

***Aspergillus* Prosthetic Valve Endocarditis, Brain Abscess and Aortic Root Replacement by Homograft**

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Abstract

A 22-year-old male with history of aortic prosthetic valve replacement 3 months prior to admission was operated on emergently due to prosthetic valve endocarditis (PVE) unresponsive to medical therapy with a large mobile vegetational mass extending to LV. On operation there was a large friable vegetational mass engulfing the mechanical prosthetic valve. The partially detached prosthetic valve and vegetations were removed and aortic root replacement by aortic Homograft and coronaries implantation were performed. The patient was discharged from ICU four days after operation with good condition. The result of two cultures from the prosthetic valve was *Aspergillus*. Amphotericin-B was started and all other antibiotics were discontinued. The patient remained afebrile and in good condition but CT scan of brain revealed three SOL in frontal and occipital lobes. This case suggests that early and proper surgical treatment may reduce the risk of complications and mortality. (*Iranian Heart Journal*. 2002; 2(4) & 3(1): 62-65)

Key words: < *Aspergillus* < prosthetic valve endocarditis < aortic homograft

Despite major advances in cardiovascular surgical technique and post operative care and routine use of prophylactic antimicrobial agents, prosthetic valve endocarditis (PVE) continues to complicate the course of small percentage of patients after cardiac valve replacement. *Aspergillus* PVE is a serious but infrequent cause of fungal PVE and about one third of fungal endocarditis is due to *Aspergillus*.¹ Characteristic features of *Aspergillus* endocarditis include an association with cellular immunodeficiency, extensive emboligenic endocardial lesion, and a marked predilection for prosthetic valves and a frequently fatal outcome despite early optimal mediosurgical treatment. Mortality

rates in patients with isolated *Aspergillus* endocarditis have ranged from 80% to 96%.²

Case Report

A 22 years old male with history of AVR three month prior to admission presented with fever, malaise and admitted to the hospital with diagnosis of unresponsive endocarditis after 7 days of antibiotic treatment and on echocardiographic study there was a mobile and large (2.5 cm) vegetational mass with extension to the left ventricle and redo-operation on an emergency basis was performed [Fig. 1].

Fig. 1. Echocardiography demonstrating mobile mass.

There was a partially detached monoleaflet prosthetic valve engulfed by large vegetational mass extending to the left ventricle by a 2.2 cm round and mobile mass. The prosthetic valve and vegetation was removed and extensive debridement was carried out. A size 23 aortic homograft was recruited as a conduit and aortic root replacement with coronary implantation was performed and because of size mismatch and large annulus, reductive tailoring of annulus was done before insertion of the graft [Fig 2].

Fig. 2. Postop echocardiography demonstrating aortic homograft.

The patient was discharged from ICU on 4th postoperative day with good condition. A brain CT scan was carried out due to the episodes of recent memory loss and revealed three SOL in frontal and occipital lobes [Fig.3, 4].

Fig. 3. Brain CT scan showing a large abscess in the right frontal lobe.

Fig. 4. CT scan showing lesions in the frontal and occipital lobes.

The result of culture from removed prosthetic valve was positive for *Aspergillus* for two times by two different laboratory exams [Fig. 5]. Amphotericin-B was started and other antibiotics were discontinued and patient stayed afebrile and symptom free for two months after operation.

Discussion

Fungi account for about 1% of all cases of endocarditis. Two-thirds of cases of fungal endocarditis are due to *Candida*, and one third to *Aspergillus*. Characteristic features of *Aspergillus* endocarditis include an association with cellular immunodeficiency, extensive emboligenic endocardial lesion, a marked predilection for prosthetic valves, and a frequently fatal outcome despite early, optimal medico-surgical treatment. The increased use in recent years of organ transplantation and aggressive anticancer chemotherapy has translated into a rise in incidence of *Aspergillus* endocarditis. Native valve disease is far less common than prosthetic valve disease. Concomitant presence of a clinical pulmonary focus is exceedingly uncommon. *Aspergillus* endocarditis is often caused by contamination during heart surgery.³ The risk is being particularly high when extracorporeal circulation is performed⁴ and when valve replacement⁵ or repair⁶ is performed. A tiny proportion of cases⁷ occurs in the absence of heart surgery, by hematogenous dissemination of *Aspergillus* to the healthy native valves of patients with profound immunodeficiency. The most striking clinical feature of *Aspergillus* endocarditis is a high risk of recurrent embolization from the large and friable fungal vegetations.⁸ As seen often in the course of *Aspergillus* endocarditis, all 6 blood cultures prepared from the present patient were negative. However negative results of blood cultures for bacteria and yeasts (particularly in immunocompromised patients) call to mind aspergillosis.

Treatment should be started as soon as the diagnosis is made. Both antifungal agents and surgery should be used whenever possible, although a very small number of debilitated or inoperable patients have recovered under antifungal therapy alone.⁹

Fig. 5, (A-D). Histopathology slides revealing *Aspergillus* species.

Amphotericin B is the most often used agent; the dosage is 1 mg/ kg with the conventional form or 5-mg/ kg with the liposomal form^{10,11} for a period at least 12 weeks. Amphotericin B is sometimes used in combination with 5-fluorocytosine (1.5g/day). Once optimal antifungal therapy has been initiated, the infected valve should be replaced as early as possible.¹² All infected tissues should be removed, since antifungal agents show little or no penetration within vegetations.¹³ The valve is usually replaced by mechanical prostheses in mitral position but in aortic position, which is less common, Homograft is preferred choice because of definite advantage of absence of early relapse phase.¹⁴ Homograft replacement can be done either in subcoronary inclusion technique or aortic root replacement with coronaries implantation and we chose the latter due to advanced involvement of aorta and annulus.

Mortality rates in patients with isolated *Aspergillus* endocarditis have ranged from 80% to 96%. The frail health of the patients, recurrent sever embolism and diagnostic delays were major contributors to mortality. In our patient in spite of normal recovery and acceptable postoperative cardiologic course, two medium size encapsulated brain abscess remained unresolved for possible further neurosurgical intervention [Fig.3] and this emphasizes less procrastination and more radical surgery.

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