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Type A aortic dissection following heart transplantation: A case report

type A AD after heart transplantation

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Abstract

BACKGROUND

Cardiac transplantation is considered the standard treatment for refractory end-stage heart failure. Worldwide, 5074 heart transplantations were performed in 2015. About 100 heart transplants are performed at the authors' center each year. The usual complications of heart transplantation include graft rejection, infection, and graft dysfunction. Aortic dissection after heart transplantation is very rare and is a serious complication that requires a hybrid procedure.

CASE SUMMARY

A 58-year-old female patient was admitted to Union Hospital Affiliated with Tongji Medical College of Huazhong University of Science and Technology in July 2020 because of unprovoked low back pain without precipitating causes. Magnetic resonance imaging and computed tomography angiography showed type A aortic dissection with an aberrant right subclavian artery. After admission, urapidil was used to control blood pressure. Ten days later, the patient underwent ascending aortic and aortic arch replacement, subclavian artery reconstruction, and endovascular repair of abdominal and thoracic aortic aneurysms. A cardiopulmonary bypass was established through the right femoral artery and femoral vein. The aberrant right subclavian artery, innominate artery, left common carotid artery, and left subclavian artery were blocked, and the left and right common carotid arteries were cannulated for bilateral cerebral perfusion.

CONCLUSION

Right axillary artery could not be selected for cardiopulmonary bypass intubation because of aberrant right subclavian artery.

Key Words: Type A aortic dissection; Heart transplantation; Aberrant right subclavian artery; Cardiopulmonary bypass; Case report

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Core Tip: Type A aortic dissection after heart transplantation needs surgery. If the patient has an aberrant right subclavian artery, unilateral antegrade cerebral perfusion through the right axillary artery cannot be performed.

INTRODUCTION

Heart transplant recipients are at risk for post-transplantation complications such as rejection, infection, and graft dysfunction [1]. Still, post-transplantation aortic dissection is rare. The course of the disease and surgical management of this are reported here.

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CASE PRESENTATION

Chief complaints

A 58-year-old female patient was admitted to our center because of low back pain without precipitating causes.

History of present illness

Magnetic resonance imaging showed a type A aortic dissection involving the aortic arch and extending to the ascending aorta up to the end of the left common iliac artery with an anomalous right subclavian artery (ARSA) (**Figure 1**).

History of past illness

The patient underwent orthotopic heart transplantation (Bicaval technique) 28 mo ago for dilated cardiomyopathy with a left ventricular ejection fraction (LVEF) of 23%. Her immunosuppressive protocol including tacrolimus (0.5mg, qod), Mycophenolate Mofetil (0.5g, q12h) and prednisone (20mg, bid). The donor was a 24-year-old male with no reported medical history.

Personal and family history

The patient also had hypertension and diabetes mellitus.

Physical examination

Blood pressure on admission was 147/104 mmHg, and body mass index (BMI) was 30.1 kg/m².

Laboratory examinations

The value of D-dimer is 0.84 mg/L, G and GM tests are negative.

Imaging examinations

On September 3, 2020, magnetic resonance imaging (MRI) showed a type A aortic dissection involving the aortic arch and extending to the ascending aorta up to the end of the left common iliac artery with an anomalous right subclavian artery (ARSA) (**Figure 1**). The echocardiogram showed mild aortic valve insufficiency. The patient was diagnosed with type A aortic dissection.

FINAL DIAGNOSIS

The patient was diagnosed with type A aortic dissection after heart transplantation.

TREATMENT

The patient underwent a hybrid procedure which includes ascending aortic and aortic arch replacement, subclavian artery reconstruction, and endovascular repair of abdominal and thoracic aortic aneurysms. A cardiopulmonary bypass was established through the right femoral artery and femoral vein when the core body temperature was lowered to 30-32°C. The aberrant right subclavian artery, ³innominate artery, left common carotid artery, and left subclavian artery were blocked, and the left and right common carotid arteries were cannulated for bilateral cerebral perfusion. The distal port of the 24# four-branched artificial vessel was anastomosed with the proximal

covered stent of the descending aorta. Cardiopulmonary bypass was resumed, and the body temperature was gradually turned to normal. The proximal port of the four-branched artificial vessel was anastomosed with the proximal autogenous aortic vessels padded with bovine pericardium. The heart restarted spontaneously. The four branches of the aortic arch were reconstructed one by one. A 30×200 mm aortic-covered stent was implanted through a femoral artery incision. (Figure 2).

The procedure lasted 510 min, the cardiopulmonary bypass lasted 133 min, and the ascending aorta was blocked for 10 min. The duration of ventilator assistance was 64.5 h after surgery and the stay time in ICU was eight days for a lung infection and blood pressure control.

OUTCOME AND FOLLOW-UP

On the third day after surgery, the patient was diagnosed with pneumonia and was treated with sulbactam sodium/cefoperazone sodium. During the postoperative period, esmolol hydrochloride and urapidil hydrochloride were used to control blood pressure. Ulinastatin was used to reduce myocardial reperfusion injury. Sulbactam sodium/cefoperazone sodium was used to prevent and control infection. Omeprazole was used to inhibit gastric acid secretion. The patient was discharged home 25 days after surgery without low back pain. One month after discharge, the patient complained of cough and expectoration. Erythrocyte sedimentation rate was 34 mm/h, and C-reactive protein was 35.9 mg/L. The above laboratory tests were normal after anti-infection treatment for seven days. The patient had no symptoms, cough, and sputum.

DISCUSSION

Aortic dissection after heart transplantation is very rare and is a serious complication [2]. In this case, the hybrid procedure shortened the operation time and reduced complications. Because the patient had an ARSA, the right axillary artery could not be selected for cardiopulmonary bypass intubation.

Arterial ²hypertension is one of the most important risk factors for aortic dissection in general and occurs in about 71% of heart transplant patients in the first year after transplantation [3]. Tacrolimus, corticosteroids [4] and post-transplant weight gain are also related to arterial hypertension [5].

The patient had an ARSA, which is encountered in approximately 1% of the population. In this case, the dissection originated from an entry tear in the transverse arch. Of crucial importance, unilateral antegrade cerebral perfusion through the right axillary artery could not be performed.

CONCLUSION

Type A aortic dissection following heart transplantation is a rare complication that requires emergency surgery. The patient benefited from a hybrid procedure, which shortened the operation time and reduced complications.

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