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Case Report Open Access

Isolated Spontaneous Dissection of the Superior Mesenteric Artery: Report of Two Cases

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Abstract

Isolated spontaneous superior mesenteric artery (SMA) dissection is rare, and difficult to diagnose due to nonspecific signs and symptoms. The clinic presentations include abdominal pain, nausea, and vomiting. The incidence appears to be increasing, possibly as a result of the widespread use of computed tomography angiography (CTA) imaging for abdominal pain. There is no consensus regarding the best treatment of spontaneous isolated dissection of the SMA.

Herein, we present 2 cases in which isolated superior mesenteric dissection was diagnosed by CTA. The first case received conservative treatment, and the other case received endovascular therapy. Both patients had good long-term clinical results.

Keywords: Isolated spontaneous superior mesenteric artery dissection; Endovascular therapy

Introduction

Isolated spontaneous superior mesenteric artery (SMA) dissection is rare, and difficult to diagnose due to nonspecific signs and symptoms [1]. The clinic presentations include abdominal pain, nausea, and vomiting. Due to advances in imaging technology, such as computed tomography angiography (CTA), the disease is diagnosed more often [2].

The treatment methods include medical therapy, surgical intervention, and endovascular therapy. However, the best treatment is still unclear [3]. Herein, we present 2 cases in which isolated spontaneous SMA dissection was diagnosed by CTA. The first patient received conservative treatment and the other received endovascular therapy. Both patients had good mid-term results.

Case 1

A 71-year-old male presented to our emergency department with acute onset of abdominal pain. His history was only significant for hypertension under medical control, and had no recent trauma. The pain was located in his upper abdomen. He rated the pain as 10 (worse ever) on a scale from 1-10.

Physical examination revealed epigastric tenderness, but his abdomen was soft on palpation without abdominal guarding. Peripheral pulses were palpable, and there was no tenderness on palpation of the kidneys. Laboratory tests and abdominal radiography were unremarkable.

Computed tomography angiography (CTA) was performed, and revealed dissection of the SMA 2.3 cm from the origin, and 18.87 mm in length (Figure 1). There was no evidence of bowel necrosis such as bowel thickening or abnormal contrast enhancement.

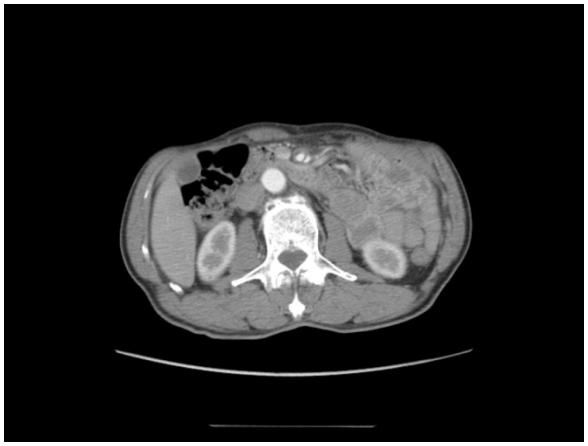

Figure 1: Abdominal enhanced computed tomography in the emergency department showed isolated dissection of the superior mesenteric artery.

The patient was admitted to the gastrointestinal ward and received anticoagulation and analgesics. However, his symptoms did not improve after 1 day of conservative treatment, and an angiogram was performed. A 6F catheter (Judkins right, Medtronic) was used to catheterize the SMA *via* a right femoral artery approach. Selective angiogram revealed SMA dissection with true lumen compromise with visible distal branches (Figure 2A). Management with endovascular therapy instead of surgical intervention was performed. An 8F guiding catheter (Judkins right, Medtronic) was introduced into the SMA ostium *via* the right femoral approach. After infusion of 5000 IU

heparin, we wired SMA with a 0.018-inch guidewire (V18, Boston) and a balloon expandable stent (6 × 40 mm; Assurant, Medtronic) was deployed to the middle of the SMA (Figure 2B). Angiography revealed good blood flow with preservation of all side branches (Figure 3).

