CASE REPORT

Spontaneous Isolated Dissection of the Superior Mesenteric Artery

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Introduction

Dissection of superior mesenteric artery (DSMA) in most cases extends from an aortic dissection. It is a major cause of death when it compromises the intestinal blood supply. Occasional cases of DSMA have been reported since the initial description of Bauersfeld in 1947. Due to this rarity, clinical presentation, treatment and outcome modalities are not well defined.

Between 1999 and 2001, three patients were referred to our department with DSMA. This led us to report our experience, with a literature review.

Case Reports

Patient 1

A 51-year-old caucasian man was admitted to another centre with sudden onset of abdominal pain and signs of small bowel obstruction. He had no significant past history, except for hypertension and smoking. A CT scan with contrast then an angiogram showed a DSMA and a stenosis of the coeliac artery. The patient was treated conservatively. His symptoms improved at first but eight days later he developed excruciating abdominal pain and was referred to our unit with suspected acute mesenteric ischaemia.

A new angiogram showed that SMA had occluded. A thrombolysis catheter was placed in the SMA and a bolus of 10 mg of rTpa was injected into the clot followed by a continuous in situ perfusion of 1 mg/h of rTpa. After four hours a new angiogram showed that small intestinal branches were cleared of clots but that the main SMA trunk remained occluded.

A laparotomy was performed which showed an extensive necrosis of the small bowel. Four metres of small bowel were resected and a jejunostomy was performed. A second look was performed 24 hours later which confirmed the viability of the remaining intestinal loops.

Two and a half months after the hospital discharge the patient was well. A new angiogram was performed in order to assess bowel blood supply before restoring the continuity of the intestinal tract. The stenosis of coeliac trunk was successfully treated by angioplasty and stenting and restoration of continuity of gastrointestinal tract was then performed uneventfully. Two and a half years after the acute episode, the patient is alive and symptom-free. A duplex scan shows a good patency of the stented coeliac trunk.

Patient 2

A 61-year-old woman was admitted with transient abdominal pains and vomiting. She had no previous medical history apart from hypertension. She had neither weight loss, nor past history of abdominal trauma. On physical examination, tenderness and a systolic bruit were found in the epigastric area. Duplex scan was not contributive. CT scan showed a dissection of the superior mesenteric artery, with a normal aorta (Fig. 1). A selective angiogram showed the dissection flap starting 3 cm above the origin of the SMA and extended downwards for 8 cm. The abdominal aorta, coeliac trunk, renal and iliac arteries were normal.

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The origin of the SMA was approached through a midline abdominal incision and an interduodenopancreatic exposure. The main trunk and SMA tributaries were dissected free relatively easily despite some inflammation. After clamping, the SMA was opened for 10 cm down to the ileo-colic artery. The false lumen was filled with thrombus. The flap was completely resected and the thrombus removed. The arteriotomy was closed with a polyurethane patch (Braun Aesculap, Tuttlingen, Germany). The postoperative course was uneventful, apart from transient diarrhoea. On the 6th postoperative day, a selective angiogram showed that the SMA was fully patent with loss of one major branch. Nevertheless, the collateral pathway was sufficient to fill the intestinal branches distally. Five months after surgery, the patient remains symptom-free.

Patient 3

A 68-year-old man was referred to our unit for an asymptomatic dissecting aneurysm of the SMA. His past history included hypertension for 10 years, dyslipidaemia and a skin melanoma of left thoracic area treated by skin resection. A CT scan of the abdomen, which was performed to survey the melanoma extent, showed a dissecting aneurysm of the superior mesenteric artery (Fig. 2). No past history of trauma or abdominal symptoms was found. An angiogram (Fig. 3a), showed a 4-cm-long dissection within a considerably enlarged superior mesenteric artery (30 × 27 mm in diameter). The flap originated 1 cm distal to the SMA ostium. The right superior colonic artery arose from the false lumen while the ileo-jejunal arteries arose from the posterior lumen.

Due to size of aneurysm and risk of rupture or thrombosis of the SMA, a surgical repair was undertaken. Through a midline abdominal incision, the main trunk of the SMA was dissected free from its origin to the ileo-colic artery. All branches were controlled. The flap was resected as well as excess of arterial wall, while the ostium of jejuno-ileal arteries was respected. The arteriotomy was closed with a polyurethane patch (Braun Aesculap, Tuttlingen, Germany). The postoperative course was uneventful. Before hospital discharge a selective SMA angiogram was performed, showing an excellent patency of superior mesenteric artery (Fig. 3b). Six months after surgery, the patient is alive, symptom-free with a normal duplex scan.

