Spontaneous Isolated Dissection of the Superior Mesenteric Artery

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Abstract

A case of a 63-year-old man with isolated dissection of the superior mesenteric artery (SMA), demonstrated by enhanced computed tomography (CT) and abdominal angiography, was admitted to our hospital. The severity of this disease varies from mild to severe; the severe cases require surgery. But the mild cases, like the one presented here, only need conservative therapy. This case demonstrated the usefulness of anticoagulation therapy and the indications for surgical and radiological intervention. (Intrenal Medicine 41: 713–716, 2002)

Key words: acute abdomen, abdominal angiography, enhanced computed tomography, anticoagulation therapy

Introduction

Isolated spontaneous dissection of the main trunk of the superior mesenteric artery (SMA), not associated with aortic dissection, is very rare. Only 29 cases with this condition have been reported to date (1). This disease occurs with symptoms of an acute abdomen. Sometimes this condition may resolve spontaneously, and can be overlooked with conventional medical treatment. The rare case presented here was confirmed by enhanced computed tomography (CT). Further improvement in the CT resolution would make it easier to find dissections of the minor arteries. The cause still remains unknown. Angitis of the small arteries is sometimes accompanied with an aneurysm, like the coronary aneurysm associated with Kawasaki disease, but not with a dissection. Instead, angitis is a possible cause thought to be associated with this condition (2), because occasionally, the other arteries are also dissected or thrombosed (3). The medical or surgical treatment has not been established (4, 5). In the case presented here, angiography helped us to carefully follow the patient's condition, which could be man-

aged medically and not surgically. This patient was treated with anticoagulation therapy and has remained asymptomatic without any complications.

Case Report

A previously healthy 63-year-old man consulted his family doctor with the complaint of sudden lower abdominal pain, which occurred one hour after lunch. There was no history of trauma. No associated symptoms of fever, nausea, vomiting or constipation were present, but a small amount of loose tarry stool was seen. On admission in our hospital, he was afebrile and his blood pressure was not elevated (134/86 mmHg). The abdomen had normal bowel sounds on auscultation, but a soft vascular bruit was heard. It was soft but mildly tender to deep palpitation over the epigastrium. No rebound tenderness was noted. Vascular examination revealed normal pulses in the carotid, radial, femoral and pedal arteries. His laboratory studies showed mild leukocytosis (15,700/ μ l) and a high C reactive protein value (4.4 mg/dl), but other data such as the transaminase or serum creatinine were within normal range.

He was prohibited from eating and was given antibiotics and a fluid infusion. He continued to have abdominal pain, which was partially relieved with analgesics. An abdominal plain X-ray film revealed a nonspecific ileus and an abdominal ultrasound revealed no abnormal findings. We suspected an ischemic colitis and had the patient undergo an enhanced CT scan (Fig. 1). It revealed an isolated dissection of the superior mesenteric artery beginning about 1.5 cm from its proximal origin and extending distally for 10 cm. The dissection (intramural hematoma) had a thrombosed pseudolumen with slight narrowing of the true lumen with a caliber of approximately 5 mm. Three days later, though he remained asymptomatic, another abdominal CT scan was performed, which revealed mild progression of the dissection and modest reduction of the true arterial lumen. Angiography showed that the SMA was severely stenotic and friable with multiple thrombi, and several of its smaller branches were severely inflamed (Fig.

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Figure 1. Abdominal enhanced computed tomography on admission: An isolated dissection (intramural hematoma) was recognized at the origin of the superior mesenteric artery.

Figure 2. Abdominal angiography of the superior mesenteric artery (SMA): A stenotic true lumen and ulcer-like phenomenon (ULP) were recognized at the origin of the SMA. The arrow indicates the ULP of the SMA dissection. Spiral-shaped collateral circulation of the SMA was also found.

Figure 3. Abdominal angiography of the inferior mesenteric artery: A diffusely degenerated vessel with multiple thrombi was found.

