



Aortic Bypass Surgery Simultaneously Performed with Coronary Artery Bypass Grafting and Mitral Valve Replacement in a Patient with Takayasu Arteritis: A Case Report

Takayasu Arteritli Bir Hastada Koroner Bypass ve Mitral Kapak Replasmanı ile Eş Zamanlı Uygulanan Aorta-Bisubklavian Bypass Operasyonu: Olgu Sunumu

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Abstract

Initially characterised by involvement of the aorta and its main branches, eye disorders, and weakening of the upper extremity pulses, Takayasu's arteritis is a vascular disease with unknown etiology. There are several surgical options for its treatment. A 54-year-old male with Takayasu's arteritis was presented in our clinic with unstable coronary artery disease. The patient underwent operation with a diagnosis of ischemic mitral regurgitation. Turuncus brakiosefalikus and left subclavian artery osteal were occluded and we also observed signs of subclavian steal syndrome. For a safe surgery and to maintain cerebral perfusion we first performed ascending aorta bypass with a dacron graft. Then we simultaneously performed aortic-coronary bypass and mitral valve surgery. Prior to the operation, we initiated a steroid therapy, which continued post-operatively. We did not observe any complications. In order to maintain cerebral perfusion, we believe that open heart surgery and vascular procedures can be simultaneously and safely applied in patients with Takayasu arteritis who are in their remission period.

Key Words: Takayasu's Arteritis; Aortabisubklavian Bypass; Coronary Artery Disease.

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Özet

Takayasu arteriti, temelde aorta ve büyük dallarını tutan göz bozuklukları ve üst ekstremitelerde nabızında belirgin zayıflamayla karakterize etiyolojisi bilinmeyen bir damar hastalığıdır. Bu hastalıkta cerrahi tedavi seçenekleri farklı özelliklere göre şekillenebilmektedir. 54 yaşında Takayasu arteriti olan erkek hasta kliniğimizde unstable koroner arter hastalığı ve iskemik mitral yetmezliği tanılarıyla opere edilmiştir. Hastada turuncus brakiosefalikus ve sol sub-klavian arterin osteal tıkalı olduğu ve subklavian steal sendromu olduğu izlenmiştir. Operasyonda güvenli bir cerrahi için serebral perfüzyonun devamı açısından öncelikle dacron greftle asendan aorta bisubklavian bypass yapılmıştır. Sonrasında eş zamanlı olarak aortakoroner bypass ve mitral valve operasyonu gerçekleştirilmiştir. Operasyon öncesi remisyonda olan hastaya steroid tedavisi başlanmış ve operasyon sonrası da devam edilmiştir. Hastada herhangi bir komplikasyon izlenmemiştir. Remisyon dönemindeki Takayasu arteritli olgularda serebral perfüzyonun devamı açısından açık kalp cerrahisiyle eş zamanlı vasküler

prosedürlerin güvenle uygulanabileceğini düşünüyoruz.

Anahtar Kelimeler: Takayasu Arteriti; Aortabisubklavian Bypass; Koroner Arter Hastalığı

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INTRODUCTION

Takayasu arteritis (TA) is a rare large vessel vasculitis affecting the aorta, main branches of aorta and pulmonary artery. Involvement of thoracic aorta and branches is more frequent than that of abdominal aorta and its branches. Ischemic manifestations of the organ supplied by retained artery are observed. Neurological symptoms and visual disturbances such as transient ischemic attack, stroke etc. may be seen if the arteries supplying the brain are affected, claudication may occur due to involvement of vessels supplying the extremities (1). At the beginning of the disease diagnosis may be difficult and delayed due to nonspecific symptoms such as fatigue, fever, weight loss. Although treatment response to corticosteroids is good, immunosuppressive therapy can also be added. Surgical treatment options in this disease can be shaped according to different characteristics. Methods such as by pass, endovascular stent or angioplasty can be applied in case of excessive stenosis or complete obstruction (2).

The annual incidence is 2.6 per million new cases and its prevalence is 2.6-6.4 per million. It is much more common in young women and its etiology is currently not fully understood. It is more common in Asian countries than the rest of the world. TA was first described by Shimizu and Sano (4) following the case report of Takayasu's (3) in 1908. Coronary artery involvement of granulomatous inflammation originating from aortic vasa vasorum and spreading to adventitia and media in the form of panarteritis was first detected by Frövig and Löken (5). The incidence of clinically diagnosed or autopsied coronary artery lesions in TA (6,7) not exceeding 10%, led us to present our case diagnosed as symptomatic coronary artery involvement and surgically treated. However, we believe that the coronary artery involvement in this case is largely due to atherosclerosis rather than arteritis. Biopsy is missing but this was not required as the patient was previously diagnosed with TA.

