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Takayasu's arteriopathy with associated occlusion of right coronary artery, brachiocephalic trunk and left subclavian artery and aortic regurgitation. Cardiovascular approach leading to a successful outcome — a case presentation

Skuteczne leczenie chirurgiczne pacjentki z chorobą Takayasu, ze zwężeniem prawej tętnicy wieńcowej, pnia ramienno-głowowego i lewej tętnicy podobojczykowej oraz z ciężką niedomykalnością zastawki aortalnej — opis przypadku

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Abstract

In a 37 year-old woman with Takayasu's arteriopathy angiography revealed occlusion of right coronary artery (RCA), brachiocephalic trunk and left carotid artery (LCA), as well as aortic regurgitation. She underwent a complex cardiovascular surgery consisting of aortic valve implantation, RCA grafting and implantation of vascular bifurcated graft anastomosed between ascending aorta and brachiocephalic trunk and LCA. The multi-slice computed tomography performed two weeks after the operation revealed preserved grafts patency.

Key words: Takayasu's arteriopathy, arteries occlusion, bifurcated graft, vasculitis, pulseless disease

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INTRODUCTION

Takayasu syndrome, also known as pulseless disease and Takayasu's arteritis (TA), is a rare form of vasculitis of unknown origin. It causes chronic inflammatory disease of the aorta and its major branches [1]. It can also affect pulmonary and coronary arteries. The inflammation narrows the lumen of the arteries and can eventually cause thrombosis. In some cases, the weakness of the walls results in an aneurysm that causes death [2]. The disease was discovered by Dr. Mikito Takayasu, an ophthalmologist, in 1908 in Japan. He noticed a 'wreathlike' formation of blood vessels behind the retina. This new blood vessel growth is a response to the narrowing of the arteries in the neck. Some of Takayasu's colleagues found that pulse in the wrist was absent due to the narrowing of the arteries in the arm [3]. The TA most commonly affects young women aged 20–40.

CASE PRESENTATION

A 37 year-old woman admitted to hospital with a history of persistent fatigue, nocturnal perspiration and an increased blood sedimentation rate. Because of her symptoms, she was admitted to hospital. Hospital examinations at that time re-

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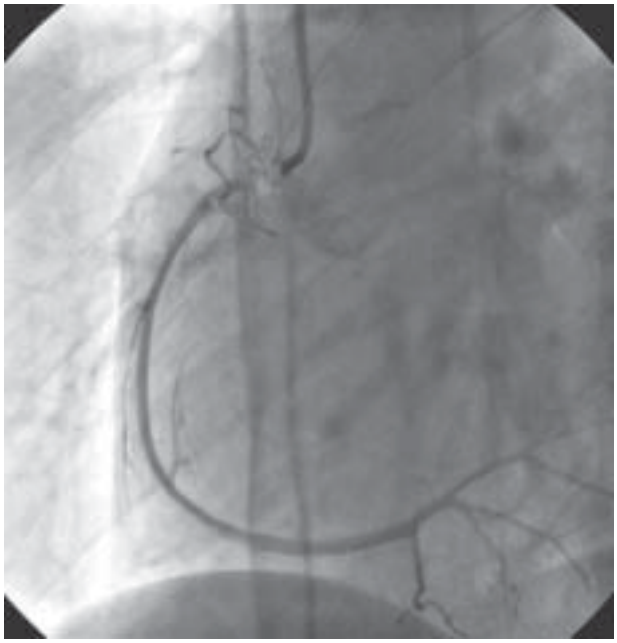

