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## Spontaneous dissection of the superior mesenteric artery as a rare cause of acute abdomen:report of two cases

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## Abstract

Spontaneous dissection of the superior mesenteric artery (SMA) is a rare condition. Here we report 2 cases of spontaneous SMA dissection causing acute abdomen. Bowel infarction did not occur in either case despite total occlusion or severe stenosis of the SMA;we successfully managed isolated SMA dissection without surgical intervention. Our nonoperative management regimen for spontaneous SMA dissection consisted of intestinal rest with fasting, administration of a vasodilator, and blood pressure control. Surgical intervention should be unnecessary unless complications, such as intestinal infarction and abdominal angina, occur.

**KEYWORDS:** acute abdomen, spontaneous dissection, superior mesenteric artery, nonoperative management

Case Report

## Spontaneous Dissection of the Superior Mesenteric Artery as a Rare Cause of Acute Abdomen: Report of Two Cases

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Spontaneous dissection of the superior mesenteric artery (SMA) is a rare condition. Here we report 2 cases of spontaneous SMA dissection causing acute abdomen. Bowel infarction did not occur in either case despite total occlusion or severe stenosis of the SMA; we successfully managed isolated SMA dissection without surgical intervention. Our nonoperative management regimen for spontaneous SMA dissection consisted of intestinal rest with fasting, administration of a vasodilator, and blood pressure control. Surgical intervention should be unnecessary unless complications, such as intestinal infarction and abdominal angina, occur.

**Key words:** acute abdomen, spontaneous dissection, superior mesenteric artery, nonoperative management

Spontaneous dissection of the superior mesenteric artery (SMA) is a rare condition. The etiology and natural history of spontaneous SMA dissection have not been well studied because of the scarcity of reported cases. However, the development of diagnostic imaging technology has led to an increased number of reports, including mild and asymptomatic cases [1-3]. It is possible that many patients with isolated SMA dissection have been overlooked in the treatment of acute abdomen due to lack of recognition. Here, we report 2 cases of spontaneous SMA dissection and argue its status as a cause of acute abdomen.

### Case Reports

**Case 1.** A 51-year-old man who had received medication for hypertension experienced a sudden onset of epigastralgia in January 2006. Although endoscopic examinations revealed no remarkable findings, he continued to complain of persistent abdominal pain. He was diagnosed as having isolated SMA dissection by computed tomography (CT) scan and was transferred to our hospital 2 weeks after symptomatic onset. On admission, the patient presented persistent abdominal discomfort with mild pain. His heart rate was 64 beats/min, and his blood pressure was 150/90 mmHg. Physical examination revealed no peritoneal irritation, and a vascular bruit was audible above the navel. Laboratory investigations produced no significant findings except for liver dysfunction due to chronic hepatitis. An enhanced CT scan revealed spontaneous SMA dissection beginning approximately 2 cm from the ostium and a partially thrombosed false

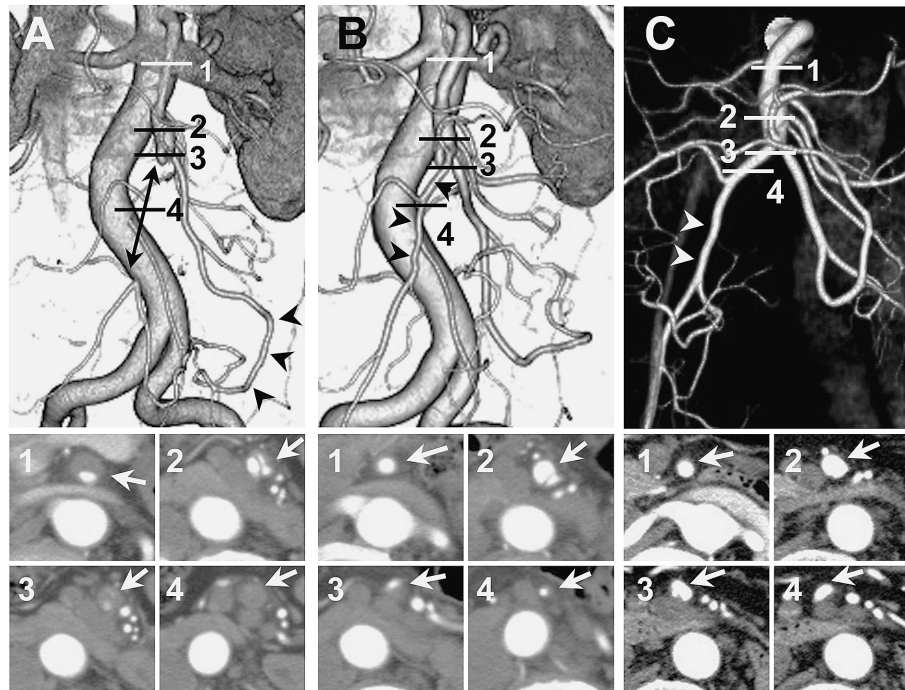
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lumen that completely compressed the true lumen by 5 cm (Fig. 1A). However, distal blood flow was preserved via the mesenteric marginal artery, and bowel infarction did not occur despite 2 weeks of total occlusion of the SMA. Therefore, the patient was managed nonoperatively after admission. A vasodilator, prostaglandin E<sub>1</sub>, was administered continuously at a dose of 0.02 μg/kg/min for 5 days. Abdominal pain gradually subsided within 1 week, and the patient was allowed to take foods 11 days after admission. He was discharged 22 days after admission because his symptoms were not exacerbated by eating. Follow-up examinations revealed that the intramural hematoma was completely absorbed and that the caliber of the occluded main trunk of SMA was restored (Fig. 1B, C). He remains well without any recurrent symptoms.

