Revascularization for left main ostial stenosis with right internal thoracic artery in Takayasu's disease

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Introduction

Takayasu's arteritis was first described in 1908. This is a non-specific granulomatous panarteritis affecting the large and medium sized arteries[1]. This disease has a prediliction for young Asian women; the etiology is unknown. The incidence of coronary artery involvement in Takayasu's arteritis is about 10%[1,2]; coronary ostia are most frequently involved (73%) and less frequently the proximal vessels[3]. The ischemia caused by coronary lesions in Takayasu's arteritis is one of the major cause of death. Patients with left main ostial stenosis complicating Takayasu's arteritis require myocardial revascularization, however the selection of graft material is controversial. As the branch vessels of the aorta are often affected by Takayasu's disease, vein grafts are preferable[4]. We report a case of Takayasu's arteritis with ostial stenosis of the left main coronary artery (LMCA) and also involving the proximal segment of the left subclavian artery (LSA) where coronary artery bypass grafting (CABG) was done using the right internal thoracic artery (RITA).

Case Report

35-year-old lady presented with a history of angina of 6 months duration, she was in New York Heart Association (NYHA) functional class III. She fulfilled the clinical diagnostic criteria for Takayasu's arteritis. There was no history of diabetes, hypertension and hypercholesterolemia or family history of coronary artery disease (CAD). On examination her heart rate was 80 beats per minute and regular. Blood pressure in the left upper limb was 100/80 mm Hg and 130/90 mm Hg in all the other three limbs. The left brachial and radial artery pulsations were found to be feeble, and other peripheral pulses were normal. Erythrocyte sedimentation rate (ESR) was 20mm at the end of first hour. Bruit over the LSA was present. Her chest X ray and the electrocardiogram were normal. Trans- thoracic echocardiogram (TTE) did not show any wall motion abnormalities and left ventricular ejection fraction was 68 percent. A neck vessel Doppler was normal except 60% stenosis of the proximal segment of LSA. Treadmill test was strongly positive for inducible ischaemia. Four-vessel angiogram revealed 70 percent stenosis of the proximal segment of the LSA (Fig. 1a), normal innominate artery and its branches (Fig. 1b), and the cerebral vessels were normal. She also had an 80 percent ostial stenosis of the right renal artery. Coronary angiogram revealed a near total occlusion of the LMCA origin (Fig. 1c), rest of the coronary vessels were normal. She was scheduled for CABG and the procedure was performed through a median sternotomy. RITA was harvested as a pedicled graft. RITA pedicle was taken anterior to the right ventricular outflow tract and grafted to the left anterior descending artery (LAD) using standard cardiopulmonary bypass. The patient was

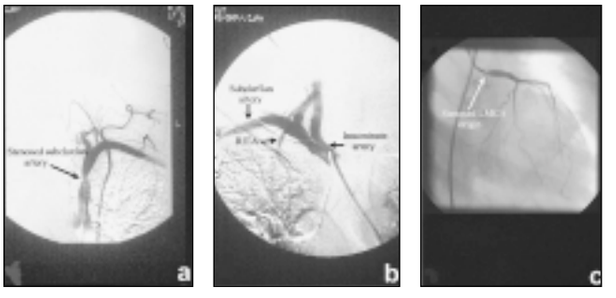

Fig. 1a. Pre-operative angiogram showing stenosed left subclavian artery.
b. Pre-operative angiogram showing innominate artery and its branches.
c. Pre-operative coronary angiogram showing a near total occlusion of the left main coronary artery ostium

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successfully weaned off bypass in the first attempt, without any inotropic support and had an uneventful postoperative course. She was discharged on the seventh postoperative day.

At six months follow up, she was in NYHA class I, ESR was 13 mm at one hour, her blood pressure remained unchanged. TTE did not show any wall motion abnormality and ejection fraction was 80%. Repeat angiogram did not reveal any progression of the lesions in the vascular tree (Fig. 2a), and patent RITA-LAD anastomosis (Fig. 2b). Intervention was not considered for the renal artery lesion, in view of the normal blood pressure, normal renal function tests and non- progression of the lesion.

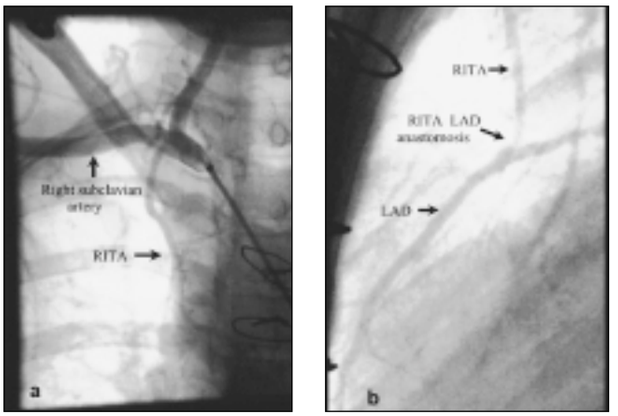

Fig. 2a. Postoperative angiogram showing normal right subclavian artery and its branches
b. Postoperative angiogram showing a patent RITA – LAD graft.

Discussion

A patient with LMCA stenosis in Takayasu's disease requires myocardial revascularization. Operative procedures for ostial stenosis are controversial. The various techniques that have been used with success are coronary artery bypass grafting, surgical angioplasty of the LMCA, and trans-aortic coronary ostial endarterectomy[5]. Percutaneous coronary angioplasty with stenting has also been reported[6]. Because of frequent involvement of the branch vessels of the aorta, especially proximal portion of the subclavian arteries in Takayasu's disease, saphenous vein grafts are preferred[3,4,7]. However in patients whose occlusive lesion of the subclavian artery is located more distal than the derivation of the internal thoracic artery (ITA) the use of ITA grafts for coronary revascularisation might be possible[5]. As RITA, innominate artery and its branches were normal in our patient and considering long-term results of the internal thoracic artery graft, we chose the RITA as the conduit and grafted to LAD. But one must keep in mind the possibility of later involvement of subclavian artery when choosing ITA as a bypass graft. However significant subclavian artery stenosis can be safely treated by percutaneous angioplasty with a high success rate and good long-term result[8].

Distal lesions in the coronary arteries are not as common as atherosclerosis in Takayasu's arteritis; in fact Endo et al.[5] reported that 19 of 20 patients had left main ostial stenosis. Coronary ostial stenosis occurs as a result of extension of the inflammation induced intimal proliferation and fibrous contraction from the ascending aorta and the coronary ostia[9]. In case of LMCA stenosis, it has been angiographically demonstrated that grafting of the LAD alone provides adequate perfusion of the circumflex territory[3]. While using saphenous vein the proximal anastomosis to an unhealthy and diseased aorta may be a technical challenge, and disease process at the site of anastomosis may cause early graft failure. Even the patency rate of the saphenous vein at four years has been reported to be low (60%)[10].

Angiographic evaluation at six months follow-up showed a patent graft and there has been no progression of her vascular lesions. Long term follow up and larger series may define the place of internal thoracic artery graft in selected cases of Takayasu's arteritis with coronary arterial involvement, when the subclavian and / or innominate arteries are disease free or occlusive lesion is located more distally.

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