Aspergillus Endocarditis in Association with a False Aortic Aneurysm


* †South-East Thames Regional Cardiothoracic Unit, Brook General Hospital, †Brompton Hospital, and †St. Mary's Hospital, London, England

Summary: A 32-year-old man was admitted with an intracerebral hematoma and subsequently with bilateral femoral emboli five months after aortic valve replacement. Blood cultures for bacteria and fungi were negative but microscopy of the embolus revealed Aspergillus fumigatus. At operation a large false aneurysm of the ascending aorta and vegetations on the prosthetic aortic valve were found. Aspergillus endocarditis is diagnosed antemortem in only 23% of fatal aortic aneurysms: blood cultures are positive in only 8%. Clinically a large vessel embolus is characteristic, being present in 83% and microscopy and culture of such an embolus if present are vital investigations.

Key words: endocarditis, Aspergillus fumigatus, embolism, aneurysm, aorta ascending, heart valve prosthesis

Case Report

A 32-year-old man first presented with hemoptysis and exercise intolerance. He had an ejection systolic murmur. Cardiac catheterization confirmed a diagnosis of aortic stenosis with a gradient of 70 mmHg across the aortic valve. At operation a tricuspid aortic valve with fusion of all commissures was found. Aortic valve replacement with a Starr-Edwards prosthesis was carried out. He subsequently had low-grade pyrexia for 10 days postoperatively but this resolved three days before discharge.

He presented again five months later, when his family noticed that he had become more withdrawn and he suddenly complained of weakness of the left side of his body and face. He was apyrexial with no nail clubbing or splinter hemorrhages. A left dorsalis pedis pulse could not be felt, but all other peripheral pulses were present. Auscultation of his heart revealed normal sounds of a prosthetic aortic valve with no aortic regurgitation. His fundi were normal. He had an upper motor neurone weakness of the left side of his face, a grand four weakness of his left arm and leg, and his spleen was not palpable. A computerized tomography brain scan revealed a large frontal intracerebral hematoma. His British Comparative Ratio (BCR) at this time, while on warfarin, was 3.9. As his conscious level continued to fluctuate, the hematoma was evacuated and he made an excellent recovery. During this admission he had pyrexia, his hemoglobin was 14.6 g/l,
white cell count $17.5 \times 10^9/\text{l}$, erythrocyte sedimentation rate 26 mm/h, and a midstream urine specimen grew *Escherichia coli*. He was treated with ampicillin with excellent recovery. His pyrexia resolved and an echocardiogram revealed no vegetations on the prosthetic valve.

Five weeks later he was admitted complaining of a sudden pain in his right calf which was worse on walking. His right thigh and calf were tender but there was no swelling. All peripheral pulses were present. A venogram was normal and his BCR was 3.8.

Three weeks later he was readmitted with pain, paraesthesiae, numbness, and weakness in both calves and feet of sudden onset. The only pulse palpable in the legs was a weak right femoral pulse. He had otherwise been feeling well and had been fully anticoagulated. He had used cocaine, but there was no history of other drug abuse. He underwent bilateral femoral embolectomy. His temperature was 39.0°C and his finger nails revealed three splinter hemorrhages, there was a flame-shaped retinal hemorrhage in his right eye, and microscopic hematuria. Pulse was 132 regular, with a fast upstroke, the apex beat was displaced to the anterior axillary line, and auscultation of his heart revealed an ejection systolic murmur in the aortic area but no diastolic murmur. There were bilateral inspiratory crepitations at both lung bases but jugular venous pressure was not raised and there was no peripheral edema. His hemoglobin was 9.9 g/l, white cell count $15.8 \times 10^9/\text{l}$, and erythrocyte sedimentation rate 98 mm/h. An electrocardiogram revealed sinus tachycardia and chest x-ray cardiomegaly, upper lobe diversion, and a small left-sided pleural effusion. Echocardiogram was normal. Blood cultures were taken for bacteria and fungi after which he was started on ampicillin and flucloxacillin. His temperature increased to 39.9°C, but urine, throat, and blood cultures were negative; a mouth swab revealed *Candida albicans*. His right leg became painful, cold, pale, and pulseless; thus right femoral embolectomy, endarterectomy, and vein patch were performed. Microscopy of the embolus revealed *Aspergillus* species. He was started on amphotericin (250 g/kg/day) and fluycitosine (2.5 g 4 times a day); within two days he became apyrexial. *Aspergillus fumigatus* was grown on culture.