**Case 2.** A 56-year-old man who had a history of hypertension was admitted to a local hospital in February 2006 with sudden onset of abdominal pain. A CT scan disclosed isolated dissection of the SMA,

and the patient was subsequently referred to our hospital. On admission, his abdominal pain was improved by treatment with analgesics. His heart rate was 72 beats/min, and his blood pressure was 146/86 mmHg. There were no remarkable findings on physical examination except for vascular bruit over the epigastrium. Laboratory tests showed no abnormalities. A CT scan with contrast media revealed a dilated SMA divided into 2 lumina by an intimal flap and an intramural hematoma beginning approximately 1 cm from the orifice (Fig. 2A). A portion of the true lumen of the dissected SMA was highly compressed by a thrombosed false lumen; however, the mesenteric marginal artery served as a collateral vessel on the distal side of the SMA. He was treated conservatively, taking into consideration the clinical course of case 1. A vasodilator, prostaglandin E<sub>1</sub>, was administered continuously at a dose of 0.02 μg/kg/min for 4 days. The patient was allowed to take foods 9 days after admission and did not develop abdominal angina.



**Fig. 1** **A**, A CT scan after admission showed a dissected false lumen of the SMA compressing the true lumen (arrows) and complete obstruction of the SMA for 5 cm (double arrow line and slice 4). There was a dilated mesenteric marginal artery originating proximal to the occlusion (arrowheads), and distal branches of the SMA were observed via the collateral artery; **B**, Three months later, the thrombosed false lumen was almost completely absorbed; this led to the opening of the main trunk of the SMA (arrowheads and slice 4); **C**, A CT scan 18 months after onset demonstrated complete restoration of the SMA trunk with absorption of the thrombosed false lumen (arrowheads).

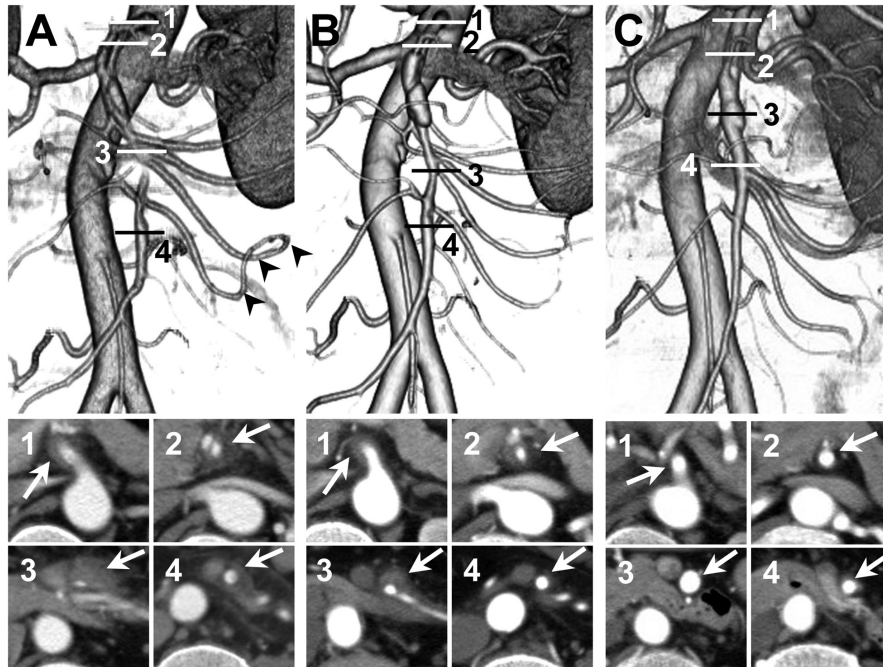
A CT scan 2 weeks later demonstrated improvement of the narrowing of the true lumen (Fig. 2B). The patient was discharged 25 days after admission. A CT scan 10 months after onset revealed absorption of the thrombosed false lumen and restoration of the caliber of the main trunk of the SMA (Fig. 2C). He continues to be in good condition.

