Isolated superior mesenteric artery dissection: An unusual presentation quashed by an unusual approach

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Dear Editor,

We are highlighting a case of the superior mesenteric artery (SMA) dissection with an unusual initial presentation of severe back pain and a novel endovascular approach used for revascularization and stenting.

A 54-year-old male presented to the emergency room for the evaluation of sudden-onset severe back pain in the T12 and L1 region, followed by mild abdominal pain associated with nausea and nonbilious vomiting. There was no associated diarrhea, dysphagia, chest pain, shortness of breath, urinary, or other bowel symptoms. His past medical history was significant for coronary artery disease with a drug-eluting stent in the left anterior descending artery, hypertension, and diabetes mellitus. He was on dual antiplatelet and was taking insulin for his diabetes.

Pertinent vitals included a temperature of 99.0°F, a regular heart rate of 102 beats per minute, respiratory rate of 16/min, and blood pressure of 180/100 mmHg. Physical examination revealed that the patient felt uncomfortable, moaning due to severe back pain. His back was non-tender to touch, and there was no limitation of movements. Abdominal examination revealed mild tenderness in epigastric region without peritoneal signs. The chest was clear to auscultation, and there were no significant findings on cardiovascular and central nervous system examination.

Laboratory studies revealed a slightly raised white blood cells count (WBC) of 12,100/mcL, decreased hemoglobin of 9.6 mg/dL, and normal platelet count of 5,400. The metabolic profile was within normal limits with the urea of 11 mg/dL, creatinine of 0.67mg/dL, sodium 136 mEq/L, and potassium 3.7 mEq/L. The patient's D dimer levels were within normal limits. Serum lipase, lactic acid, and liver function tests were also in the normal range. His electrocardiogram (ECG) showed no significant new changes, and there was sinus tachycardia, left axis deviation, and right bundle branch block with old signs of the septal infarct. Abdominal, lumbosacral, and chest x-ray were done, which were normal, and so was the ultrasound of the abdomen and pelvis, which revealed no positive findings.

On day 2 of admission, the patient had more severe abdominal pain, generalized and non-radiating. The WBC count raised up to 17,000, and the lactic acid increased to 2.6. Repeat chest x-ray, ECG, and abdominal x-ray were within normal limits. A computerized tomography (CT) scan of the abdomen/pelvis with contrast was performed initially, which showed isolated SMA dissection and a thrombus in the vessel (Figure 1). The sagittal view of the abdominal CT scan showed absent blood flow in branched vessels of SMA (Figure 2).

Initially, the patient was started on conservative treatment including intravenous fluids, analgesics, and intravenous heparin. He was kept nil per oral, but due to his history of coronary artery disease, and the antiplatelet and other oral medications were continued. Intravenous heparin was also continued on the following day along with lisinopril for hypertension and omeprazole for stress ulcer prophylaxis. His worsening abdominal pain, rising WBC, and up-trending lactic acid on the following day prompted us toward urgent interventional management. The gastroenterologist and surgical team was aboard and decided to have an aortogram. The primary concern was acute mesenteric ischemia, for which the patient underwent a selective SMA arteriography, which revealed a complete (100%) SMA occlusion with proximal intimal dissection and normal celiac axis (Figure 3). These findings were consistent with the findings of CT angiography.

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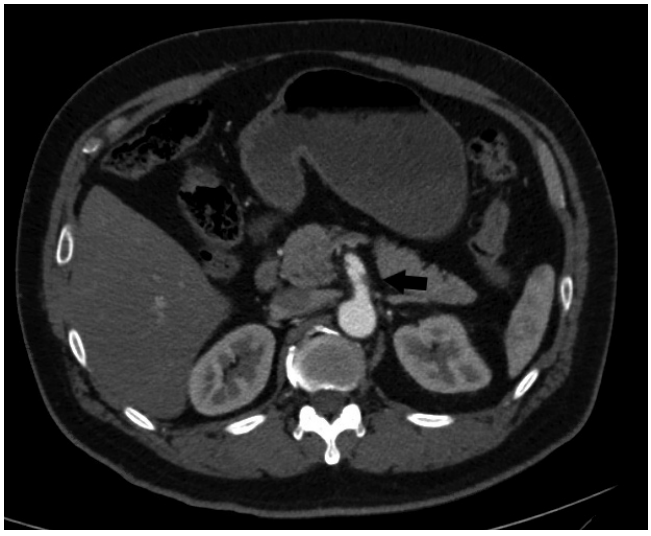

Figure 1. Axial view showing the SMA dissection with no evidence of aortic involvement. The black arrowhead is showing the thrombus in the SMA

