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# Aortic Root Abscess with Fistula Formation into Right Ventricular Myocardium

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## *SAĞ VENTRİKÜL MİYOKARDI VE FİSTÜLİZE OLAN AORT KÖKÜ APSESİ*

### *ÖZET*

*Aort kapak endokarditi sonrası gelişen periannuler absenin nadir görülen bir komplikasyonu, aorta ile sağ ventrikül çıkım yolu arasında meydana gelen fistüldür. Periannuler absenin eşlik ettiği infektif endokarditlerin cerrahi tedavisi halen yüksek bir mortalite ve morbidite ile birlikte yapılabilmektedir. 1999 yılında aort kapağını tutan infektif endokarditli 34 yaşındaki hasta 2 aylık antibiyotik tedavisini takiben ciddi aort darlığı ve yetersizliğine eşlik eden aorta-sağ ventrikül arası fistül nedeniyle ameliyat edilmiştir. Aort duvarının ve sağ ventrikül çıkım yolunun rekonstrüksiyonu fistülün rezeke edilerek primer kapatılması ile sağlanmıştır. 23 numara St. Jude mekanik bileflet kapak ile aort kapak replasmanı yapılan hasta halen semptomsuz olarak izlenmektedir. Aort kapağını tutan infektif endokarditin en ciddi komplikasyonu olan fistül tespit edildiği zaman cerrahi olarak onarılmalıdır.*

***Anahtar kelimeler:*** *İnfektif endokardit, aortik kök absesi*

Periannular extension of cardiac valvular infection is a fearful complication of infective endocarditis. Annular abscess, aneurysm or fistulas communication with other cardiac chambers is present in 20-55% of patients with endocarditis [1]. Aortic valve is the most attacked cardiac valve. Aortic root abscess and fistula from aortic root to right ventricular outflow tract is an uncommon, but a very serious complication of infective endocarditis.

## CASE REPORT

In 1999, a 34-year-old man was sent to our clinic for the surgical repair of the significant aortic valve disease and aortic root abscess with associated aortico-right ventricular communication. He was referred from another hospital with palpitation, fewer, weakness, and abdominal pain. Aortic valve endocarditis had been diagnosed after his physical examination and transthoracic echocardiography, but no pathogenic agent had been identified from the blood cultures. Vancomycin and amicacin had been applied for 6 weeks and he had been sent to our clinic for aortic valve replacement. A systolo-diastolic murmur of aortic stenosis and insufficiency was heard on the left border of the sternum. He had splenomegaly (~ 6cm), but the Doppler-sonographic-evaluation showed no abscess in the spleen. Transeosophageal echocardiography revealed vegetation on the aortic leaflets and periannular abscess. The rupture of the left sinus of Valsalva into the right ventricular myocardium was diagnosed below the pulmonary valve. Aortic stenosis (max gradient = 88mmHg) and insufficiency (3°) was associated with a dilated left ventricle (end-diastolic dimension = 62mm), but a normal ejection fraction (70%). Chest x-ray examinations showed moderate cardiomegaly (CTR = 0.65). We followed the same antibiotherapy for 6 weeks more.

He was undertaken to operation after two months from his admission to our clinic. After opening the pericardium, we observed a false aneurysm formation at the left side of the aortic root and a thrill on the surface of this swollen place (Figure-1). A standard cardiopulmonary bypass was set and the patient was cooled to 26°C. Continue retrograde isothermic blood cardioplegia was used for myocardial protection during aortic cross clamping. After opening the aorta, severe aortic stenosis and calcification of the aortic leaflets was observed. Interestingly, a communication between aortic wall and right ventricular myocardium (below the pulmonary valve) had developed through the abscess-sac (Figure-2). The aortic valve was resected and then a radical curettage of the abscess cavity was performed and all infected tissues were removed. The defect at the right ventricular myocardium was small, and so it could be primary closed with two pericardial strip supported 3/0 polypropylene sutures. The defect at the ascending aorta was closed with two pericardial strip supported 3/0 polypropylene sutures. A prosthetic mechanic aortic valve (St Jude, Nº 23) was placed in the aortic annulus using 2/0 polyester sutures. Aortic cross-clamp time was 105 min and total perfusion time was 130 min. The operation was completed with minimal inotropic support. We applied the same antibiotherapy intravenously for three weeks more and discharged him at the first month after the operation. At the second month a control echocardiography was performed and it was observed that the aortic valve was working well without any residual communication between the aorta and the other cardiac chambers.