CASE REPORT

On July 2014, a 54-year-old male patient with previously known TA diagnosed as unstable coronary artery disease and ischemic mitral insufficiency was admitted to our clinic for surgery. The patient had complaints of chest pain (USAP), shortness of breath (New York Heart association [NYHA] Class-3), and rapid fatigue in the arms on exertion (claudication). The patient was a chronic smoker. On physical examination, blood pressure and pulse could not be obtained from all extremities of the patient. First routine tests, electrocardiography (ECG) and Telegraphy were requested. Routine workup did not show any significant pathologic findings except for slight elevation of acute phase reactants. On ECG; normal sinus rhythm together with rate: 76 per minute and in telegraphy; slight mediastinal expansion were detected. Carotid doppler ultrasonography (USG) showed decrease in right common carotid artery (CCA) and internal carotid artery (ICA) calibration, suspicion of distal occlusion in ICA and

reverse flow in left vertebral artery (subclavian steal syndrome) and decrease in diameter of right vertebral artery. Patient was then scheduled for multi-section carotid computed tomography (CT) angiography. CT angiography performed in the radiology clinic of our hospital showed ostial occlusion of truncus brachiocephalicus and left subclavian artery from the division of the arcus aorta. Transthoracic echocardiography revealed EF: 30%, dilatation of left heart chambers, left ventricular systolic and diastolic dysfunction, moderate-to-severe ischemic mitral insufficiency. Coronary angiography showed left main coronary artery (LMCA); normal, left anterior descending artery (LAD); total occlusion from proximal, retrograde filling of LAD distal through collaterals from circumflex artery (CX), CX; is dominant and in normal structure, right coronary artery (RCA); total obstruction in the middle portion and retrograde filling through collaterals from CX. Left subclavian artery was totally obstructed from the segment close to ostium. Then, coronary artery bypass grafting (CABG) + mitral valve surgery (MVR) was decided for the patient with TA on remission. However, for safe surgical operation, ascendant Aorta-Bisubclavian bypass was planned with a dacron Y graft primarily to ensure cerebral perfusion. Steroid therapy was started to the patient pre-operatively and continued post-operatively. During surgery, arterial monitoring was done from the femoral artery, and then the chest cavity was opened with a midsternal incision under general anesthesia. Concomitantly, great saphenous vein was prepared as a graft from the leg using subcutaneous dissection technique. Due to total ostial obstruction of left subclavian artery, no left internal mammarian artery (IMA) graft was prepared. The ascending aorta and bilateral subclavian arteries were prepared for anastomosis. The proximal anastomosis of the 14/7 Dacron Y graft under the side clamp was performed on the ascending aorta close to the brachiocephalic arterial division. Subsequently, distal anastomoses were performed in the subclavian arteries (Figure 1).



Resim 1. Takayasu arteritli olgunun CABGx2 ve MVR'a eş zamanlı uyguladığımız Asendan Aorta-Bisubklavian by pass Y greftin BT Angiorafideki görüntüsü.

Following systemic heparinization, aortic and bicaval cannulation and cardiopulmonary by-pass (CPB) was

performed. The aortic cannula was placed immediately to the lateral proximal part of the Y-graft. The body was cooled to 32°C during CPB. Following cross clamping of the aorta, antegrade and retrograde cold cardioplegia with potassium plus blood cardioplegia technique was used to provide cardiac arrest and started to distal bypasses with saphenous vein graft. Distal anastomoses were performed on LAD and RCA main coronary arteries. Subsequently, the left atrium was opened, and the 31 no St. Jude biological valve was implanted to the mitral valve annulus without being resected. Atriotomy was closed. Subsequently, anastomoses were performed as between the right saphenous vein graft proximal with the antegrade puncture site and between proximal of saphenous vein graft which was anastomosed to LAD to proximal of the right saphenous vein graft on the ascending aorta under the cross-clamping.

The CPB was terminated following air discharge and bleeding control, and then normalization of hemodynamics and body temperature. Following bleeding control, the drains were placed and layers were anatomically closed. The patient was taken to the intensive care unit of cardiovascular surgery clinic. For a safe surgery, ascending aorta-bisubclavian bypass with a dacron graft was preferred for the continuation of cerebral perfusion. Subsequently, concomitant aortacoronary artery bypass and mitral valve replacement operation were performed.

