SHORT REPORT

PTFE Patching to Prevent Anastomotic Aneurysm Formation in Takayasu’s Arteritis

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Introduction

Takayasu’s arteritis (TA) is a chronic inflammatory disorder of uncertain etiology primarily affecting the aorta and its main branches. It is usually seen in women under 40 years of age. The diagnosis of TA is generally based on signs and symptoms of vascular insufficiency such as intermittent claudication, decreased pulses and arterial bruits, and arteriographic findings.

Aortic aneurysms and clinical manifestations suggesting cerebral ischaemia require surgery.1,2 However, anastomotic aneurysms and graft occlusion of the graft are common complications. Control of inflammation should be achieved prior to surgery and corticosteroid therapy should be continued postoperatively as well.1,3

We performed a relatively new surgical technique to reduce the risk of anastomotic aneurysm formation in 2 patients with TA, both of whom had fulfilled the American College of Rheumatology criteria for classification of TA4 and had symptoms of cerebral ischaemia.

Case 1

A 28-year-old woman, diagnosed with TA at the age of 21, presented with a 4-month history of syncope, dizziness and headache. An arteriogram showed that left common carotid, left subclavian and right subclavian arteries were occluded (Fig. 1). She was treated with 20 mg/day prednisone for 6 weeks. Following this, an erythrocyte sedimentation rate (ESR) of 23 mm/h and C-reactive protein (CRP) of 0.9 mg/dl suggested that systemic inflammation was under control.

The patient underwent aorto-left carotid bypass grafting in November, 1996. The common carotid artery was fibrotic. The ascending aorta was side-clamped without obstructing blood flow and a bypass using 6 mm ringed polytetrafluoroethylene (PTFE), was performed between the aortic arch and internal carotid artery (Fig. 2A). After the release of the aortic clamp, the aortic anastomotic suture line was

Fig. 1. Preoperative arteriogram of Case 1. Left common carotid and both subclavian arteries are occluded.
reinforced with PTFE patch using 4/0 propylene sutures (Fig. 2B). Fibrin glue was used to fill the empty space between patch and PTFE graft suture line. The Systolic blood pressure was maintained at approximately 80–100 mmHg throughout the surgical intervention. There were no neurological complications and she was discharged on the 19th postoperative day. At 1-year follow-up, duplex ultrasonography revealed that PTFE graft was patent, she was still asymptomatic and weaned off prednisone. At 5-year follow-up, arteriography and duplex ultrasonography showed that the graft was patent and there were no complication such as aneurysmal formation.

Case 2

A 32-year-old woman with a 4-year history of TA, complained of dizziness and syncope for 6 months. Arteriography revealed that right carotid artery was occluded, the left carotid artery was hardly visualized and vertebral arteries were relatively expanded. She was treated with 20 mg/day prednisone and the inflammation was suppressed (ESR: 18 mm/h and CRP: 0.6 mg/dl).

The patient underwent a right subclavian-right carotid bypass grafting in March, 1999. The common carotid artery was fibrotic. A bypass was performed by using a 6 mm ringed PTFE graft between the right subclavian and internal carotid arteries. The subclavian anastomosis was reinforced with PTFE patching as before. The systolic blood pressure was maintained at approximately 80–100 mmHg during the procedure. Postoperatively, the patient’s symptoms disappeared and she was discharged on the 9th day. After 6-month follow-up, the corticosteroid regimen was stopped. She has been asymptomatic for more than 2 years, the graft has remained patent and no complications have occurred.
Discussion

It is generally agreed that surgical management should be utilized in patients with TA who develop uncontrolled renovascular hypertension, coronary or cerebral ischemia or severe claudication. However, the surgical approach to patients with TA has not been standardized, and many questions remain as to the optimal approach. Postoperative aneurysm formation, especially at the aortic anastomotic site, is a common complication. Miyata et al. observed a 12% cumulative incidence of anastomotic aneurysm at 20 years in 91 TA patients who had 259 anastomoses.

The goal of our reconstructive technique by using PTFE patching is to avoid the expansion and stretching of the anastomotic site in order to prevent aneurysm formation. Both patients who underwent that procedure did not show an anastomotic aneurysm or any other complication during follow-up period. No similar operations have been described previously, but these did not include covering of the anastomotic site with a patch. Iwai et al. described a similar technique in two patients with TA. This technique included strip tying of PTFE graft and mesh wrapping of anastomotic site.

In reconstructive operations for most atherosclerotic aortic diseases, covering of the anastomosis with mesh is not usually necessary. However, in patients with an inflammatory arterial disease, such as TA or Behçet’s disease, the standard technique may not be adequate because of the destruction of the medial lamina and elastin fibers during the early, active phase of the disorder. The distal carotid anastomosis can be performed as usual without any extra intervention, since this site is less involved in TA and the blood pressure is relatively lower here.

In conclusion, we suggest that surgical intervention should not be performed during active phase of TA in order to avoid possible complications. The proximal anastomotic site should be covered with PTFE patching. We think that this relatively new and easy technique could prevent further complications.

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References


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