Case Report

A Successful Management of Concomitant Renovascular Hypertension and Symptomatic Subclavian Steal Syndrome due to Takayasu's Arteritis Using Balloon Angioplasty and Axillo-axillary Bypass Grafting

Seijiro Yoshida, MD,[1] Kei Sakuma, MD,[1] Osamu Ueda, MD,[2] and Masahiro Sakurai, MD[3]

We present a case of Takayasu's arteritis with severe renovascular hypertension and symptomatic subclavian steal syndrome. A 60-year-old woman underwent successful percutaneous balloon renal angioplasty and axillo-axillary bypass grafting. The role of hybrid therapy, angioplasty and extra-anatomical bypass grafting for revascularization of symptomatic ischemia in this disease is reviewed. (Ann Thorac Cardiovasc Surg 2003: 9; 334–6)

Key words: Takayasu's arteritis, subclavian steal syndrome, renovascular hypertension, balloon angioplasty, axillo-axillary bypass grafting

Introduction

Takayasu's arteritis is an inflammatory disease affecting the aorta and its main branches. The clinical picture depends on the effects of regional organ ischemia. Because of the extensive arterial lesion and the intense inflammatory change, the procedure of revascularization, either by surgical or angioplasty technique, is controversial.

Here, we experienced the successful management of concomitant renovascular hypertension and symptomatic subclavian steal syndrome due to Takayasu's arteritis. The role of hybrid therapy, angioplasty and extra-anatomical bypass grafting for revascularization of ischemia in this disease is reviewed.

Case Report

A 60-year-old female was admitted to a nearby hospital for evaluation of hypertension. Her right radial pulse was absent and a gap between blood pressure values in the extremities was pointed out. She was referred to our hospital for more investigation. On admission, she was 155 cm in height and weighed 54.5 kg. She presented with severe hypertension despite combination therapy with 5 mg amlodipine and 25 mg atenolol daily. She had also experienced dizziness with movement of the right upper extremity. Her arterial blood pressure in the right upper extremity was much lower than that in the left upper extremity, 130/60 in the right and 200/110 in the left. Erythrocyte sedimentation rate was 32 mm/h and renal function was normal.

Angiographies revealed complete obstruction of the right subclavian artery and the right axillary artery was supplied by collateral circulation from the right vertebral artery, which was diagnosed as subclavian steal syndrome (Fig. 1a). On the same angiographical examination, 90% stenosis of the left renal artery and 90% stenosis at the origin of the superior mesenteric artery were noted (Fig. 1b, c). Despite signs of systemic inflammation being unclear, angiographical examination allowed a diagnosis of type III Takayasu's arteritis. Based on these findings and clinical symptoms, we performed percutaneous transluminal angioplasty (PTA) with a stent for the left renal artery stenosis using a 6 mm balloon catheter via the right femoral artery (Fig. 2). Secondly, we performed revascularization of the right upper limb with bypass grafting from the left axillary artery to the right axillary artery using a 6-mm-diameter ringed graft through the subcutaneous tunnel.

Postoperative bypass graft patency was easily determined by Doppler ultrasonography and even by

From Departments of [1]Cardiovascular Surgery and [2]Cardiology, Chiba Tokushuukai Hospital, Funabashi, and [3]Department of Cardiovascular Surgery, Tohoku University School of Medicine, Sendai, Japan

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Address reprint requests to Seijiro Yoshida, MD: Department of Cardiovascular Surgery, Chiba Tokushuukai Hospital, 1-27-1 Narashinodai, Funabashi, Chiba 274-8503, Japan.

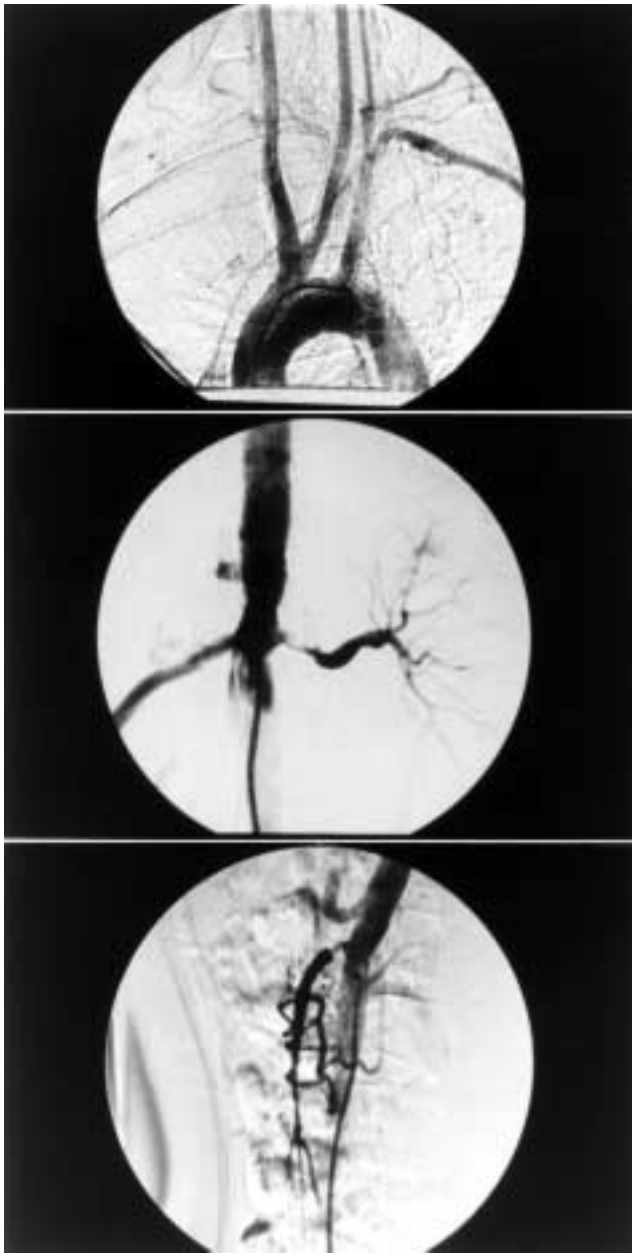

Fig. 1. Preoperative angiographies showing (a) complete obstruction of the right subclavian artery, (b) 90% stenosis of the left renal artery and (c) 90% stenosis at the origin of the superior mesenteric artery.