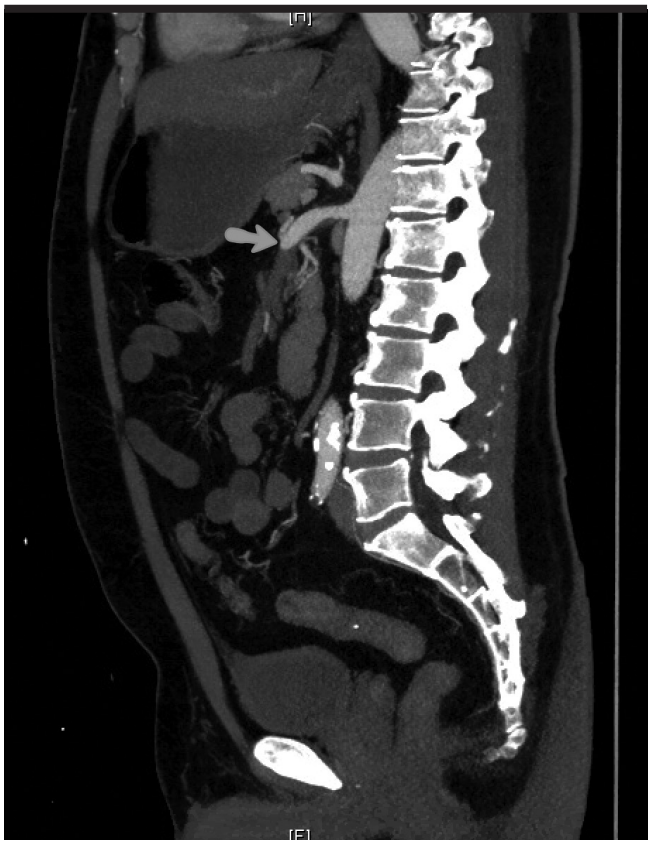

Figure 2. Sagittal view of the SMA dissection with sharp demarcation and no flow in distal vessels (arrowhead). No evidence of aortic dissection

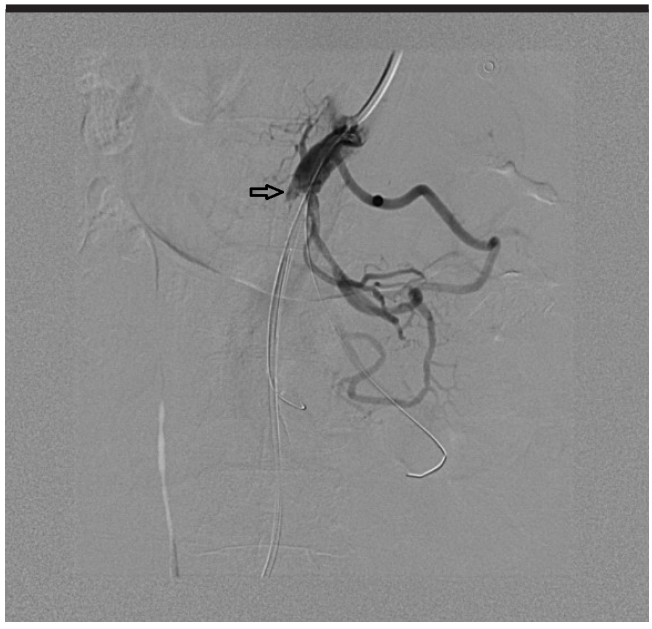

Figure 3. Arteriography demonstrating a probe in the SMA with no blood flow (arrowhead). Adequate blood flow can be seen in inferior and celiac arteries.

Initially, the femoral artery approach for the SMA dissection stenting was attempted multiple times, but every time, the probe went into the false lumen of dissection as it was directed distally toward the descending aorta. The interventional cardiologist was taken aboard, and it was decided to approach the SMA through right radial artery, which turned out to be successful on the very first attempt. During the procedure, an Ever-flex stent of 8x4 and 6x6 mm in size was placed (Figure 4). There was an instant restoration of brisk blood flow to a sizeable segment of the SMA system (Figure 5). The patient tolerated the procedure well with resolution of abdominal pain, as well as back pain, and was discharged on home medications along with warfarin. He was advised to have a close follow-up and keep the target international normalization ratio of 2-3. At a follow-up visit after 6 weeks, he was vitally stable and denied any complications or symptoms.

Arterial dissection was initially explained by Watson et al. in 1956 as a condition resulting from the split between the vessel coats such as medial laminae and adventitia, with or without a tear of the tunica intima (inner vessel layer) (1). However, the SMA dissection was first reported way before that by Bauersfeld in 1947 as an incidental autopsy finding in a patient who died of multiple vessels aneurysms (2). Since then, there was a gradual increase in

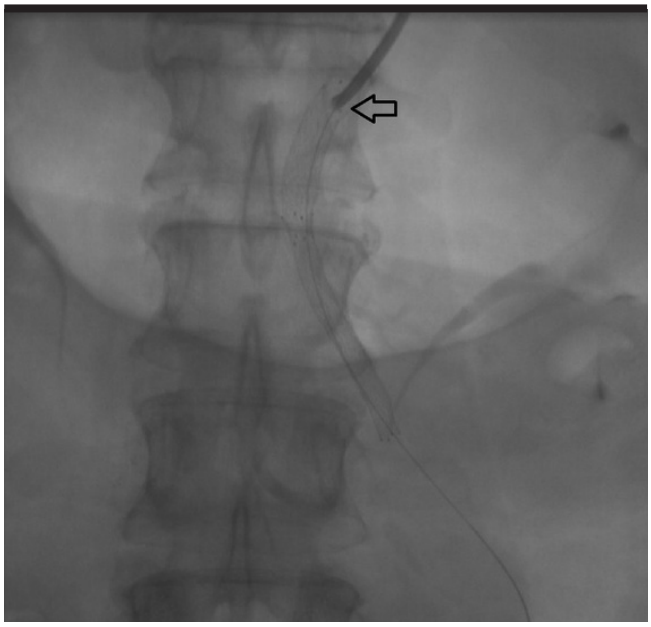

Figure 4. Arteriography showing stent placement with no distal flow (arrowhead)