The patient was in need of vasopressors on the first postoperative day and on the second postoperative day, general health condition of patient was good and then patient was taken to clinical service. Patient's general condition was good and had no complication during follow up. After surgical healing observed the patient was discharged with the medication and recommendations on the 9th postoperative day. He was called for the outpatient clinic control.

DISCUSSION

TA is generally more common in young women than in men and the average age onset is 25 years old in Asia and 41 years old in Europe (2). Although TA has been reported to be approximately 9 times more common in women than in men, there are also reports that men and women are equally affected (8). The first surgical intervention to the coronary artery involvement of TA, which manifested as stenosis of the artery, complete occlusion, formation of aneurysm, enlargement, bending and fistula formation, was performed by Inokuchi in 1961, before the introduction of the aortocoronary bypass technique, by ligation of the bilateral IMA' es of the patient [9]. The number of TA cases was operated for this symptomatic coronary artery involvement from the first intervention to date is less than 100 (10). Most of these patients are Japanese. In addition, approximately one-third of these patients have aortic insufficiency in addition to coronary artery lesions and mitral insufficiency in lesser degrees. The most frequent vessel changes in TA are constriction. Aneurysm and dilatation are rarely observed in TA. Kerr et al. (1) reported that involvement occurs most commonly in

carotid arteries (70%), subclavian arteries being the second most frequent (45%) and the least involvement is seen in femoral (3.3%) and renal (1.7%) arteries. The same researchers reported that the involvement of upper extremities was more frequent than the lower extremities, and that in particular the claudication was more common in adults. Depending on the vascular involvement characteristics of TA in patients undergoing an open heart surgery; monitoring, surgical manipulation and graft selection, surgical technique are important in terms of the postoperative development of neurological sequelae. Ascending aorta involvement can cause problems in surgical manipulations such as cannulation and proximal anastomosis in open heart surgery. In the early postoperative period, saphenous vein graft occlusion may develop due to inflammation of the aorta. However, it is not possible to use IMA in most cases, and early occlusion is reported in proximal anastomoses on dacron grafts.

Cardiac involvement is possible in TA; 70% cardiomegaly, 28% heart failure and 13.6% angina pectoris were reported (11). The main cause of heart failure in TA is secondary to aortic root enlargement. Aorta and its major branches are most commonly affected vessels in TA, in particular with the involvement of aortic arch in the aorta (1,2,8). Aortic arch was normal in our case and total obstruction was detected only in innominate artery and left subclavian artery. The incidence of coronary artery disease is 6-16% in TA (1,2,11,12). The main treatment method in TA is high-dose corticosteroid therapy. Steroid treatment is sufficient for remission in most cases. However, immunosuppressive therapy may be added in case of side effects or high doses of steroids could not be given (2,8,13). Steroid treatment was sufficient for our case since he was in remission period.

Although the inflammatory effect causes some hesitations about the timing of surgery, the type of surgical intervention and the postoperative treatment, the surgical approach in coronary artery involvement in TA is a method with proven effectiveness in present times (14,15). The lesions in the majority of cases are in the ostium or proximal part of the coronary arteries (16). Bypass is necessary in case of advanced arterial stenosis, no response to medical treatment or sudden thrombosis; bypass is performed using methods such as graft operation (vein or artificial), transluminal angioplasty or endovascular stent (1,2,17). The most successful method in TA is autologous vein graft and 36% of artificial grafts are occluded again. In vasculitis, it is recommended first to reduce acute phase responses then invasive procedures after remission provided (2,13,17). There is a possibility of developing aneurysm at the site of the procedure in the active phase and stenosis in the chronic phase due to inflammation. If the patient was in active arteritis period, steroid treatment would have started and waited to enter in remission and then taken into operation.

The outcomes of surgery to the coronary artery involvement in TA improved with the postoperative use of steroids (15). Hypertension, heart failure, myocardial infarction, stroke, aneurysm rupture and renal insufficiency are known as causes of mortality in TA

(1,2,8,11,17). However, it is reported that the 10-year survival rate of treated cases is quite high (80-90%) (1,2,17). Our case has been under follow-up for about 6 months and none of these complications have developed.

CONCLUSION

As a result, in TA; coronary artery occlusions and valvular heart diseases can accompany vascular involvements such as aorta and major branches. Different strategies, depending on clinical and anatomical characteristics in patients who are candidates for open heart surgery, provide the safety. We think that, in patients with remission period of TA, concurrent vascular procedures with open heart surgery can be safely performed for continuation of cerebral perfusion. However, the long-term outcomes of these patients need to be closely monitored to determine the safety, efficacy and durability of this treatment

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