

Spontaneous and Isolated Dissection of the Main Trunk of the Superior Mesenteric Artery

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A 42-year-old man was admitted to another hospital complaining of acute abdominal pain that was induced by eating. Abdominal computed tomography and selective angiography revealed an intimal flap separating true and false lumens that was located 3 cm from the origin of the superior mesenteric artery (SMA). Emergency surgery was performed because of the sudden recurrence of diffuse abdominal pain after eating and abdominal aorta-SMA bypass grafting was done using a radial artery graft. Postoperative angiography revealed that the graft showed good patency. The postoperative course was uneventful and abdominal pain no longer occurred after eating. This excellent result was achieved by early diagnosis using CT scanning and angiography plus an aggressive surgical repair with a radial artery bypass graft for isolated dissection of the superior mesenteric artery. (Ann Thorac Cardiovasc Surg 2002; 8: 236–40)

Key words: dissection of the superior mesenteric artery (SMA), mesenteric ischemia, bypass surgery, radial artery

Introduction

Acute mesenteric ischemia caused by spontaneous and isolated dissection of the main trunk of the superior mesenteric artery (SMA) without aortic involvement is a rare event. Despite this, it is important to make an early diagnosis because of the high risk of death. We report the first case of successful radial artery bypass grafting for isolated dissection of the SMA.

Case Report

A 42-year-old man was admitted to another hospital with the acute onset of abdominal pain induced by eating. His condition became stable and a regular diet, commenced after seven days of conservative therapy, did not induce any symptoms. However, SMA stenosis was detected by

abdominal computed tomography (CT) and he was referred to our hospital for further evaluation of abdominal angina. He had a history of hypertension and asthma and had smoked two packs of cigarettes daily for the previous 20 years. Abdominal CT scans revealed an intimal flap separating the true and false lumens of the SMA at 3 cm from the origin as well as thrombosis in the peripheral false lumen (Fig. 1). Three-dimensional CT (3DCT) scanning and selective angiography confirmed dissection of the SMA trunk and showed that the true lumen was compressed by the false lumen and the thrombus in the false lumen (Fig. 2). Aortography revealed no abnormalities in the abdominal aorta, the celiac axis, or the inferior mesenteric artery. On the second day after admission, emergency surgery was done because of the sudden recurrence of diffuse abdominal pain after eating. The operation was performed through a midline abdominal incision. At laparotomy, there were no signs of ischemic colitis or peritoneal irritation. The SMA was approached through the mesentery of the transverse colon and was dissected under the body of the pancreas to its origin. The main trunk of the SMA was slightly dilated without any inflammatory changes. Abdominal aorta-SMA bypass grafting was done using a radial artery graft. After

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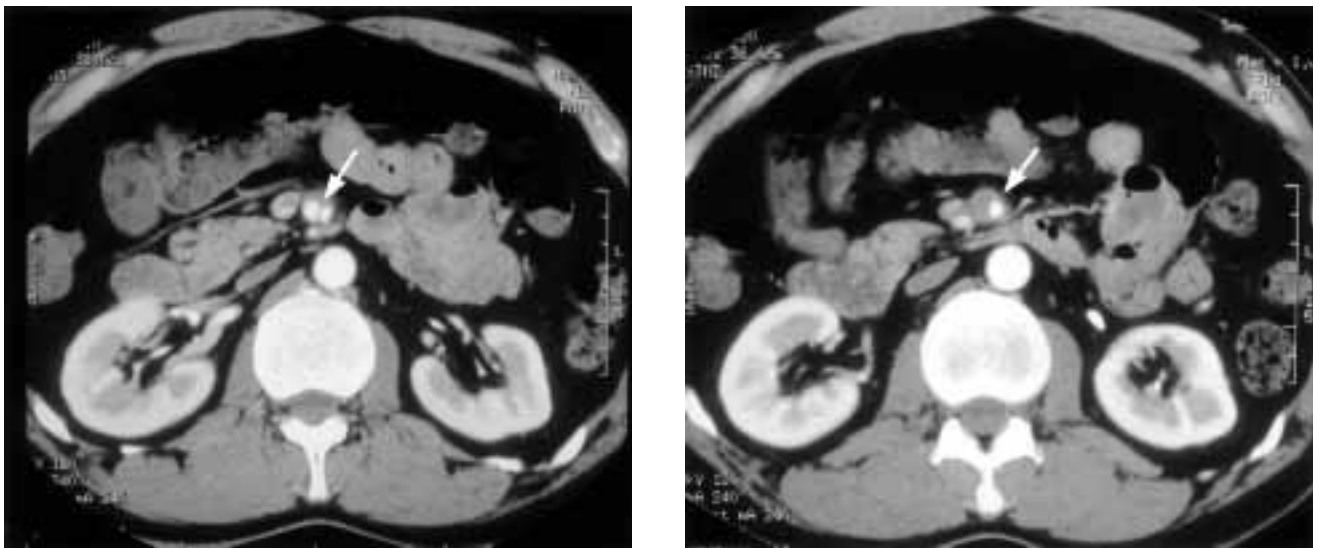