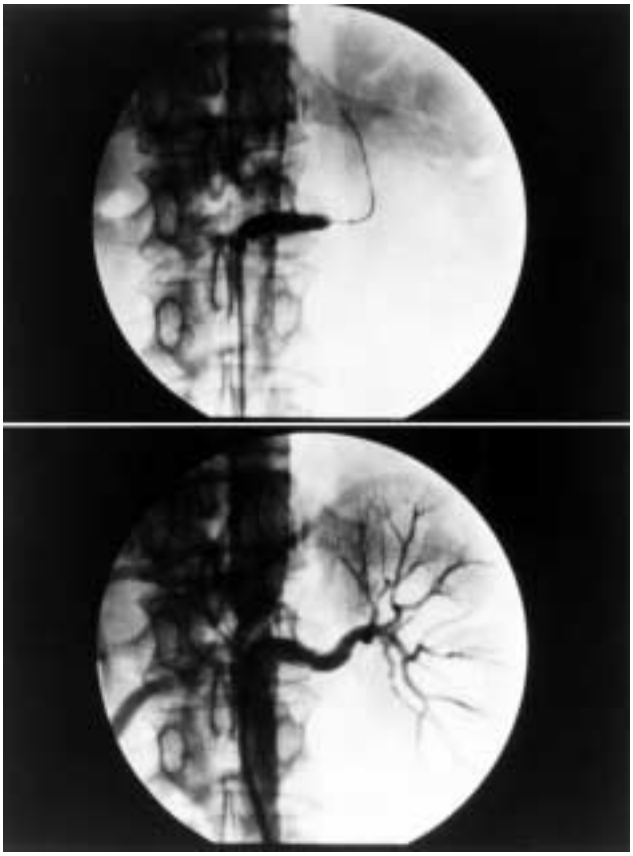

Fig. 2. a: PTA with a stent was performed for the left artery stenosis using a 6 mm balloon catheter. b: The left renal artery is fully dilated.

palpation. After these treatments, the patient's symptoms due to subclavian steal syndrome disappeared and her general condition improved remarkably. At discharge, her blood pressure in the upper extremities was 136/64 in the left and 118/60 in the right with no therapy.

Discussion

Takayasu's arteritis is a chronic inflammatory disease of unknown origin involving predominantly the aorta or its main branches. The etiology still remains unclear, but clinical and experimental data suggest the possible existence of an autoimmune disorder and genetic factors playing a role in the genesis.[1,2] Clinical manifestations of the disease are quite varied, depending on the location and the extent of the occlusive or dilative process. As a consequence of the stenotic process, arterial insufficiency leads to ischemic injury of extremities and/or end organs, which can result in a limb or life threatening state. Lupi-Herrea et al. reported that the incidence of inflammation was higher for the subclavian artery (85%), descending aorta (67%), common carotid artery (44%) and ascending aortic arch (27%) than for the iliac artery (16%) and femoral artery (3%).[3] Surgical revascularization has been attempted in order to relieve symptoms and to limit irre-

versible end-organ ischemic injury and death. Difficulties of operative management should be anticipated because of the complexity of the pathological changes produced by inflammation as compared to arteriosclerotic lesions. The aortic wall is extremely fragile and is destroyed by acute granuloma-formation or proliferative inflammation.[4)]

Renovascular hypertension is very common in Takayasu's arteritis and is practically resistant to drug therapy. The frequency of obstructive renal artery lesions ranges from 34% to 85%.[3,5)] Surgical revascularization of the renal artery is complex and has a higher morbidity and mortality in Takayasu's arteritis than in equivalent obstructive arteriopathy due to atherosclerosis. Development of anastmotic false aneurysms, and early postoperative thrombosis in the reconstructed renal arteries are observed in 10% to 50% of patients.[6,7)] In recent years, percutaneous transluminal renal angioplasty in Takayasu's arteritis has been performed in many cases. In contrast to the high operative mortality during surgical revascularization, the results are not very different from those obtained following angioplasty for the atherosclerotic lesions of renovascular hypertension.[8)] On the other hand, controversy exists concerning which procedure is best for correcting the subclavian steal syndrome. PTA for this lesion has been performed in some cases, but this syndrome still often requires surgical procedures. PTA is useful for subclavian steal syndrome caused by atherosclerosis but careful technique is necessary to avoid embolism for patients who have other coexisting severe diseases such as severe carotid artery stenosis. In one study, 32% of the patients with subclavian or innominate arterial occlusions had carotid artery disease.[9)] Axillo-axillary bypass grafting has been introduced as an effective and easy approach.[10,11)] This procedure does not require opening the thoracic cavity, which is associated with higher mortality and morbidity rates, and is widely used without any detailed information of regional cerebral circulation.[12,13)] The long-term patency of the graft has been also demonstrated.[14,15)]

In the present case, we performed staged treatment, PTA for the left renal artery stenosis and axillo-axillary bypass for the right subclavian artery occlusion. The result was excellent and the patient was discharged with no complication. We concluded combining balloon angioplasty with bypass grafting should be considered for the patients with Takayasu's arteritis who have several coexisting severe lesions and could be a higher risk for increased mortality and morbidity.

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