## DISCUSSION

In infective endocarditis, spread of infection from its usual site on a cardiac valve to the surrounding peri-

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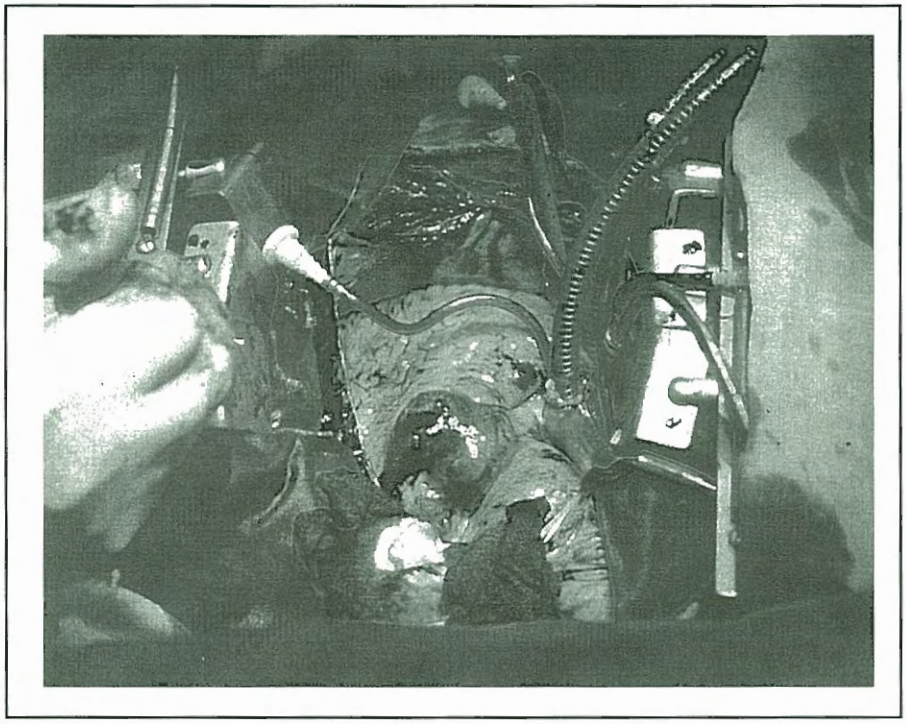