### Discussion

Although the etiology of spontaneous dissection of the SMA may include arteriosclerosis, fibromuscular dysplasia, congenital connective tissue disorders, and trauma, the definitive cause is unclear in most cases [4]. The clinical symptoms of isolated SMA dissection usually include acute-onset abdominal pain at the epigastrium or, in some cases, chronic abdominal pain, which is sometimes related to food intake. Additionally, patients may occasionally be asymptomatic [1, 2]. Spontaneous SMA dissection used to be diagnosed by angiography; more recently, CT scans

have become the most reliable diagnostic modality. A previous report demonstrated that increased attenuation of the fat around the SMA is a useful finding even on a thick-section plain CT scan [3]. Contrast-enhanced CT scans should be considered for differential diagnosis in the case of acute abdomen with such findings on CT scans.

There is currently no established guideline for isolated SMA dissection. Miyamoto *et al.* reported that 24 out of 55 patients with spontaneous SMA dissection were treated conservatively. Obstruction of the main SMA trunk does not always result in bowel infarction because of the existence of the mesenteric marginal artery. The distal blood flow can be preserved if branches located proximal to the stenosis serve as collateral vessels. In the present cases, intestinal necrosis did not occur despite total obstruction or severe narrowing of the SMA; furthermore, the obstructed and narrowed main trunk of the SMA was finally restored. These findings suggest that surgical intervention may not be necessary unless compli-



**Fig. 2** **A**, A CT scan after admission revealed the dissected SMA (arrows). A portion of the true lumen was severely compressed by the thrombosed false lumen (slice 3), and the mesenteric marginal artery acted as a collateral vessel for the distal side of the SMA (arrowheads); **B**, Two weeks later, the intramural hematoma was mildly resolved with dilatation of the SMA trunk (slice 3); **C**, A CT scan 10 months after onset demonstrated complete restoration of the SMA trunk with absorption of the thrombosed false lumen (arrows). A portion of the main trunk of the SMA showed a slight aneurysmal dilatation, which will require careful follow-up (slice 3).

cations such as intestinal infarction and abdominal angina occur. Our nonoperative management regimen for spontaneous SMA dissection consisted of the following elements: confirmation of the existence of mesenteric collateral vessels on CT angiography; intestinal rest with fasting; administration of a vasodilator, such as prostaglandin E<sub>1</sub>, until the patient's symptoms subside; and blood pressure control to a systolic blood pressure of around 120mmHg. We should also recognize that surgical intervention is necessary in the presence of the following indications: bowel infarction or aneurysmal rupture of a dissected SMA in the acute phase, persistent symptoms refractory to conservative therapy in the sub-acute phase, and enlargement of a dissecting aneurysm or abdominal angina accompanying food intake in the chronic phase [5]. Recently, endovascular stenting has been reported as a treatment for SMA dissection [4, 6]. Endoluminal intervention is obviously less invasive than open surgery unless intestinal infarction occurs; endovascular stenting may become a valuable option for mesenteric revascularization in the near future.

We conclude that isolated SMA dissection should be recognized as a cause of acute abdomen and that conservative therapy should first be taken into consid-

eration. Accumulation of further information is indispensable for establishment of an optimal management regimen for spontaneous SMA dissection.

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