Figure 4. Abdominal angiography of the celiac artery: The arrow shows a 90% stenosis of the origin of the celiac artery. There is a great volume of collateral flow from the splenic artery to the SMA.

2). The dissection of the SMA had extended to the jejunal branch and an ulcer-like projection was recognized 2–3 cm from its proximal origin. Other arteries such as the bilateral renal arteries and inferior mesenteric artery (IMA) were also degenerated with thrombi or fibromuscular dysplasia (Fig. 3). The beginning of the celiac artery (Fig. 4) had a 90% stenosis, and the splenic artery had a large collateral branch to the SMA. The doppler echo showed that the blood flow to the colon was adequate. Anticoagulation therapy (warfarin 2 mg/day) was administered to prevent thrombosis of the true lumen and to prevent embolic events. His laboratory data (inflammatory reaction) was normalized within about 2 weeks and he was discharged free of abdominal pain with the same dose of warfarin. Six months later, a CT scan (Fig. 5) revealed a regressed and completely thrombosed pseudolumen and a normally-dilated true artery lumen. He was healthy and free of abdominal symptoms with normal blood and urine examinations one year and three months later.

Discussion

The cause and natural history of spontaneous dissections of the SMA are unknown because of the scarcity of reported cases (2, 4–13). There are now only 30 cases of this condition that have been reported, including the present report. The vast majority of these patients (24/30) were males with an average age of 53.2 years. Six patients had associated aneurysms in other arteries including the renal, common iliac and coronary arteries (3, 14, 15). The origin of the dissection has been reported in 14 cases (1) and has been reported to typically be located between 1 and 6 cm from the aorta (mean 2.6 cm). No correlation with cystic media necrosis, fibromuscular dysplasia or arteriosclerosis has been found. Indeed, our patient had no history of smoking, hypertension, hyperlipidemia, nor diabetes mellitus. There were no laboratory or physical findings suggestive of

Figure 5. Abdominal enhanced computed tomography at 6 months: We can see a regressed and completely thrombosed pseudolumen and a normally dilated true artery lumen at the origin of the superior mesenteric artery.

arthritis, such as autoimmune antibody, positive urine protein, purpura, and polyarthralgia. No associated diseases, such as connective tissue disorders, coagulation abnormalities, cancer or hypothyroidism were present.

Angiography of this case revealed some lesions of arteriosclerosis or arthritis, such as the stenosis of the celiac artery and the IMA degeneration. However, as mentioned in the case reports, there is generally thought to be no correlation between these phenomena and the SMA dissection. The collateral from the splenic artery to the SMA seemed to show chronic ischemia of the colon blood flow.

Abdominal CT scans were a reliable method for the evaluation of this condition (15, 16). There are no current recommendations for the interval between the scans. Imaging studies should be obtained whenever questions arise concerning the progression of the disease, especially when the patient is symptomatic.

Only four of the cases mentioned above were managed successfully with a non-operative approach (1). None of those patients were treated with anticoagulation therapy. This is in contrast to the established treatment for spontaneous peripheral artery dissections such as that with the carotid artery. The present patient with spontaneous resolution of symptoms was considered to be a good candidate for anticoagulation therapy. This rare case was followed with close CT scan reviews and conservative treatment without any abdominal symptoms. Since 1988 when the first isolated SMA dissection was reported in Japan (4), of 7 Japanese patients, the last 4 cases have been treated non-operatively. Accordingly, with the improvement in the CT resolution, these types of minor artery dissections are believed to be diagnosed much earlier (16, 17). This may be the reason why conservative therapy for this disease has increased. There is the opinion that a non-operative approach with the use of anticoagulation therapy for SMA dissections requires very close follow-up, but unfortunately does not prevent the progression of the disease. Indications for surgery (18) seem to be : an increasing size of the aneurismal dilatation of the SMA, thrombosis of the lumen of the SMA or symptoms persisting despite anticoagulation therapy. Other invasive, but effective therapies, such as laparoscopic operations (19) and catheter intervention (20), have been reported.

