit of 39.0%, which were decreased from his baseline values (three months prior; 16.2 mg/dL and 47.4%, respectively). His platelet count and coagulation parameters were normal. The bleeding source was not identified by either the initial upper gastrointestinal endoscopy or colonoscopy. Given his unstable vital signs, an urgent angiography was performed, revealing a contrast extravasation at the terminal straight artery of the mid-jejunal branch (Fig. 1A). The bleeding site was catheterized with a microguide, and embolized with a glue. The patient was stabilized immediately after embolization. On subsequent abdominal CT, a small hyperdense embolic material was found in the jejunum, without any abnormal findings in the abdomen (Fig. 1B).

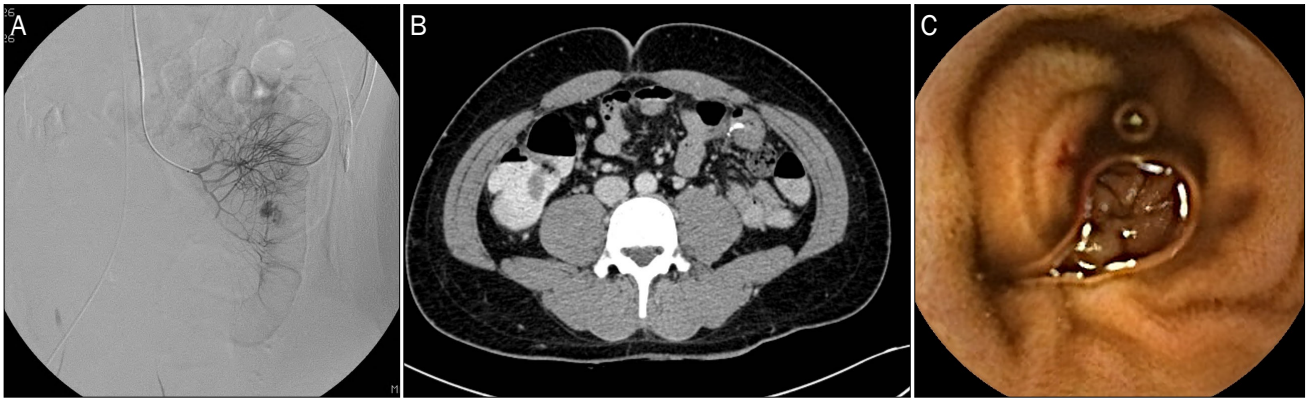

Fig. 1. (A) The superior mesenteric angiogram shows an aneurysmal dilation of the jejunal artery branch in the left upper quadrant. (B) Non-enhanced CT scan was performed immediately after transcutaneous arterial embolization to exclude the possibility of bleeding tumor. There is a radiopaque density in the jejunum due to glue accumulation, but no definite tumor was identified. (C) Wireless capsule endoscopy showed a 0.5-cm red spot in the proximal jejunum. CT, computed tomography.

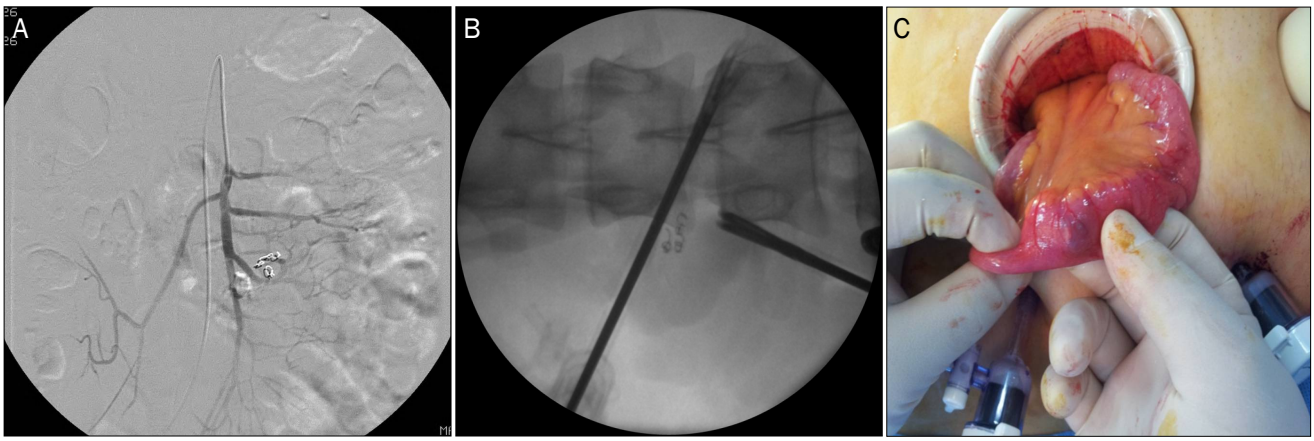

Fig. 2. (A) After confirmation of a re-bleed from the same site, a second embolization was performed with two metal coils. (B) Localization of the lesion through the detection of the recent embolic material under fluoroscopy. (C) A mass lesion responsible for the current bleeding was successfully removed by mini-laparotomy.