Discussion

Contrary to aortic dissection, which extends into the visceral arteries, DSMA is a rare entity. We were able to find only 35 previously reported cases in the literature, giving a total of 38 patients, including our own. They were 30 men and six women (2 cases
non-available) with a mean age of 55.3 years old (range 44–87).

Congenital connective tissue disorders, fibromuscular dysplasia, cystic medial necrosis and abdominal trauma were rarely found though. Hypertension and atherosclerosis were not uncommon, but it still remains unknown whether they are a cause per se or associated risk factors. In 20 cases the location of the dissection was described. It was located in the proximal part of the SMA within the first centimetre in 4 cases (patient 3), and between 1.5 and 3 cm in 15 cases (patient 2), and after 4 cm in one case. Solis hypothesised that the dissection was caused by the stress on the arterial wall at the inferior edge of the pancreas, where the transition from the fixed and to the mobile part of the SAM takes place. Anatomical features included 24 “dissecting aneurysms” and 14 isolated flaps without arterial enlargement (patients 1 and 2).

The presenting symptoms of DSMA are listed in Table 1. Of note is that abdominal pain may be caused by the dissection, and/or by intestinal ischaemia, and/or by small bowel occlusion which may interfere with the choice of treatment. A systolic epigastric bruit was mentioned in only 6 cases (patient 2). DSMA was diagnosed at autopsy in 4 cases and during laparotomy in two cases. No previous imaging had been performed in those patients.

Twenty-eight patients (87.5%) had an angiogram pre-operatively (patients 1, 2, 3). Typical features of dissection of the SMA and/or dissection aneurysm were observed in 25 cases (89.3%) (patients 1, 2, 3). In four cases the diagnosis of dissection was missed because of an occlusion of the SMA in two and an isolated aneurysm of the SMA in two patients. The final diagnosis was made on pathological examination in one and on a new angiogram in another.

CT scan was performed in 24 cases (patients 1, 2, 3) which showed typical aspects of DSMA and/or dissection aneurysm in 19 cases (79.16%) (patients 1, 2, 3). It was normal in three cases. In one case, CT scan showed a 90% stenosis of the SMA associated with signs of small bowel ischaemia. In the remaining case, the authors described an image of “an opaque mass located anteriorly in the proximal segment of the SMA” without another precision. The two imaging modalities (CT scan and angiogram) seem complementary for the diagnosis of DSMA, especially when one of these exams is doubtful.

Due to its rarity and short-term follow-up, the outcome of the DSMA is poorly documented. The six earlier cases, reported between 1947 and 1975, died of mesenteric infarction or aneurysmal rupture. Eleven patients (34.37%) (patient 1) were treated conservatively. Two of them received anticoagulant therapy (heparin or Coumadin). Three (27.27%) of them were latterly treated by SMA stenting, thrombolysis and intestinal resection.
(patient 1), aneurysmal resection.26 These three patients were alive and symptom-free after a follow-up extending from 6 months to 2.5 years. The remaining 8 cases treated conservatively remained asymptomatic, with a follow-up from 3 months to 11 years. In four21,23,24 cases, CT scan and/or sonography were obtained showing spontaneous lysis of a thrombus in two,21,23 arterial enlargement in one, 23 and no further change in one.24

Twenty-one patients were operated on. The techniques used, clinical outcome, length of follow-up and patency assessment are summarised in Table 2. There were no postoperative deaths. Transient postoperative diarrhoea was mentioned in 5 cases9,15,16,31 (patient 2). The mean follow-up of the 22 operated patients was 15.3 months (range 1 to 48 months). SMA lasting patency was assessed by angiography in 12 cases9–10,13,15–17,19,27,28 (patients 2 and 3), sonography in 9 cases15,16,18,21,24,26,28,29 and CT scan in 5 cases.21–23,32

In conclusion, our own cases and the literature analysis showed that SDMA is a hazardous condition, which may worsen despite early favourable outcome in patients treated conservatively. Since the results of surgery are excellent, open repair seems to be the safest option to treat these patients. However, longer follow-ups with adequate imaging are necessary to draw firm conclusions.

### References

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