Rupture of a Superior Mesenteric Artery Pseudoaneurysm Presenting with Asymptomatic Anemia

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Anemia is a common cause of referrals to gastroenterologists. Only a small number of anemia cases result from vascular abnormalities. Visceral artery aneurysms and pseudoaneurysms are rare forms of vascular disease that have significant potential for rupture, resulting in potentially life-threatening hemorrhaging. We present the case of a 70-year-old female patient with a pseudoaneurysm of the superior mesenteric artery complicated with rupture, who had no abdominal pain and only anemia. (Korean J Med 2015;88:560-563)

Keywords: Mesenteric artery, Superior; Pseudoaneurysm; Anemia

INTRODUCTION

Blood loss from the gastrointestinal tract is the most common cause of anemia in adult men and postmenopausal women. Other causes of anemia include intestinal malabsorption, as in celiac disease, gastrectomy, or gastric atrophy through achlorhydria, and Helicobacter pylori infection. A small subset of anemia is caused by vascular abnormalities.

An endoscopic evaluation should be considered in patients with confirmed anemia, unless there is a history of significant overt non-gastrointestinal blood loss. If no obvious lesions are detected by esophagogastroduodenoscopy and colonoscopy, evaluation of the small bowel by video capsule endoscopy or enteroscopy should also be considered in patients with symptoms suggestive of small bowel disease. However, in some cases, the causes of anemia are not detected by an endoscopic examination alone.

Visceral artery aneurysms and pseudoaneurysms are vascular
abnormalities that cannot be detected readily by routine endoscopic examinations. In addition, diagnosis of vascular diseases is more difficult because patients do not have predisposing symptoms in most cases. Thus, the condition of patients with these vascular abnormalities can quickly become life-threatening due to the sudden rupture of an aneurysm or pseudoaneurysm [1,2].

We report a case of a 70-year-old female with a ruptured pseudoaneurysm of the superior mesenteric artery (SMA), which was diagnosed with an abdominal contrast-enhanced computed tomography (CT) scan and treated by angiographic embolization.

CASE REPORT

A 70-year-old female patient was admitted to the hospital with mild dizziness. The patient had hypertension. She regularly took a calcium channel blocker and an angiotensin receptor blocker. Her blood pressure was known to be well-controlled according to her family, although exact information about her blood pressure before admission was not provided. She had no specific familial medical history, or any trauma or surgical history. The patient did not have any symptoms to suggest gastrointestinal bleeding.

On physical examination, her blood pressure was 123/67 mmHg and heart rate was 69/min. Body temperature was 36.6°C. The mental status of the patient was alert and her conjunctivas were pale. Lung sounds were clear and heartbeat was regular. Bowel sound was normoactive. There was no direct or rebound abdominal tenderness. A Levine tube was inserted into the patient’s stomach and irrigation with normal saline was performed. The color of saline after recovery through the Levin tube was clear. On digital rectal examination, no mass lesion was palpable and the color of the stool was normal. The hydrogen peroxide (H2O2) response of the patient’s stool was normal. A fecal occult blood test was not performed.

On a complete blood count, the white blood cell (WBC) was 8,600/mm³ (neutrophils 77.5%, lymphocytes 17.1%, monocytes 4.5%, eosinophils 0.5%), and hemoglobin and hematocrit were 3.7 g/dL and 11.5%, respectively. The platelet count was 186,000/mm³ and prothrombin time was 15.1 s (international normalized ratio [INR] = 1.43). On routine chemistry, total protein/albumin was 5.2/2.4 g/dL, AST/ALT was 8/5 IU/L, total bilirubin was 0.2 mg/dL, and alkaline phosphatase was 55 IU/L.

Due to the severe anemia, packed red blood cells (RBCs) were transfused. After the transfusion, hemoglobin was elevated to 11.4 g/dL. However, it decreased to 7.6 g/dL after 15 h.

To investigate the possibility of gastrointestinal bleeding, esophagogastroduodenoscopy and sigmoidoscopy were performed. However, we found nothing that would suggest gastrointestinal bleeding.

In addition, a contrast-enhanced CT scan was performed to find the cause of the bleeding. The scan revealed an -1.3 cm pseudoaneurysm of the SMA, in addition to a hematoma and hemoperitoneum due to the ruptured pseudoaneurysm (Fig. 1). Angiography for SMA was performed with access to the right femoral artery. A pseudoaneurysm was found in a branch of the SMA (Fig. 2).

The main feeding vessel was selected by microcatheter, and a selective embolization with glue was performed at a feeding vessel and the pseudoaneurysm. After embolization, the blood supply to the pseudoaneurysm was blocked, which was confirmed angiographically (Fig. 3).

The patient’s blood pressure was 123/67 mmHg when she came to the hospital. During admission, her blood pressure was...