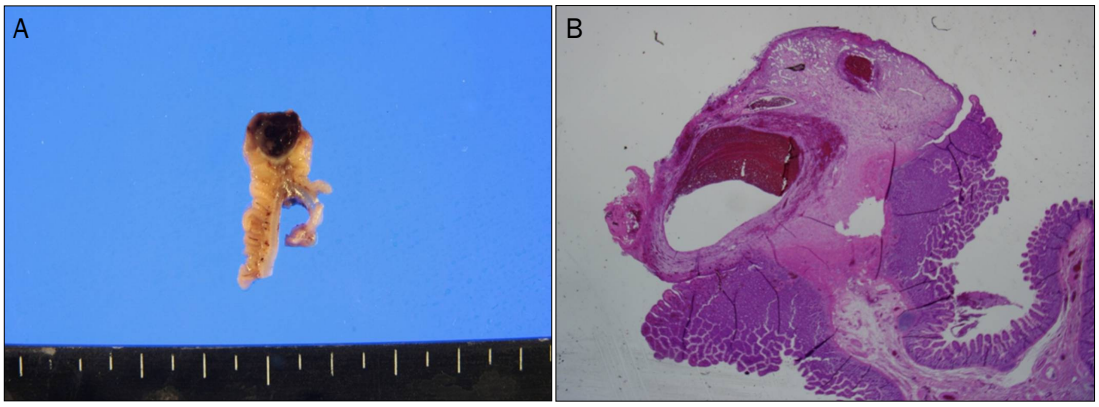

Fig. 3. (A) Gross examination of the resected jejunum showed a 1.3-cm, polypoid, intraluminal lesion. (B) Microscopic examination revealed a polypoid vascular malformation that was predominantly composed of capillaries (H&E, ×100).

A wireless capsule endoscopy revealed a 0.5 cm red spot in the proximal jejunum without active bleeding, which was presumed to be a recent bleeding lesion (Fig. 1C). The initial diagnosis was non-variceal small bowel bleeding controlled successfully. On the 7th post-embolization day, the patient developed a large amount of hematochezia over a period of eight hours. The emergency angiography demonstrated a point of contrast extravasation in the mid-jejunal branch of the superior mesenteric artery, near the previous embolized area. A second embolization was performed with only metallic coils, according to the preference by the interventional radiologists during the procedure (Fig. 2A). The type of microcoil is Tornado (Cook, Bloomington, IL, USA): caliber 0.018", maximal diameter when recoiled 3 mm, total length 20 mm. On the 14th day after the second embolization, the patient experienced a recurrent large volume hematochezia. A single-balloon enteroscopy was performed to further investigate the suspected bleeding focus–a red spot seen on the capsule endoscopy. However, the enteroscope was unable to reach the interested anatomical site. Therefore, open laparotomy and intraoperative enteroscopy were considered to identify the bleeding lesion and to remove the definite lesion. Despite this medical recommendation, the patient refused a large laparotomy. Consequently, a minimal laparotomy was performed via intra-operative fluoroscopy, which allowed an accurate localization with a marker created by the embolic metal coils (Fig. 2B).

The bleeding lesion was removed by segmental and minimal resection of the jejunum (Fig. 2C). Histologic examination confirmed the final diagnosis of Dieulafoy's lesion in the jejunum (Fig. 3A, B). The patient did well postoperatively and had no further bleeding. He was discharged on the 7th postoperative day. After 24 months of follow-up, he is asymptomatic without events of bleeding.

DISCUSSION

Gastrointestinal Dieulafoy's lesions are one of the most potentially serious causes of bleeding. The diagnosis is generally challenging due to intermittent bleeding and only being evident during hemorrhage.[3]

Before 1990, patients with life-threatening bleeding due to presumed small bowel hemorrhage have undergone laparotomy without a preoperative diagnosis. After the introduction of endoscopic treatment of Dieulafoy's lesions, an endoscopic therapy of small bowel bleeding became a generally accepted treatment modality.[4]

Endoscopic management for Dieulafoy's lesion has proven to be a highly effective diagnostic and therapeutic approach. After successful enteroscopic hemostasis, only 20% of patients experienced rebleeding.[5] Lipka et al.[2] reported no adverse events and showed that no patient required any surgery after treatment of Dieulafoy's lesion in small bowel with single-balloon enteroscopy.

Angiography is useful in the case of endoscopic failure or deteriorated vital signs. Metallic coil embolization can be performed precisely, minimizing the intestinal infarction. However, an increase of re-bleeding is a remained disadvantage.[6] The diagnostic criteria of Dieulafoy's lesion with angiography is not available; however, tortuous or ectatic vascular lesion with contrast leakage is a suggested

feature.[7] An angiography can be used to localize the lesion and immediately stop bleeding by embolization of the feeding vessel using a glue or metallic coils.[8] With advancements in the endoscopic or angiographic methods, surgical resection currently accounts for the 5% of Dieulafoy's lesions that were refractory to other treatments.

Recently, a minimally invasive surgery has become possible by pre-operative or intra-operative localization. Prasad RT et al. reported a case of transumbilical resection for bleeding jejunal Dieulafoy pseudopolyp with a combination of capsule endoscopy and laparoscopic wedge resection.[9] Several methods have been described to ensure a precise localization. Some advocates for staining the involved bowel segment with vital dyes (e.g., indigo carmine) to better identify the lesions during laparotomy.[10] Others have used an intraoperative methylene blue injection via an electively positioned catheter to identify the affected bowel segment.[11,12]

In our case, we used metallic coils to embolize the bleeding vessel for the second angiography. Fortunately, these coils allowed localization of the segmental mesenteric artery by an intra-operative fluoroscopy to make possible the minimal laparotomy and selected resections of the only involved bowel containing the Dieulafoy's lesions. Consequently, the combined approach of angiographic embolization and laparoscopic resection has revealed not only good results with respect to its curative endpoint, but also favorable cosmetic effects with minimal incision.

Therefore, after a failure of the initial endoscopic treatment, an angiographic embolization could stabilize the vital signs and completely stop bleeding. If the patient experienced recurrent bleedings after angiographic embolization, a definite surgical resection should be considered. At that time, if previous metallic coils were inserted, the embolized coils would be a marker to localize the lesions, make mini-laparotomy, or laparoscopic surgery possible. This combined approach using metallic coils could be a novel strategy to control recurrent non-variceal small bowel bleeding, especially for uncontrolled small bowel Dieulafoy's lesions.

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