Iatrogenic Type A Aortic Dissection after Catheter Intervention for the Left Subclavian Artery

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Cardiac surgical procedure and catheter intervention of the aorta or its major branches have a potential risk for iatrogenic aortic dissection. This case demonstrates an iatrogenic type A aortic dissection after the elective balloon angioplasty for severe stenosis of the left subclavian artery orifice. The dissection retrospectively extended to the ascending aorta, and intramural hematoma was observed in the false lumen of the aorta. The ascending aorta was successfully replaced 14 days after the occurrence of dissection, using hypothermic circulatory arrest and antegrade selective cerebral perfusion. There were no outstanding complications. (Ann Thorac Cardiovasc Surg 2010; 16: 451–453)

Key words: aortic dissection, catheter intervention, iatrogenic

Introduction

Although relatively rare, aortic dissection is a major complication and may be life threatening during cardiac surgery or catheter intervention. We report a case of iatrogenic type A aortic dissection caused by catheter intervention of the left subclavian artery.

Case Report

A 69-year-old man with a history of hypertension, who had no evidence of either Marfan syndrome or systemic vasculitis syndrome, was referred to our hospital for vertigo. Radiological examination demonstrated severe stenosis of the left subclavian artery orifice (Fig. 1), and the systolic arterial pressure of the left arm was 30 mmHg lower than that of the right arm. Balloon angioplasty of the left subclavian artery orifice was performed. During this procedure, the patient experienced back pain, and a CT scan taken 2 days after catheter intervention showed Stanford type A aortic dissection (AD). DeBakey type IIIb AD occurred and extended to the ascending aorta retrospectively. The intramural hematoma was observed in the ascending aorta, and no peripheral organ malperfusion was found (Fig. 2). Surgical treatment was planned on the 14th day after onset of the dissection. Through median sternotomy, cardiopulmonary bypass was established with femoral and right axillary arterial cannulation and atrial drainage. Lower body circulatory arrest was obtained when the patient was cooled down to 22°C, and antegrade selective cerebral perfusion was established by direct cannulation of the left common carotid artery combined with previous cannulation for the right axillary artery. Entry of the dissection was observed at the left subclavian artery orifice, which was quite small and already occluded. The ascending aorta was successfully replaced by an artificial graft with open distal and open proximal anastomosis. The false lumen of the residual aorta was thrombosed by the computed tomography, and the patient was discharged on the 20th day after the operation without major complications.
Comment

Although relatively rare, iatrogenic AD is a major complication of cardiac surgery or catheter intervention and may be life threatening.\(^1,2\) The complication rate is uncertain; fatal complications are more likely to occur in elderly patients and in patients with diabetes mellitus, hypertension, or severe atherosclerotic disease of the aorta.\(^1,2\) There was a severe atherosclerotic change in the orifice of the subclavian artery in the present case, and physiological stress of the balloon catheter caused the intimal tear.

According to a report by the International Registry of Acute Aortic Dissection, iatrogenic AD comprises 5% of
all cases of AD. Furthermore, type A dissection is more likely to be correlated with the cardiac surgical procedure (69%); type B is mainly associated with catheter interventional procedures (88%). The case presented here is a rare case of Stanford type A iatrogenic AD associated with catheter intervention in which DeBakey type IIIb dissection occurred in the descending aorta and extended to the ascending aorta retrogradely. The overall mortality rate among patients with iatrogenic AD was not significantly different from that observed for patients with spontaneous AD; however, type B iatrogenic AD had a significantly higher mortality rate than type B spontaneous AD.

Iatrogenic AD sometimes decreases or disappears completely because its site of entry is often quite small compared to that of spontaneous AD, and it does not have an obvious reentry site or a patent false lumen. However, in contrast to spontaneous AD, patients with iatrogenic AD are more likely to develop fatal cardiac complications, such as myocardial ischemia or infarction or hemodynamic instability. The dissection was diagnosed 2 days after its occurrence in the present case. At that time, the patient was fortunately in a stable hemodynamic condition. He had a thrombosed false lumen of the ascending aorta and no peripheral organ malperfusion.

We report an extremely rare case of type A iatrogenic AD associated with catheter intervention. Although iatrogenic AD often decreases or disappears with conservative treatment, we selected surgical treatment because of the potential risk of aortic rupture and in consideration of the fatal results from AD of the ascending aorta in the natural course of developments.

References