Dysfunction Due to Thrombosis in Bioprosthetic Valves: Case Report

Biyoprotez Kapakta Tromboza Bağlı Kapak Disfonksiyonu

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ABSTRACT In this report, we introduced a patient who has completely normal valve functions in control examinations for over a year, but he had bioprosthetic valve dysfunction postoperative 13th month. A 70 years old man patient was referred to our clinic with complaints of palpitation and breathlessness a year ago. The patient had a third degree aortic regurgitation in his echocardiography report, and his coronary angiography was reported as noncritical stenosis in LAD and circumflex arteries. An aortic valve was replaced in an operation with a bioprosthetic valve. He was completely normal in control examinations over a year. The patient was referred to our clinic with chest pain while walking at postoperative 13th month. Transtorasic echocardiography performed and, the restricted movements and orificial stenosis of the prosthetic aort valve with a thrombus behind the valve were recorded. Coronary bypass surgery was performed after excising of previous valve, and, re-AVR was performed. In this case, we thought that, the organized thrombi and fibrosis formation due to early ceasing of the anticoagulant therapy affected the leaflets of the bioprosthetic aortic valve, and this was the cause of valve dysfunction.

Key Words: Thrombosis; aortic valve; coronary artery bypass

ÖZET Bu yazımızda bir yıllık takipleri normal olan postoperatif 13. ayda biyoprotez kapakta disfonksiyon gelişen bir olguyu takdim ediyoruz. 70 yaşında erkek hasta nefes darlığı ve çarpıntı şikayetleri ile 1 yıl önce kliniğimize başvurdu. Ekokardiyografisinde 3.derece aort yetmezliği saptanan hastanın koroner anjiografisinde nonkritik darlıklar tespit edildi. Hastaya biyoprotez kapak ile aortik kapak replasmanı (AVR) operasyonu yapıldı. Postoperatif 13. ayda yürümekle göğüs ağrısı olan hasta kliniğimize başvurdu. Transtorasik ekokardiyografisinde aortik biyoprotez kapak açıklığı ve hareketleri kısıtlı, aortik biyoprotez arkasında trombüs görüldü. Koroner anjiografide LAD'da darlık saptandı. Hastada biyoprotez kapak eksize edildikten sonra koroner baypası takiben mekanik aort kapak ile re-AVR yapıldı. Antikoagülan tedavinin erken dönemde bırakılmasının yol açtığı fibrosis ve trombüs formasyonunun biyoprotez liflerini etkilediğini düşünüyoruz.

Anahtar Kelimeler: Tromboz; aort kapağı; koroner arter baypas

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Although, mechanical cardiac valves have good long-term durability and low risk of reoperation, their thrombogenic properties are high and, life-long anticoagulant treatment in needed.[1] Lower rates of thromboembolism and pannus formation with lack of requirement for life-long anticoagulant use and, avoidance of the complications due to, are the other advantages of the bioprosthetic valves.[2,3] Central laminar flow on the

bioprosthetic valves provides a larger effective orifice size and less turbulence in blood flow. The decline of left ventricle hypertrophy is more rapid when the valves are mounted in aortic position.[4] These are the features to prefer bioprosthetic valves especially in patients over 70 years old. The use of anticoagulants in the early postoperative period for the patients with bioprosthetic valve is still controversial. Some authors recommend anticoagulant therapy for the first 3 months especially in mitral positioned bioprosthetic valves,[5,6] while others have used to prescribe antiagregant treatment for the same period.[4]

In our case report, we presented a patient with aortic bioprosthetic valve dysfunction in the early midterm period due to inappropriate use of oral anticoagulant therapy.

CASE REPORT

A 70 year old patient was accepted to our clinic with the complaints of palpitation and breathlessness, about a year ago. The patient had a third degree aortic regurgitation in his echocardiography report. And in that time, his coronary angiography reported as noncritical stenosis in LAD and circumflex arteries. An aortic valve replacement surgery was performed with a 23 sized St-Jude bioprosthetic valve. After the operation, anticoagulant treatment with warfarin sodium was started in order to obtain INR level range of 2.5-3 in the postoperative period. But, the patient did not take warfarin regularly because of a prostatic surgery in this early postoperative period. But, regular monitoring of the patient showed us the patient cardiac status was completely normal and, his functional capacity score was 1 at his routine control after a year.

He presented to our clinic with effort dependent chest pain at postoperative 13th month. His ECG showed ST depression and negative T's at V4, V5 and, V6. Transtorasic echocardiography performed and, the restricted movements and orificial stenosis of the prosthetic aort valve with a thrombus behind the valve were recorded. Aortic valve gradient was 60 mm Hg mean and 90 mm Hg max. His coronary angiography revealed two lesions; they were both on the LAD such as 70% stenosis in the proximal segment and 90% stenosis in the mid-portion. A second operation was planned for him to re-replacement of aortic prosthetic valve (reAVR) and to bypass surgery for the lesions of LAD stenosis. In his operation, we observed that both three cuspises of the aortic valve were covered with organized thrombi and expansion of the valve was extremely diminished (Figure 1-3). Coronary bypass was performed after excising the bioprosthetic valve using a saphenous vein graft and reAVR was performed with a mechanical aortic St. Jude valve size of 21. The procedure was ended with no complications.