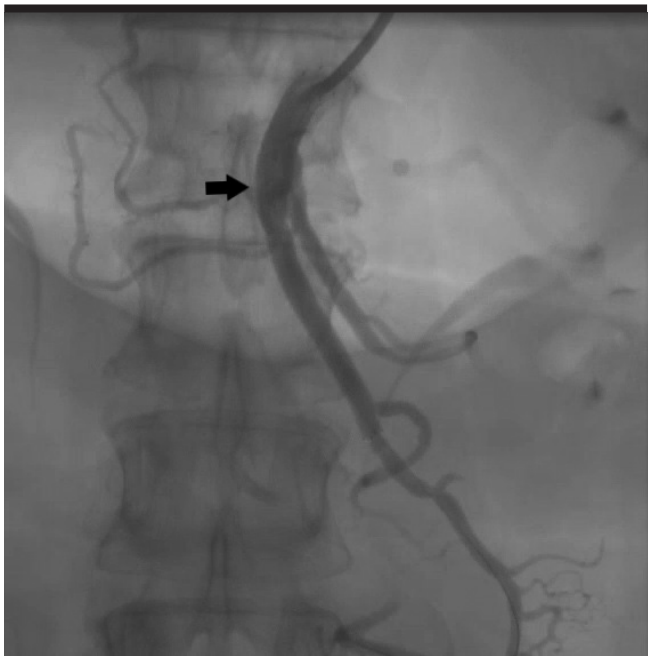

Figure 5. Arteriography showing successful revascularization with restoration of the distal blood flow (arrowhead)

SMA-dissection-related deaths, and about 11 more cases were found on autopsy findings till 1972. The story of a fatal SMA dissection did not stop here, and there was a continuous rise in the incidence and complications of the SMA dissection (3).

This alarming increase in the incidence of the SMA-related death can be attributed to many factors. One of the reasons is the non-specific clinical presentation of the SMA dissection, such as vague generalized abdominal pain or pain mostly in the epigastric and periumbilical regions with no diagnostic clinical signs and insufficient data on the diagnostic and management criteria of SMA (4). Our case was unique as the patient presented with back pain initially, and hence the SMA dissection was the least of the possibilities to consider. Although back pain has been the presenting complaint of the SMA dissection in many cases, our patient did not have other symptoms, and the abdominal pain was very mild to raise the suspicion of the SMA dissection. It mostly presents with severe abdominal pain. A study of 721 patients done by Kimura et al. (5) in 2017 revealed that 86% cases of the SMA dissection presented with abdominal pain. Hence, back pain, although not very rare, can be considered as a unique presentation of the SMA dissection. Here we want to emphasize that physicians should consider the SMA dissection as a possible cause of intractable back pain, especially when the patient has a history of other vasculopathies, like coronary artery disease, diabetes, and hypertension.

Laboratory studies and an abdominal x-ray have no role in the diagnosis of the SMA dissection. Other radiological imaging like ultrasound can be suggestive in selective cases, in cases where there is no thrombus in the false lumen to obscure the dissection. CT angiogram and arteriography are the diagnostic modalities of choice for the SMA dissection (6). We believe from the results of our case that the CT angiogram has the same results as conventional arteriography with the benefits of a decreased hospital stay, lower chances of bleeding, and limited radiation exposure associated with the CT angiogram. It also provides a three-dimensional view of the gut, luminal borders, and extraluminal organs, and it can be performed more quickly compared to conventional arteriography. Based on the imaging appearance, Sakamoto has classified the SMA dissection into the following types: (7) According to the CT scan findings of our patient, he was classified as type IV SMA dissection.

There are three management options for the SMA dissection, with conservative being the most commonly and initially used approach, provided the patient is stable. Other managements include an endovascular approach for stenting with or without balloon angioplasty and surgical management, reserved mostly for complicated cases like bowel infarction or widespread bowel ischemia (4). It

can also be considered when other treatment modalities fail. There should be a regular follow-up of such patients, mostly in cases who had conservative management to monitor the size and complications of the SMA dissection (4). The anticoagulant therapy is controversial but can be continued for at least a year in high-risk patients (8). Our case is unique in the management aspect as the stent was placed via the radial artery approach instead of the conventionally used femoral artery approach, as demonstrated in many studies almost all patients underwent stent placement via femoral approach (5,9). We, however, advocate that in difficult cases, the radial approach can be considered as an alternative. More studies are needed to establish the safety of this technique.

Informed Consent: Informed consent was obtained from the patient who participated in this study.

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