The prognosis of peripheral artery dissections is still unclear, and the results of non-operative cases with this condition are also unknown. It has not been possible to clearly establish the course of death. The cause of death has usually been considered to be thrombosis or rupture of the vessel, which leads to an acute intestinal infarction.

References

- 1) Sparks SR, Vasquez JC, Bergen JJ, et al. Failure of nonoperative management of isolated superior mesenteric artery dissection. *Ann Vasc Surg* **14**: 105–109, 2000.
- 2) Bauerfeld SR, Jackson F. Dissecting aneurysm of the aorta: A presentation of fifteen cases and a review of the recent literature. *Ann Intern Med* **26**: 873–889, 1947.
- 3) Boquist L, Berg P. Multiple dissecting aneurysms in peripheral arteries. *J Pathol* **100**: 145–148, 1970.
- 4) Kotoh K, Suzuki M, Hashimoto H, et al. A case of spontaneous dissection of the superior mesenteric artery. *Jpn J Cardiovasc Surg* **19**: 25–27, 1989.
- 5) Nakamura K, Nozoe M, Sakakibara Y, et al. Natural history of a spontaneous dissecting aneurysm of the proximal superior mesenteric artery: Report of a case. *Jpn J Surg* **27**: 272–274, 1997.
- 6) Ramchand S, Suh SH, Gonzalez-Crussi F. Dissecting aneurysm of the superior mesenteric artery. *Can Med Assoc J* **101**: 356–358, 1969.
- 7) Clark F, Murray SM. Steatorrhea due to dissecting aneurysm of the superior mesenteric artery. *Brit Med J* **91**: 965–966, 1962.
- 8) Jean C, Marois M, Brocher P. Aneurysme disquant primitif de l'artere esenterique superieure. *Can Med Assoc J* **85**: 942–943, 1961.
- 9) Rignault D, Pailler JL, Molinie C, et al. Un cas d'anevrisme disquant de l'origine de la mesenterique superieure. *Angeiologie XXVIII-1*: 29–34, 1976.
- 10) Ralston LS, Wasdahl WA, Forks G. Isolated dissecting aneurysms. *Arch Intern Med* **105**: 157–160, 1960.
- 11) Ando M, Ito M, Mishima Y. Spontaneous dissecting aneurysm of the main trunk of the superior mesenteric artery: report of a case. *Jpn J Surg* **25**: 468–470, 1995.
- 12) Yasuhara H, Shigematsu H, Muto T, et al. Self-limited spontaneous dissection of the main trunk of the superior mesenteric artery. *J Vasc Surg* **27**: 776–779, 1998.
- 13) Common AA, Pressacco J. Chronic dissection of the superior mesenteric artery: case report. *Can Assoc Radiol J* **50**: 23–25, 1999.
- 14) Foord AG, Lewis RD. Primary dissecting aneurysms of peripheral and pulmonary arteries. *Arch Pathol* **68**: 87–89, 1959.
- 15) Guthrie W, Maclean H. Dissecting aneurysms of arteries other than the aorta. *J Pathol* **108**: 219–235, 1972.
- 16) Hyodoh H, Hyodoh K, Takahashi K, et al. Three-dimensional CT imaging of an isolated dissecting aneurysm of the superior mesenteric artery. *Abdom Imaging* **21**: 515–516, 1996.
- 17) Barneir E, Halachmi S, Croitoru S, et al. CT angiography diagnosis of spontaneous dissection of the superior mesenteric artery. *AJR* **171**: 1429–1430, 1998.
- 18) Ina K, Nakasone Y, Nakachi H, et al. Surgical treatment of spontaneous dissection of the superior mesenteric artery: A case report. *Ann Thorac Cardiovasc Surg* **6**: 65–69, 2000.
- 19) Massoud WZ. Laparoscopic management of superior mesenteric artery syndrome. *Int Surg* **80**: 322–327, 1995.
- 20) Oduray A, Sniderman KW, Colapinto RF. Intestinal angina: percutaneous transluminal angioplasty of the celiac and superior mesenteric arteries. *Radiology* **167**: 59–62, 1988.