Figure 1. Initial CT finding of superior mesenteric artery pseudoaneurysm. Initial CT scan shows a -1.3 cm pseudoaneurysm at the superior mesenteric artery branch (arrow) and hemoperitoneum in the abdominopelvic cavity (due to the pseudoaneurysmal rupture). CT, computed tomography.
kept stable. After the embolization, the level of hemoglobin was above 10.0 g/dL without additional bleeding signs. At 7 days after embolization, the patient was discharged.

The patient was followed-up at 2 weeks and 6 weeks after discharge. No bleeding event or abdominal symptom suggestive of bowel ischemia occurred. The level of hemoglobin was maintained above 10.0 g/dL. However, a follow-up CT scan could not be performed, because the patient did not revisit our clinic. We had a telephone interview with her family 12 weeks after discharge; no additional bleeding event had occurred.

**DISCUSSION**

An aneurysm is defined as pathological dilation of a segment of a blood vessel. Visceral artery aneurysms include both true aneurysms and pseudoaneurysms. In true aneurysms, all three layers of the arterial wall are intact, whereas pseudoaneurysms lack a complete arterial wall. Visceral artery aneurysm is a rare disease; the incidence in postmortem studies range from 0.01% to 0.2% [3]. The incidence of visceral artery pseudoaneurysms is even rarer, accounting for about 5% of all visceral artery aneurysms [4]. SMA aneurysms or pseudoaneurysms are the third most common visceral artery aneurysm (splenic and celiac artery aneurysms occur more frequently). The causes of SMA pseudoaneurysms are diverse, and include surgical injuries, abdominal trauma, chronic pancreatitis, atherosclerosis, medial necrosis, collagen vascular disease, arteritis, vascular dissections, and infection [4]. Most patients are asymptomatic prior to rupture, and diffuse abdominal pain may be the only symptom of the ruptured pseudoaneurysm. It is important that more than 50% of visceral artery aneurysms present acutely with rupture and show a mortality rate of about 10-25% [3]. Our patient showed severe anemia with no evidence of overt gastrointestinal bleeding or abdominal pain. Vital signs were stable during admission, although the SMA pseudoaneurysm had already ruptured. Thus, it was difficult to diagnose initially. In addition, there was no predisposing factor for SMA pseudoaneurysm in our patient. We assume that atherosclerosis or medial degeneration of the artery could have caused our patient’s SMA pseudoaneurysm.

A CT scan can be an excellent method in the differential diagnosis of SMA pseudoaneurysms. Specifically, a CT scan should be considered in patients with unidentifiable causes of anemia after other diagnostic methods fail to identify a cause.
Angiography is considered the gold standard for the diagnosis of aneurysms. Other associated vascular anomalies can also be revealed by angiography [5]. Endovascular techniques can be used to treat most visceral artery aneurysms regardless of the clinical presentation, etiology, and location of the aneurysm. Endovascular treatment is also indicated for ruptured visceral artery aneurysms in hemodynamically stable patients, especially when the aneurysm is poorly accessible for surgical treatment or when operative risks are high [6].

Recently, many studies on stent insertion in SMA pseudoaneurysms have been reported. McGraw et al. [7] reported the successful use of an autogenous vein-covered stent for management of an SMA pseudoaneurysm. Gandini et al. [8] reported an emergency endovascular treatment of giant SMA pseudoaneurysm using a polytetrafluoroethylene-covered nitinol stent. There is no definite superiority between embolization and stent insertion. We decided to treat the superior mesenteric artery pseudoaneurysm with an endovascular technique. However, embolization is feasible only in the case of small pseudoaneurysms, because treatment of large ones requires the use of large amounts of embolizing material for the complete occlusion of the affected vessel [8]. In addition, embolization is not believed to be appropriate in a case of a wide-neck pseudoaneurysm [9].

The main limitations to endovascular treatment are the availability of facilities for emergency treatment and the risk of failure due to difficulty in achieving selective catheterization [6]. Open surgery for SMA pseudoaneurysms is often rendered difficult by the underlying cause of the pseudoaneurysm (such as pancreatitis), anesthesia in an unstable patient, or by adhesions, which increase the risk of failure [10].

In our case, an abdominal contrast-enhanced CT scan revealed a ruptured SMA pseudoaneurysm and hemoperitoneum. Angiography definitively diagnosed the disease and the patient was treated with transcatheter embolization. Subsequently, no bleeding from the ruptured pseudoaneurysm was observed and no procedure-related complications were apparent. Following the procedure, the patient stabilized and we concluded that the decreased hemoglobin and hematocrit were due to the ruptured SMA pseudoaneurysm and not gastrointestinal bleeding.

SMA pseudoaneurysmal rupture can occur even in patients without risk factors or symptoms, such as abdominal pain. Thus, patients need to be evaluated with abdominal CT scans or angiography, even if asymptomatic anemia is the only evidence of an SMA pseudoaneurysmal rupture.

**REFERENCES**