Lifesaving Treatment of Acute Stanford B Aortic Dissection Complicated by Intestinal Ischemia with Stent Placement in the Superior Mesenteric Artery: A Case Report

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A 44-year-old man was transported to our hospital with chief complaints of back pain and paralysis of the leg. Contrast-enhanced computed tomography (CT) imaging revealed an acute Stanford B aortic dissection (AD), which was complicated by acute arterial occlusion of the left external iliac artery. The patient was treated by femorofemoral crossover bypass. Thereafter, abdominal pain was noted, and the patient was diagnosed with intestinal ischemia due to occlusion of the celiac artery and superior mesenteric artery (SMA). A stent was emergently placed into SMA. Subsequently, the patient demonstrated good postoperative progress and was discharged on hospital day 27.

Keywords: acute Stanford B aortic dissection, SMA stent, malperfusion

Introduction

Acute Stanford B aortic dissection (AD) is complicated by intestinal ischemia in approximately 5% of cases, and it has a poor prognosis, with a mortality rate of 36%–90%.

Here, we report on a case in which the patient first suffered a Stanford B acute AD, which was complicated by ischemia of the lower limbs, followed by intestinal ischemia as a result of stenosis of the true lumen. The patient underwent lifesaving femorofemoral crossover bypass and stent placement in the superior mesenteric artery (SMA).

Case Report

The patient was a 44-year-old man with untreated hypertension. He was transported to our hospital by an ambulance with chief complaints of sudden onset of back pain and paralysis of the left lower limb.

Pallor of the left lower limb was noted, and no pulse could be palpated from the femoral artery to the periphery. Acute Stanford B AD was diagnosed on contrast-enhanced computed tomography (CT). A false lumen was seen to be compressing the true lumen and occluding the celiac artery which was perfused from the false lumen, and contrast barely reached SMA which was perfused from the true and false lumen. The inferior mesenteric artery was perfused from the false lumen. The left external iliac artery was also occluded (Fig. 1).

Due to the complication of malperfusion of the left lower limb, emergency femorofemoral crossover bypass was performed. Thereafter, there was favorable blood flow in the left lower limb, the foot pulses were easily palpable, and the paralysis disappeared.

Twelve hours later, the patient experienced sudden onset of abdominal pain, with lactic acid and transaminases levels found to be elevated. On the basis of the contrast-enhanced CT findings at the time of admission, it was believed that the patient was suffering from concomitant intestinal ischemia, and emergency aortography using a left brachial artery approach was performed. When contrast passed into the descending aorta, there was no enhancement of the celiac artery or SMA, and only the bilateral renal arteries were visible. Intravascular ultrasound (IVUS) was used to confirm that a catheter had entered the true lumen, and we could pass from SMA into the true lumen while advancing a guide wire. A stent (S.M.A.R.T., Cordis Corporation, Bridgewater, NJ, USA)
**Fig. 1** Preoperative CT angiography images showing type B aortic dissection (A–F). A false lumen was seen to be compressing the true lumen, and occluding the celiac artery (C), and contrast barely reached SMA (D, E). The left external iliac artery was occluded (F). CT: computed tomography; SMA: superior mesenteric artery

**Fig. 2** Intraoperative digital subtraction angiography images, there was no enhancement of the celiac artery or SMA, and only the bilateral renal arteries were visible. (A) Contrast passed from the descending aorta into SMA, and (B) branches of the celiac artery were also contrasted through a collateral source. SMA: superior mesenteric artery
In the present case, the CT scan at the time of admission showed obstruction of the celiac artery and stenosis of SMA. Therefore, intestinal ischemia was already suspected by the time abdominal pain was observed, and the patient was taken to the catheter laboratory, diagnosed, and treated.

Stenosis of the true lumen of bifurcations during acute AD has no clinical symptoms. Therefore, there have been reports of spontaneous resolution of true lumen stenosis being detected during follow-up observation.

At the time of admission, the present case had no findings that were suggestive of intestinal ischemia, such as elevation of transaminase levels or abdominal pain. Therefore, considering the risk of preventive treatment and the fact that spontaneous reperfusion was possible, we decided to perform follow-up observation.

Treatment methods include open surgery; intravascular treatment, such as revascularization of the central aorta via a thoracotomy, renal artery fenestration, and SMA bypass surgery; or endovascular intervention using thoracic endovascular aortic repair (TEVAR) and stent placement in SMA. Endovascular intervention using TEVAR is extremely useful in patients with acute Stanford B AD who have these types of complications.

In the present case, we performed angiography and diagnosed intestinal ischemia. We believe that we could achieve reperfusion faster by emergent placement of the stent rather than waiting for the preparation of an operating theater. Using IVUS, the true lumen was confirmed when placing the stent. We also placed the stent in such a

was placed. Total length of the stent was 14 cm, and the diameter was 12 mm. Contrast passed from the descending aorta into SMA, and branches of the celiac artery were also contrasted through a collateral source (Fig. 2).

The abdominal pain disappeared postoperatively, and both the lactic acid and transaminase levels gradually decreased.

The patient could eat again on hospital day 5 and was discharged on hospital day 27.

Three months after stenting, CT showed good patency of the stent (Fig. 3).

**Discussion**

For acute Stanford B AD cases without complications, conservative treatment focusing on antihypertensive measures is generally selected. However, cases that are complicated by organ ischemia or rupture have an extremely poor prognosis and require surgical treatment.

Intestinal ischemia occurs as a complication in approximately 5% of acute AD cases and is reported to have an extremely poor prognosis, with a mortality rate of 36%–90%.

When associated with intestinal ischemia, the clinical signs include abdominal pain and ileus, and apparent anomaly can be observed in the blood biochemistry. Furthermore, if there is usually irreversible intestinal necrosis, it is difficult to make decisions regarding the diagnosis and indications for surgery during the early period of onset.

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way that it started at the mouth of the dissection so that the more central portion exited into the aorta and the more peripheral portion resulted in obliteration of the dissection. Furthermore, to avoid creating a new tear, we selected a self-expanding stent that would not require balloon dilation.

Conclusions

Here, we reported on a case in which lifesaving surgery was performed to treat an acute Stanford B AD that was complicated by lower limb and intestinal ischemia. Lifesaving treatment was achieved by performing bilateral interfemoral artery bypass surgery and placing a stent in SMA. Going forward, a long-term follow-up will be required.

Disclosure Statement

All authors have no conflict of interest.

Author Contributions

Critical review and revision: all authors
Final approval of the article: all authors
Accountability for all aspects of the work: all authors

References