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Single-stage repair for ascending aortic aneurysm, artery stenosis and occlusion of neck vessels caused by Takayasu arteritis

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Abstract

Takayasu arteritis results in a variety of vascular symptoms, and there are some cases in which progressive vascular lesions require surgical intervention. We present a case with ascending aortic aneurysm, right common carotid artery stenosis, left common carotid artery occlusion and left subclavian artery stenosis caused by Takayasu arteritis that was successfully treated with total arch replacement and ascending aorta to right internal carotid artery bypass.

Keywords: Takayasu arteritis • Thoracic aortic aneurysm • Total arch replacement

INTRODUCTION

Takayasu arteritis (TA) is a disease with inflammation of the aorta and its large vessel branches, leading to various degrees of stenosis, occlusion and dilatation, with a variety of clinical symptoms [1, 2]. Although steroids are the first choice for therapy, there are some cases in which the vascular lesions progress to a stage requiring surgical intervention [3]. We report a case of a 34-year-old woman with ascending aortic aneurysm, arterial stenosis and occlusion of neck vessels caused by TA. We successfully performed total arch replacement (TAR) and ascending aorta to right internal carotid artery (RICA) bypass.

CASE REPORT

A 34-year-old woman was diagnosed with TA 3 years earlier and was started on steroid therapy, which was maintained with oral prednisolone of 10 mg/day. Computed tomography angiography revealed an ascending aortic aneurysm that had gradually enlarged to 60 mm in diameter. It also showed stenosis of the right common carotid artery and the left subclavian artery distal to the orifice of the vertebral artery, and occlusion of the left common carotid artery (LCCA; Fig. 1). TAR with reconstructions of the brachiocephalic artery (BCA), RICA and left axillary artery were deemed necessary.

Prior to a median sternotomy, the right common carotid artery, RICA, right external carotid artery and left axillary artery were exposed. The RICA was anastomosed using an 8-mm Fusion graft (Getinge, Goteborg, Sweden) before the establishment of cardiopulmonary bypass (CPB). Under hypothermic circulatory arrest (target rectal temperature of 25°C), the ascending aorta was opened and antegrade selective cerebral perfusion (ASCP) cannulas were inserted into the BCA, the anastomosed graft of the RICA and the left subclavian artery. ASCP was initiated at a flow rate of 10 ml/kg min and adjusted to maintain the radial arterial pressure between 40 and 70 mmHg. TAR was performed using a 26-mm Triplex 4-branch graft (Terumo Inc., Tokyo, Japan). The distal anastomotic site was between the BCA and LCCA. Subsequently, RICA graft, proximal site and BCA anastomoses were performed. After the patient was weaned off CPB, the side branch of the graft was anastomosed to the left axillary artery (Video 1). The CPB, cardiac ischaemic time, circulatory arrest time and ASCP time were 137, 81, 35 and 79 min, respectively.

The patient had an uneventful recovery and postoperative computed tomography showed good graft patency (Fig. 2).

DISCUSSION

Our patient with an ascending aortic aneurysm, artery stenosis and occlusion of the neck vessels due to TA was successfully treated by performing TAR and ascending aorta to RICA bypass.

When performing TAR for patients with arterial stenosis of the neck vessels, intraoperative cerebral protection needs to be tailored to the individual case. Although multiple preoperative imaging modalities revealed adequate maintenance of cerebral circulation via the arterial circle of Willis, we were concerned that the right vertebral artery might be predominantly perfused by non-pulsatile flow from the BCA alone, because of stenosis of the