Fig. 1. Abdominal CT scans revealed an intimal flap separating the true and false lumens of the SMA 3 cm from its origin (a) as well as thrombosis in the peripheral false lumen (b).

a | b



Fig. 2. 3DCT scanning (a) and selective angiography (b) confirmed dissection of the SMA trunk and showed that the true lumen was compressed by the false lumen and the thrombus in the false lumen.

a | b

grafting, excellent pulses were present in the branches of the SMA. Postoperative angiography revealed that the bypass graft showed good patency (Fig. 3). The postoperative course was uneventful and abdominal pain no longer occurred after eating.

Discussion

Spontaneous and isolated dissection of the main trunk of the SMA without aortic involvement is rare. The first case

was reported by Bauersfeld in 1947.¹⁾ Since then, to our knowledge, only 36 cases of spontaneous and isolated SMA dissection have been reported, including our case (Table 1). Although the etiologic factors of SMA dissection are thought to include trauma, atherosclerosis, fibrodysplasia, and congenital connective tissue disorders, the definite cause is not known.⁹⁾ Although our case was also possibly attributable to atherosclerosis because of his history of hypertension and the operative findings, a definite cause was unclear because no tissue was resected

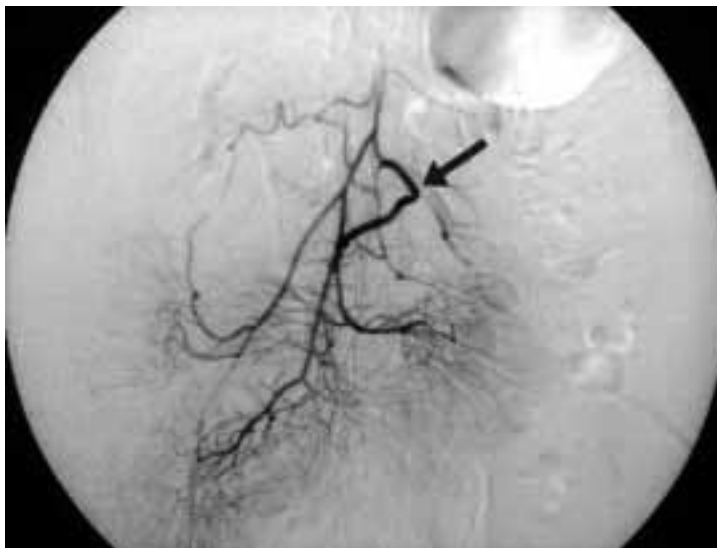


Fig. 3. Postoperative angiography of the radial artery bypass graft revealed good patency (arrow).

Table 1. Summary of reported cases of spontaneous dissection of the main trunk of the SMA

