Spontaneous Dissection of the Superior Mesenteric Artery

Patrick J. Sheldon, James B. Esther, Elana L. Sheldon, Steven R. Sparks, David P. Brophy, Steven B. Oglevie

1Department of Radiology, University of California San Diego Medical Center, 200 West Arbor Drive, San Diego, CA 92103, USA
2Department of Radiology, Beth Israel Deaconess Medical Center, Harvard Medical School, West Campus, CC308E, One Deaconess Road, Boston, MA 02215, USA
3Department of Medicine, University of California San Diego Medical Center, 200 West Arbor Drive, San Diego, CA 92103, USA
4Department of Surgery, University of California San Diego Medical Center, 200 West Arbor Drive, San Diego, CA 92103, USA
5Department of Radiology, VA San Diego Healthcare System, 3350 La Jolla Village Drive, San Diego, CA 92161, USA

Abstract

Spontaneous dissection of the superior mesenteric artery (SMA) is a rare occurrence, especially when not associated with aortic dissection [1]. Currently, only 28 cases appear to have been reported. Due to the scarcity of cases in the literature, the natural history of isolated, spontaneous SMA dissection is unclear. CT has been reported to be useful for the initial diagnosis of SMA dissection [2–5]. We present two recent cases of spontaneous SMA dissection in which enhanced spiral CT was instrumental in following the disease process and guiding clinical decision making.

Case Reports

Case 1

A 41-year-old man presented with a 3-day history of severe epigastric pain. Previous medical history was significant for hypertension and Raynaud’s syndrome. He was taking no medications and he denied any history of recent trauma. His physical examination was unremarkable except for tenderness to palpation over the epigastrium.

An abdominal triphasic spiral CT angiogram was performed, revealing an SMA dissection (Figs. 1A, B). An abdominal aortogram revealed an isolated dissection of the SMA beginning about 1.5 cm distal to the ostium and extending for at least 5 cm, with the distal extent difficult to identify (Figs. 1C, D).

Over the next 2 days, the patient’s symptoms resolved completely; therefore, no immediate repair was undertaken. The patient was anticoagulated with coumadin and followed with triphasic CT angiograms at 2 weeks, 2 months, 4 months, and 9 months after initial presentation.

Each imaging study revealed gradual and progressive worsening of the dissection. By 9 months after his initial presentation, there had been a 46% increase of the false lumen diameter and a 33% decrease of the true lumen diameter compared to his initial study (Fig. 1E).

The patient denied any symptoms until his 9-month visit, when he complained of one to two episodes per week of cramping abdominal pain occasionally exacerbated by eating. Because of the progression of disease demonstrated on CT, in combination with the patient’s abdominal symptoms, surgical repair was undertaken. Operative findings revealed six branch vessels originating from the true lumen and eight from the false lumen.

The patient had an uneventful recovery and was discharged home 6 days later. He has remained free of abdominal pain for 22 months after the operation.

Case 2

A 46-year-old man with no previous medical history and no history of trauma presented with progressive postprandial abdominal pain over a 24-hr period. An abdominal bruit was the only finding on physical examination. A triphasic spiral CT angiogram demonstrated dissection of the SMA approximately 3 cm from its origin with thrombosis of the false lumen and narrowing of the true lumen (Figs. 2A, D).

A conservative course of management with coumadin was chosen due to the patient’s benign physical exam and spontaneous resolution of symptoms while in the hospital. The patient was discharged home and remained asymptomatic on a regular diet.

A follow-up triphasic CT angiogram at 12 days after initial presentation demonstrated both retrograde and antegrade progression of the dissection, with involvement of multiple jejunal branch origins (Figs. 2B, E, F). A follow-up CT angiogram at 11 months after initial presentation revealed a decrease in overall vessel diameter and in the false lumen diameter with decreased compression of the true lumen (Fig. 2C). The patient has remained asymptomatic on coumadin therapy for 17 months after his initial presentation.

Discussion

Bauersfeld [6] first described dissection of the SMA in 1947 in a series of patients with aortic dissection. As demonstrated in our two cases, when isolated to the SMA, dissection usually begins 1.5–3 cm from the orifice of the SMA, thereby sparing the origin of the artery. This segment of the SMA corresponds to the retropancreatic portion that is fixed in position. The more distal artery is relatively mobile and pivots with changes in bowel position, which may transmit a sheering force to the retropancreatic portion of the SMA [7].

The etiology of spontaneous SMA dissection in most reported cases and in our two cases is unknown. Some investigators, however, have noted a relation with iatrogenic or blunt trauma [8],...
hypertension [8], cystic medial necrosis [9], fibromuscular dysplasia [10], and atherosclerosis [11].

In most cases of SMA dissection, patients present in one of two ways: (1) with vague abdominal pain due to stenosis of the true lumen by dilatation of the false lumen causing mesenteric ischemia, or (2) with profound shock after rupture of the dissection. They often have a paucity of objective findings on physical examination, although an epigastric bruit may be heard, as in our second case [12].

SMA dissection can often be accurately diagnosed non-invasively using enhanced spiral CT [2–5]. As further illustrated by our two cases, the use of CT to follow interval progression of the disease process may be extremely helpful in clinical decision making. In the first case, the significantly reduced diameter of the true lumen in combination with the patient’s worsening symptoms prompted surgical treatment. In the second case, the diminished compression of the true lumen along with the patient’s continued lack of symptoms have allowed for more conservative management with anticoagulation and observation.

Given the scarcity of cases in the literature, the natural history of spontaneous, isolated SMA dissection is not predictable. While angiography is superior to enhanced CT in evaluating collateral flow and the relationship of the dissection to branch vessels, the cases presented here demonstrate the utility of enhanced spiral CT for initial diagnosis and follow-up of interval changes of SMA dissection. In both cases, the use of this non-invasive modality was critical in determining appropriate treatment options.

References