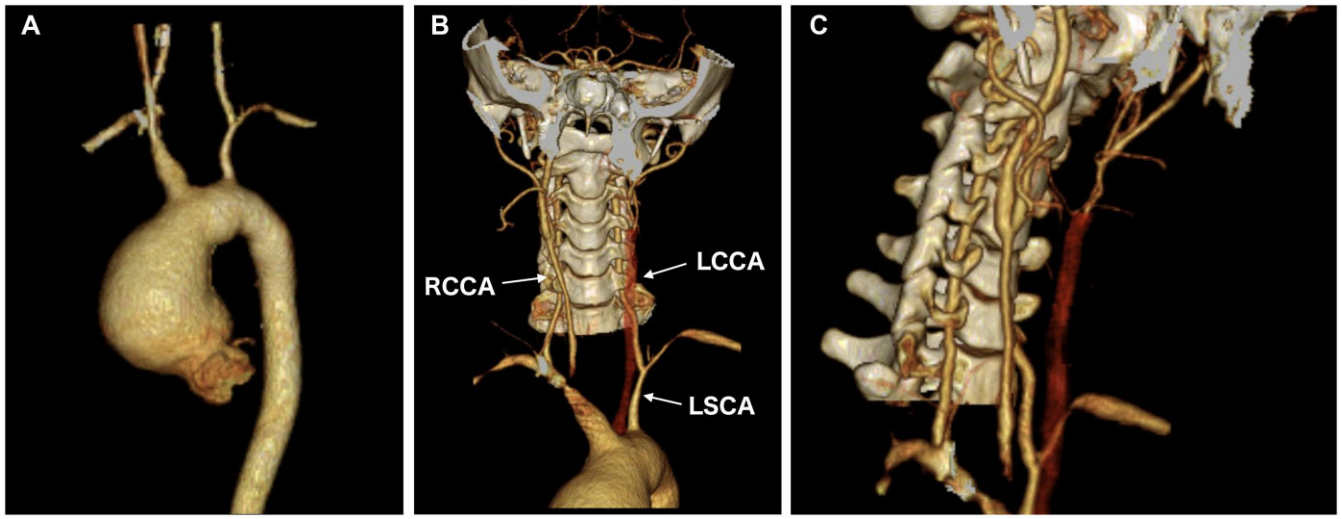


Figure 1: Preoperative computed tomography showing (**A**) ascending aortic aneurysm, (**B**) stenosis of the RCCA and the LSCA distal to the orifice of the vertebral artery, and occlusion of the LCCA and (**C**) severe stenosis of the RCCA. LCCA: left common carotid artery; LSCA: left subclavian artery; RCCA: right common carotid artery.

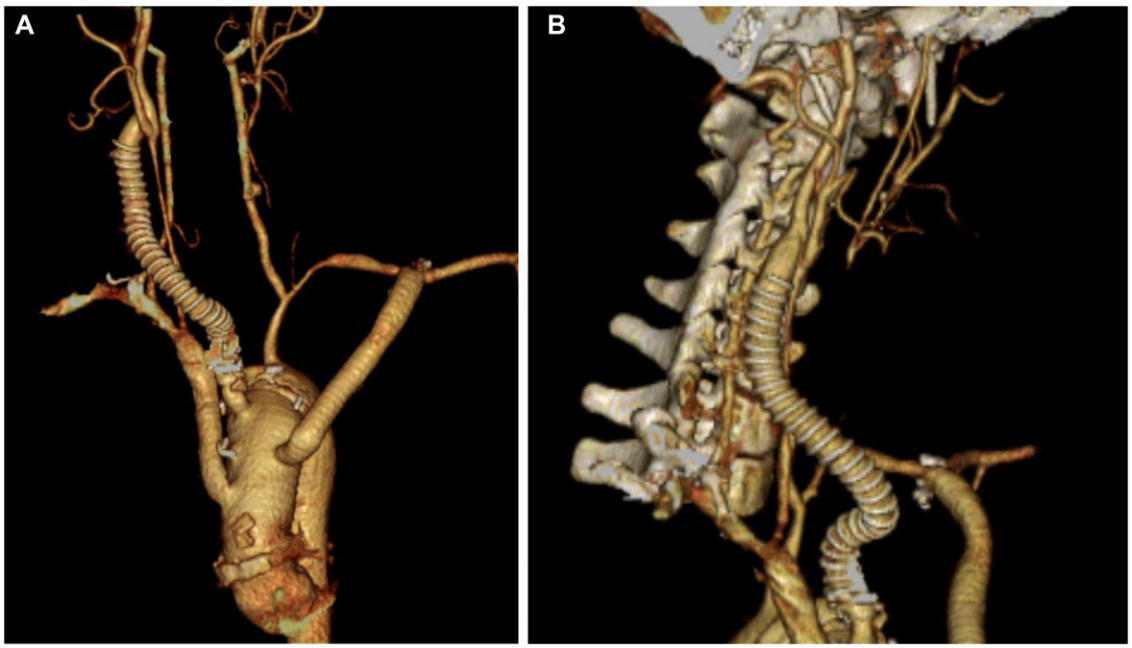
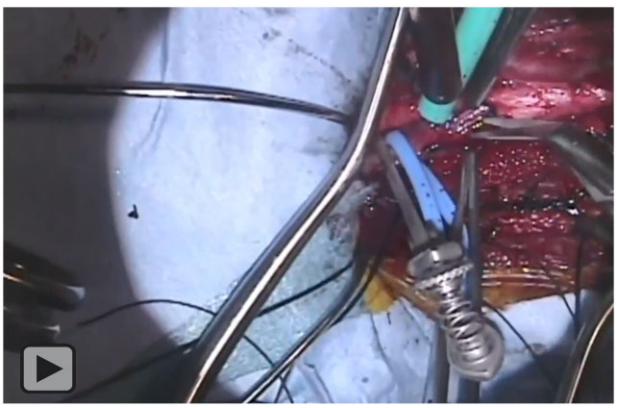


Figure 2: Postoperative computed tomography showing (**A**) no anastomotic aneurysm and (**B**) good patency of the graft to the right internal carotid artery.



Video 1: Operative details of total arch replacement and ascending aorta to right internal carotid artery bypass.

right common carotid artery [4]. Therefore, bypass to the RICA was performed prior to establishment of CPB, along with preparation for possible low perfusion from the ascending aorta or standard ASCP. Furthermore, although the LCCA was occluded, preoperative single-photon emission computed tomography revealed that cerebral vascular reserve was preserved in the left internal carotid artery territory, and it was determined that vascular reconstruction to the LCCA was unnecessary [5]. In fact, cerebral oxygen saturation remained stable during the surgery, and there was no postoperative neurological deficit.

In conclusion, we report a case of TA with artery stenosis and occlusion of the neck vessels that was treated by TAR and ascending aorta to RICA bypass with good results.

Conflict of interest: none declared.

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