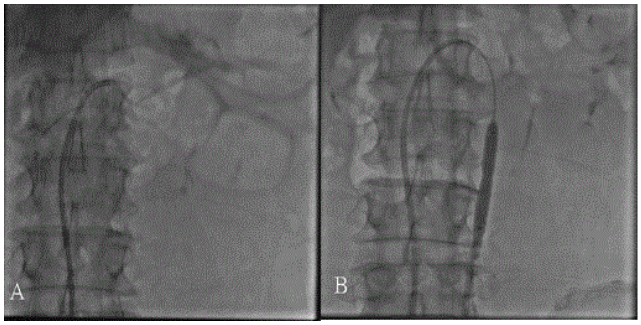

Figure 2: Endovascular therapy of case A) 8F guiding catheter (Judkins right, Medtronic) was introduced into the superior mesenteric artery (SMA) ostium via a right femoral approach, and a 0.018 inch guidewire (V18, Boston) was placed, B) A balloon expandable stent (6 × 40 mm; Assurant, Medtronic) was deployed at the middle of the SMA, and inflated to 10 atm.

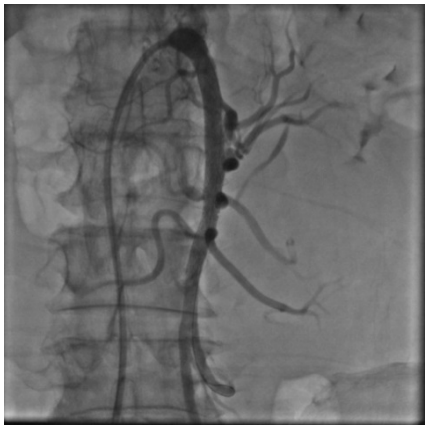

Figure 3: Final results of case 1 after stenting. All side branches were well preserved.

The epigastric pain resolved after the procedure. His postoperative course was uneventful, and he was discharged 2 days later on acetylsalicylic acid and clopidogrel. He has remained asymptomatic for 2 years.

Case 2

A 64-year-old male presented to our emergency department with periumbilical pain associated with nausea and vomiting. His history was significant for a percutaneous coronary intervention (PCI) due to ST-elevation myocardial infarction (STEMI) and left anterior descending (LAD) coronary artery obstruction. His history was also significant for hypertension under medical control, and had no recent trauma. The pain was located in the epigastric area, and he rated it as 9 on a scale of 1-10. Physical examination revealed epigastric tenderness with mild rebound pain. Peripheral pulses were intact, and no abdominal bruit was audible. Laboratory tests and abdominal radiography were unremarkable. CTA was performed and revealed dissection of the SMA 1.48 cm from the origin with a length of 32.78 mm (Figure 4). There was no evidence of bowel necrosis.

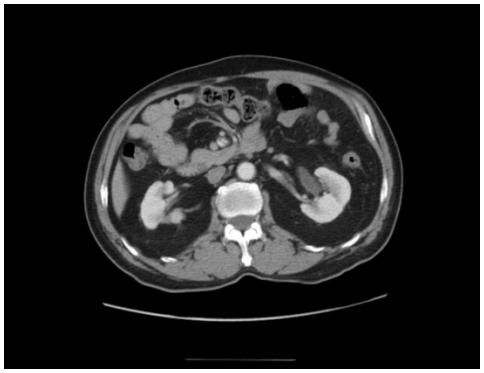

Figure 4: Abdominal enhanced computed tomography in the emergency department showed isolated dissection of the superior mesenteric artery.

The patient was admitted to the gastrointestinal ward and placed on bowel rest, analgesics for pain control, intravenous hydration, and anticoagulation (heparin). His symptoms improved after 1 day of conservative treatment. The patient was transitioned from heparin to warfarin, and an international normalized ratio (INR) of 2.6 was achieved on hospital day 5. The patient was discharged home on warfarin, and has remained asymptomatic for 2 years.