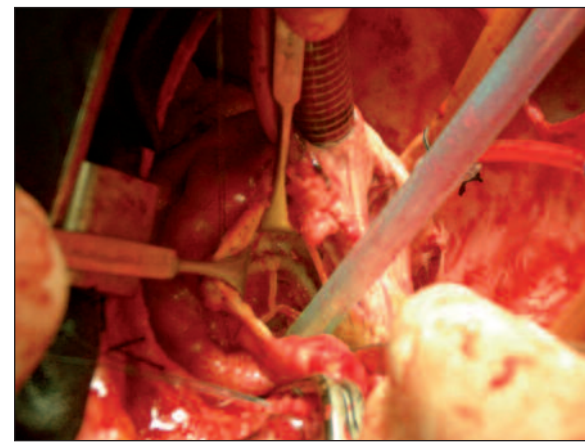

FIGURE 1: Trombus formation on the leaflets after aortotomi incision.
(See color figure at http://cardivascular.turkiyeklinikleri.com/)

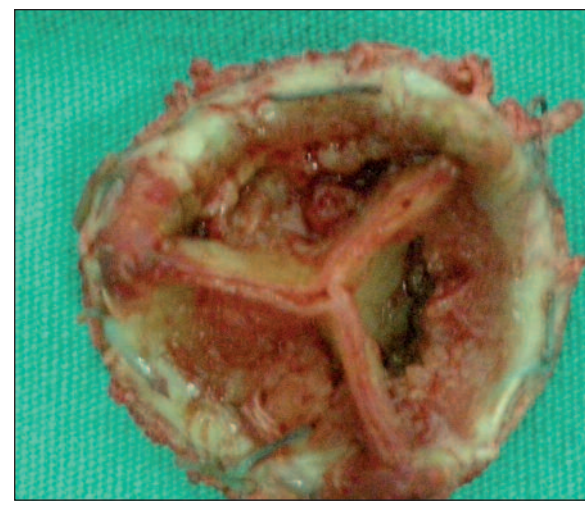

FIGURE 2: Anterior exposure of excised bioprothetic valve.
(See color figure at http://cardivascular.turkiyeklinikleri.com/)

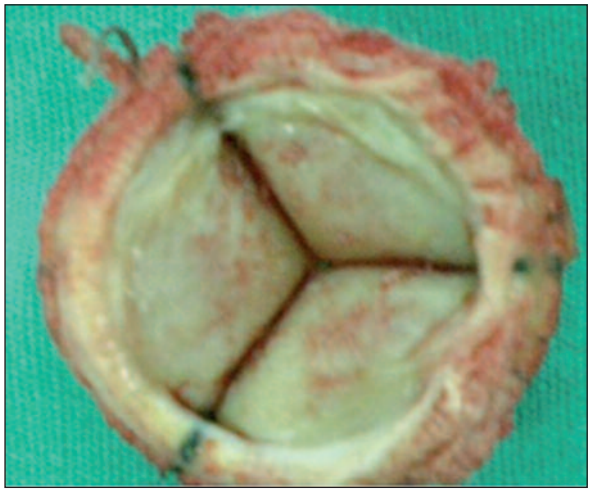

FIGURE 3: Posterior exposure of excised bioprothetic valve.
(See color figure at http://cardivascular.turkiyeklinikleri.com/)

The patient was treated with regular anticoagulant therapy in the postoperative period. And, full functional mechanical valve was identified in his echocardiography report in the 6th postoperative month. The patient is still normal for cardiac functions and has no complaints.

DISCUSSION

Severe bioprosthetic valve thrombosis is rarely seen in clinical practices. Thrombosis appears in mitral position more frequently than aortic position. In routine echocardiographic examinations, the incidence of bioprosthetic valve thrombosis has been reported as 6%.[7] This rate is highest in the first 3 months after replacement.[8] Endothelization of the newly implanted prosthetic and biological material is completed in 3 months and, just because of this, high frequency of thromboembolism is seen in this 3 months period.[9,10] Specific risk factors for thrombosis formation are; wide left atrial diameter, atrial fibrillation, low ejection fraction, previous thromboembolic events, and hypercoagulability diathesis.[1,8] Long-term anticoagulation should be used in the patients with such risk factors.[1]

Heras and colleagues emphasized the importance of reaching therapeutic levels of anticoagulant therapy in early postoperative period to prevent thrombosis and embolic conditions.[5] They specified that the usage of heparin and warfarin at the same time until it reaches therapeutic levels of oral warfarin. However, many authors declared that anticoagulant therapy should be given in the first three months after bioprosthetic valve replacement; some authors still agreed on antiagregant treatment is enough in bioprosthestetic valves, especially in the aortic position.[4-6] We have also prescribed anticoagulant agent to this patient immediately after the surgery, but the patient could not use the agent regularly, because of the need of a prostatic surgery.

In the states of non-obstructive bioprosthetic valve thrombosis, re-operation indication is taken due to the size of thrombus and the development of tromboembolic events. Surgery is recommended if there is a tromboembolic event and the thrombus size is larger than 10 mm.[11] Out of these cases, if the patients are clinically stable, they can be treated only optimized anticoagulant therapy.[1,7] For the patients in high risk group or with severe co-morbid conditions, if there is not thromboembolic event, fibrinolytic treatment may be tried if the thrombus is greater than 10 mm despite of adequate anticoagulation.[6] In our case, re-operation was decided because of the thrombus greater than 10 mm and co-existing coronary artery disease.

As a result, we believe that, the patients should be anticoagulated adequately in addition to antiagregant treatment immediately after the bioprosthetic valve replacement, until obtaining INR levels of 2-3. It is necessary to prevent valve thrombosis, to maintain this treatment at least 3 months in the cases of low risk factors, and lifelong therapy is needed in the patients with high risk factors.

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