Case (year)	Age/sex	Surgical procedure	Bowel infarction	Death
1) Bauersfeld (1947) ¹	87/F	–	+	+
2) Foord (1959) ²	58/M	–	–	+
3) Foord (1959) ²	55/M	–	+	+
4) Foord (1959) ²	73/F	–	Unknown	+
5) Ralston (1960) ³	51/M	–	–	+
6) Jean (1961) ⁴	53/M	Drainage	–	+
7) Clark (1962) ⁵	51/M	–	+	+
8) Ramchand (1969) ⁶	68/F	–	+	+
9) Boquist (1970) ⁷	52/F	–	–	+
10) Lee (1971) ⁸	62/M	–	–	+
11) Guthrie (1972) ⁹	70/F	–	–	+
12) Sisteron (1975) ¹⁰	–	Venous graft	–	–
13) Rignault (1976) ¹¹	50/M	SMA transposition	–	–
14) Krupski (1985) ¹²	51/F	Intimectomy + venous patchplasty	–	–
15) Takehara (1988) ¹³	50/M	Aortomesenteric bypass	–	–
16) Corbetti (1989) ¹⁴	62/M	Resection	–	–
17) Koto (1989) ¹⁵	53/M	Aortomesenteric bypass	–	–
18) Cormier (1992) ¹⁶	60/M	SMA venous bypass	–	–
19) Cormier (1992) ¹⁶	41/M	Endoaneurysmorrhaphy	–	–
20) Cormier (1992) ¹⁶	52/M	Aortomesenteric bypass	–	–
21) Cormier (1992) ¹⁶	50/M	Intimectomy + prosthetic patchplasty	–	–
22) Vignati (1992) ¹⁷	50/M	Right gastroepiploic artery to mesenteric bypass	–	–
23) Solis (1993) ¹⁸	45/F	Intimectomy	–	–
24) Ambo (1994) ¹⁹	56/M	–	–	–
25) Ando (1995) ²⁰	47/M	Aortomesenteric bypass	–	–
26) Hyodoh (1996) ²¹	66/M	–	–	–
27) Murata (1997) ²²	47/M	Aortomesenteric bypass	+	–
28) Murata (1997) ²²	64/M	Resection + prosthetic interpose	–	–
29) Murata (1997) ²²	70/M	Venous patchplasty	–	–
30) Nakamura (1997) ²³	44/M	–	–	–
31) Yasuhara (1998) ²⁴	55/M	–	–	–
32) Yasuhara (1998) ²⁴	45/M	–	–	–
33) Barmeir (1998) ²⁵	48/M	Thrombectomy	–	–
34) Dushnitsky (1998) ²⁶	58/M	–	–	–
35) Iha (2000) ²⁷	46/M	Aortomesenteric bypass	–	–
36) Hirai (2002)	42/M	Aortomesenteric bypass	–	–

for pathological examination. The SMA dissection was located 3 cm from the origin in our patient. Solis et al. reported that the dissection begins 1.5 to 3 cm from the origin of the SMA as in our case, sparing the origin of the artery. Because this segment of the SMA corresponds to the exit of the artery from the pancreas, it may be the site of acute or chronic sheer stress analogous to that resulting in aortic dissection at the ligamentum arteriosum. The clinical features of this disease are abdominal symptoms due to acute or chronic mesenteric ischemia, which is sometimes related to food intake. Most patients who have SMA dissection present with epigastric pain of sudden onset associated with nausea and vomiting. It is important to make an early diagnosis in consideration of the high risk of death. In our case, abdominal CT and 3DCT were useful diagnostic examinations for detecting SMA dissection with mural thrombus.

Over the previous 55 years, there have been reports on 28 men and 7 women (one unknown) with a mean age of 55.2 years. In 10 of the 16 patients who were treated conservatively, death was the result of bowel infarction (n=4), intraabdominal hemorrhage (n=3), uremia (n=2), and myocardial infarction (n=1). Although there were six patients with transient symptoms who made a full recovery after conservative therapy, it must be emphasized that surgical repair is recommended because of the high mortality rate. The first case of surgical repair using a venous graft was reported by Sisteron et al. in 1975.¹⁰ Since then, all of the 19 patients undergoing surgical repair have had a good outcome. The strategy of surgical repair for SMA dissection is not well established. Many surgical procedures have been reported, including aorto-SMA bypass using either a saphenous vein graft or a Dacron graft and right gastroepiploic artery-SMA bypass, as well as intimestomy, endoaneurysmorrhaphy, and thrombectomy. We used the radial artery as a novel conduit for bypass from the aorta to the SMA. This vessel was chosen because of its size and its known use as a satisfactory conduit for coronary artery bypass. This is the first case of successful radial artery bypass grafting for isolated SMA dissection. The functional result has been excellent, although the long-term patency is still unknown.

Conclusion

We reported a 43-year-old man with spontaneous and isolated dissection of the main trunk of the SMA. An excellent result was achieved by early diagnosis using CT scan-

ning and angiography plus aggressive surgical repair with a radial artery graft.

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