Figure 1. Coronarography revealing right coronary artery occlusion

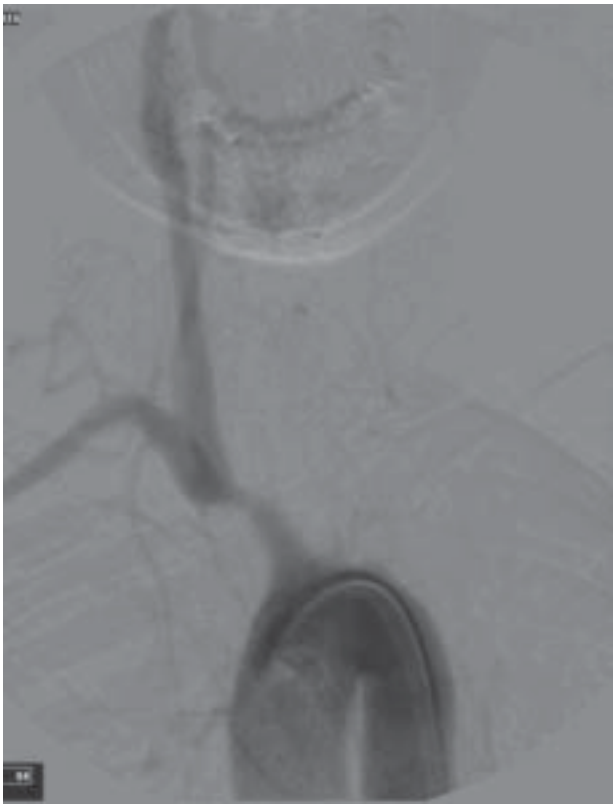

Figure 2. Digital subtraction angiography: occlusion of brachiocephalic trunk

vealed no abnormalities apart from increased C-reactive protein (CRP) level. During next seven years she remained asymptomatic. Three months before the current presentation she was admitted to hospital due to a transient ischaemic attack. On admission, her white blood cell count was 11,000/mm^3, lymphocytes 27.4%, monocytes 5.5%, granulocytes 67.1%, platelets 445 × 10^9/L, haemoglobin 11.7 gm/dL, haematocrit 36%, her erythrocyte sedimentation rate was 60 mm/h, and CRP 31.9 mg/L. The ECG demonstrated regular sinus rhythm, while echocardiography revealed severe aortic regurgitation, and computed tomography of her head did not demonstrate any abnormalities. Due to the unclear course of the disease and to the echocardiographical findings, the patient was transferred to the cardiological unit. Coronarography demonstrated right coronary artery occlusion (Fig. 1). Doppler carotid ultrasound imaging revealed vestigial flow at the left vertebral artery and latent flow at the left subclavian artery. Angiography (DSA) demonstrated occlusion of the proximal segment of the left subclavian artery and brachiocephalic trunk (Fig. 2) as well left vertebral artery stenosis. Brain blood flow was maintained predominantly by the right vertebral artery, and by the collateral circulation. The patient was qualified to receive a complex cardiovascular operation.

SURGERY

The operation was performed on 15 April 2009. Thoracotomy was performed and ascending aorta, aortic arch with branching-off of a brachiocephalic trunk were exposed. A separate neck incision was then made to expose the carotid bifurcation. A subfascial tunnel was developed between the two areas. After systemic heparin (0.7 mg/kg) had been administered, a side-biting clamp was placed on the ascending aorta, which was soft and not adhesive. The proximal end of a bifurcated 14 × 7 mm silver polyester vascular prosthesis (B. Braun, Germany) was anastomosed to it. The distal ends of the graft were closed and one of them was introduced into the tunnel and anastomosed to the left carotid artery. Another end of the graft was anastomosed to the brachiocephalic trunk. When the aorta and left atrium were cannulated, a cross clamp was placed at the ascending aorta. After right coronary artery revascularisation using a saphenous vein graft, an aortic bioprosthesis was implanted (21 mm SAV, Edwards Lifesciences, Irvine, CA, USA). Following this, an aortic cross-clump proximal anastomosis was performed. The cross clump time was 36 minutes and the ECC time was 119 minutes.

The post-operative course was uneventful. Post-operative angiography (multi-slice computed tomography) two weeks after the procedure revealed good patency of the bypass grafts (Fig. 3).

DISCUSSION

For arterial reconstruction of the supraaortic trunk when an extrathoracic bypass is not indicated, bypass grafting from the ascending aorta is the preferred method; the descending thoracic aorta has only rarely been used as an inflow site. In

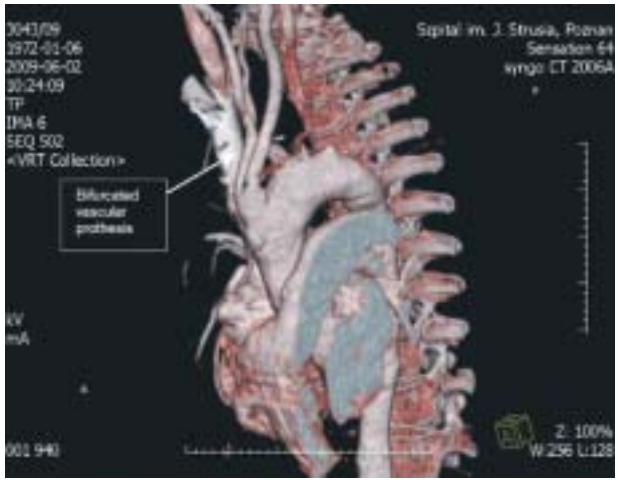

Figure 3. Multi-slice computed tomography revealing good patency of the bypass grafts

addition, aortic involvement in TA has been classified into five patterns: type I, branches from the aortic arch; type IIa, ascending aorta, aortic arch and its branches; type IIb, type IIa + thoracic descending aorta; type III, thoracic descending aorta, abdominal aorta, and/or renal arteries; type IV, abdominal aorta and/or renal arteries; and type V, combined features of types IIb and IV [4].

In type I disease, the inflammatory process does not involve the descending aorta. Our patient had type I disease. Our patient underwent a coronary artery bypass grafting (CABG) procedure using a vein graft. Takayasu's disease affects the aorta and its major branches including the coronary arteries, some of which may require CABG. Since the major branches of the aortic arch are also frequently affected by it, the internal mammary arteries are unsuitable for use in CABG. Which conduit to choose — either a saphenous vein graft or an internal mammary artery (IMA) — is controversial. The long-term graft patency of the IMA as opposed to that of the saphenous vein in atherosclerotic patients favours the use of the IMA, provided that its origin, and that of the proximal subclavian artery, are normal [5]. In our patient, conventional CABG with a saphenous vein graft was used because the left subclavian artery was involved in the inflammatory process. In cases of concomitant coronary and arch-vessel involvement, saphenous vein grafting is the better choice [6, 7].

In this case, aortic bioprosthesis was used because it was likely that the procedure would need to be repeated in the next few years. It is likely that the patient will suffer from other major arteries becoming involved in the inflammatory process, something that will require surgical intervention. Although the durability of the tissue valve is poorer and has a limited lifespan (thought to be approximately ten years), the patient will benefit through avoiding the chronic use of blood thinners.

CONCLUSIONS

Although our patient did not suffer from any complications, and the whole perioperative period was uneventful, in Takayasu's syndrome the prognosis is not good.

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