**Figure 1.** View of the false aneurysm formation at the left side of the aortic root

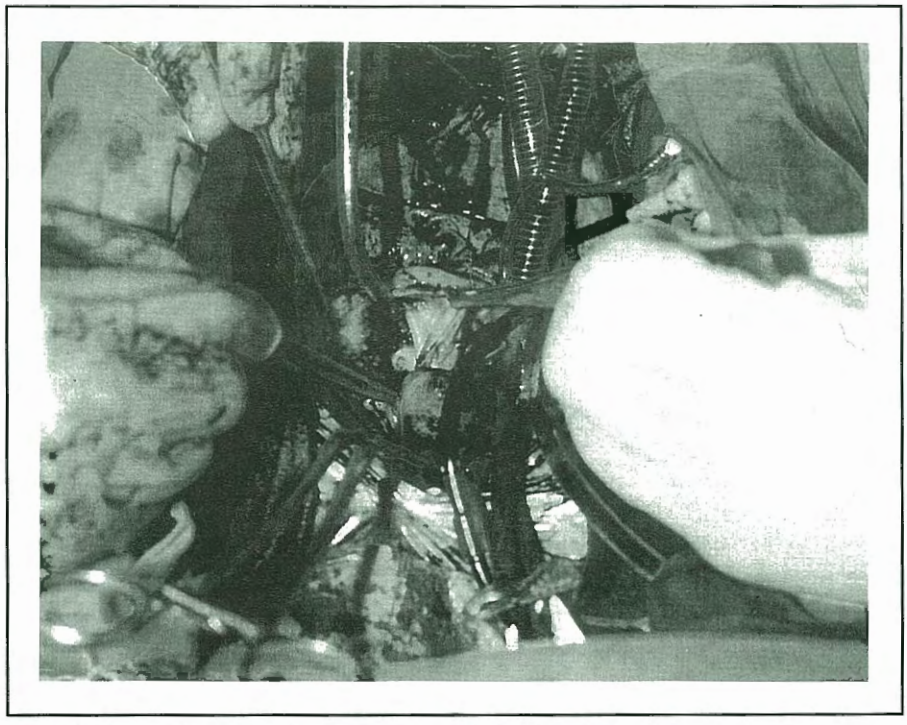

**Figure 2.** View of the fistula orifice after opening of the abscess cavity

valvular structures occurs commonly with aortic valve involvement. The aortic annulus is the most frequently involved structure of the fibrous skeleton of the heart and the most common complication is aortic root abscess with a high prevalence (46%) [3]. The spectrum of annular destruction extends from simple localized annular abscess formation to larger subannular aneurysms with or without perforation into other cardiac chamber [4]. It was found that the relative risk of the developing periannular extension among patients with IV drug abuse was increased by ~ 2.5 fold compared with patients without this characteristic [1,5]. The prevalence of annular destruction in native valve endocarditis is related to the virulence of responsible organism and the duration of process [6]. The most common causing microorganisms are staphylococci and streptococci [7]. The mortality rate of the periannular extension of endocarditis is higher than the native valve endocarditis without any extension. The mortality reasons are arrhythmias, heart block, pericarditis, valve destruction, rupture into the other cardiac chambers or pericardium. Some authors treated the patients with aortic root abscess medically and they found progressive reduction of the abscess cavity dimensions and achieved bacteriological cure with only moderate valve dysfunction [3]. Most of cardiologist and cardiovascular surgeons try to postpone surgery for active infective endocarditis while the patient is in stable circulatory condition and infection is limited. But early

surgical treatment is recommended for patients with infective endocarditis and paravalvular abscess when medical therapy cannot be effective to control the infection [4]. Surgery has been shown to improve prognosis when cardiac failure due to valve dysfunction has set in [8]. We applied medical therapy first for 6 weeks to control the infection and its complications, and then patient was subjected to operation because of the deterioration of the aortic valve function and left ventricular decompensation. Several effective surgical techniques have been described for repair of the aortic annular destruction. It is best to reserve simple plication for only small abscess-cavities, but larger cavities should be treated with one of patch plasty methods [6]. In patients with infective aortic valve endocarditis and extensive annular destruction with partial or complete aortic-left ventricular dehiscence or associated mycotic aneurysm of the ascending aorta, total aortic root replacement should be chosen. The surgical mortality has been reported between 13-26% [3,4,8,9]. Postoperative aortic regurgitation can be a frequent sequel with 20%, but seldom requires a repeat surgery. This is a function of the aortic root deformity entailing a more complex surgical procedure [10]. And as we know, the patients, who had infective endocarditis, are at a higher risk of having a second episode than are those patients who never had it [11].

Paravalvular abscess is often a fatal complication of infective endocarditis and operation should be performed soon after diagnosis. However, the result of operation in these patients is often disappointing because of persistent infections, multiple organ failure, and early or late death [3,4]. This is particularly true when the fibrous skeleton of the heart is extensively destroyed and the reconstructive procedures are complicated and technically demanding. Radical debridement of the abscess and reconstruction of the aortic annulus with fresh autologous pericardium is the best treatment [4]. If the aortic root and wall are intact and they are not extensively destroyed, the radical resection of all infective tissues around the aortic wall can be performed and defects at the aorta and the other cardiac chambers can be closed directly without using any patch. In extensive annular destruction allografts may be the first choice for total aortic root replacement, which have a theoretical and practical advantage (resistance to infection, flexibility, additional periannular tissue) [10,12]. Early identification of periannular involvement might require modifications of antimicrobial regimens, as well as allow for earlier surgical intervention to prevent the disastrous sequel of perivalvular extension of endocarditis.

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