Discussion

Spontaneous SMA dissection not associated with aortic dissection is a rare entity, and the nature history is unknown. The condition was first described by Bauersfeld in 1947 [4]. Solis et al. [5] hypothesized that dissection usually begins at 1.5 cm to 3 cm from the orifice of the SMA, thus sparing the origin of the artery. The dissection is caused by stress on the arterial wall at the inferior edge of the pancreas. The etiology of the disease has not been well-established, but atherosclerosis, cystic media necrosis, and fibromuscular dysplasia have been implicated [1]. Indeed, our patients had a history of hypertension. There were no laboratory or physical findings consistent with arthritis, such as autoimmune antibodies, positive urine protein, purpura, or polyarthralgia. No associated diseases, such as connective tissue disorders, coagulation abnormalities, or cancer were present.

The 4 most common symptoms of SMA dissection in decreasing order of frequency are acute isolated abdominal pain, abdominal pain with vomiting, subacute intestinal obstruction, and asymptomatic [6]. Both of our patients had epigastric pain without radiating pain or muscle guarding, which are nonspecific making it easy to overlook a diagnosis of SMA dissection. In almost all cases, diagnosis of SMA dissection is made by abdominal CT imaging with intravenous contrast administration performed for evaluation of abdominal pain.

Because SMA dissection is relatively rare, standard diagnostic and therapeutic approaches have not been established. Therapeutic options included medical, surgical, and endovascular management [3,5,7-9]. Some cases have been successfully treated by conservative therapy, such as bowel rest, anticoagulation, and antiplatelet agents. Karagacil et

al. [10] reported that anticoagulation is effective for the prevention of thrombosis formation in patients with spontaneous internal carotid artery dissection. In the case of SMA dissection, thrombi formation may occur when the true lumen is compressed by the false lumen, leading to bowel necrosis. Anticoagulation therapy, therefore, is a reasonable option for treatment. Nagai et al. [11] suggested that the disease pattern of SMA dissection is similar to that of carotid artery dissection, and emphasized anticoagulation therapy is necessary for SMA dissection. Both of our patients received heparin infusion on admission. The second patient had a good response to medical management, and has remained symptom free on warfarin.

Sparks et al. have suggested that indications for surgery are an increase in the size of the aneurysmal dilatation of the SMA, luminal thrombosis, or persistent symptoms despite anticoagulation [12]. Various procedures for surgical intervention have been reported, including aorto-mesenteric or ilio-mesenteric bypass, thrombectomy, intimectomywith or without patch angioplasty, ligation, and resection [13-15]. These surgical procedures have been reported to provide good short-term results.

Endovascular stent placement has also been successful for treatment of SMA dissection. Leung et al. [16] performed the first stent placement for treating SMA dissection in 2000. Since then, percutaneous endovascular therapy has been accepted as a less invasive alternative to open surgical revascularization [17,18]. Most reports of endovascular therapy use a Wallstent. In case 1, the patient's symptoms persisted despite anticoagulation, and to stop further dissection and prevent bowel ischemia we choose percutaneous stent implantation instead of open surgical intervention. We choose balloon-expandable stent instead of a Wallstent because of some important characteristics including minimal shortening, relatively good flexibility, and lack of migration despite continuous mesenteric motion. Stenting of the dissected main trunk to achieve complete coverage of the entry site without loss of major side branches was performed successfully, and resulted in complete resolution of his symptoms.

In summary, SMA dissection should be suspected in patients presenting with abdominal pain. There is no consensus on the best treatment of spontaneous isolated dissection of the SMA. Medical management with anticoagulation and supportive care may be a first line treatment if there is no evidence of bowel necrosis, but close follow-up is mandatory. Surgery is indicated if mesenteric ischemia or peritonitis develops. Although we think percutaneous endovascular stent placement is feasible in patients without peritonitis or mesenteric ischemia, long-term results require evaluation.

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