He developed chest pain eight days after admission with electrocardiographic evidence of ischemia and ventricular tachycardia and fibrillation. These were treated with direct current cardioversion and lignocaine. He was taken to the cardiothoracic operating theaters for aortic valve replacement where he again developed ventricular tachycardia and fibrillation. After lengthy resuscitation he was placed on the operating table, but unfortunately, died due to uncontrollable hemorrhage from a false aortic aneurysm, which was $10 \times 4 \text{ cm}$ and communicated with the aorta over its anterior aspect 3 cm above the level of the Starr-Edwards prosthesis (Fig. 1). There were large vegetations arising from the sewing ring of the prosthesis and a recent myocardial infarction (Fig. 2). The lungs were edematous but contained no cavities or evidence of aspergillus infection.
Discussion

Previous reports\(^3\)\(^-\)\(^5\) of *Aspergillus fumigatus* prosthetic valve endocarditis have emphasized both the difficulty in diagnosis antemortem and the almost uniformly fatal outcome. Most patients have been relatively young and not obviously immunocompromised. The disease typically presents late after the valve operation; in the series of Petheram and Seal,\(^4\) for example, all patients but one had been discharged from hospital after valve replacement apparently well and presented again within 41 to 103 days later with a spectrum of symptoms eventually attributed to *Aspergillus fumigatus* endocarditis only after postmortem culture of the organism from vegetations on the prosthetic valves. Once clinical symptoms became apparent, however, the disease pursued a rapid and relentless course, usually with a fatal outcome. The most common clinical features are those attributable to prosthetic valve dysfunction: cyanosis, hypotension, and left ventricular failure, as in our patient. The appearance of new cardiac murmurs is also common, but not invariable. Also common are features attributable to thrombosis of medium to large arteries, particularly the spleen and kidneys and, as in this case, the limbs. Fever is a variable feature and may be minimal or absent. Polymorphonuclear leukocytosis is a relatively common but nonspecific finding. Isolation of the organism from culture of venous blood on specific fungal culture is exceptional: Kammer and Utz\(^3\) were able to isolate the organism in only 3 of 37 cases while in the series of Petheram and Seal,\(^4\) fungal blood cultures were in all cases sterile. Fungus can often be identified by light microscopy or culture of arterial “thrombi” (which are more properly fungal emboli) when accessible, as in the present case, which emphasizes the importance of such a procedure in diagnosis. This difficulty in isolating the organism by blood culture is in marked contrast to the situation in bacterial and candida endocarditis.\(^6\) Also specific aspergillus precipitins do not seem to appear in the serum of infected patients.\(^4\)

In common with other reports, our patient presented relatively late after valve replacement following a period of apparent well being. Despite this, most authors agree\(^3\)\(^-\)\(^7\) that infection of the prosthesis most probably occurs during the valve replacement operation from fungal spores contaminating the operating theater air. Other possible reported sources include inadvertent intravenous administration of solutions contaminated with fungus and dissemination from a clinically and radiographically occult focus in the lung.\(^9\)

Aneurysms of the aorta in association with aspergillus endocarditis are relatively unusual, and as far as we are aware, this is the first case described of a false aortic aneurysm in the context of this disease. Although some authors\(^10\) consider all mycotic aneurysms to be false, the only other report\(^4\) of which we are aware describing an aneurysm of the ascending aorta in association with *Aspergillus fumigatus* endocarditis clearly shows that in this case the aneurysm was a true saccular one. Brandt et al.\(^11\) recently described *Aspergillus fumigatus* infection of a Dacron aortic bypass graft causing a pseudoaneurysm around the graft, but there was no evidence of endocarditis in this case (the patient did not have a prosthetic valve). Similarly, in a recent series\(^12\) of patients with mycotic aneurysms complicating bacterial endocarditis, the majority of aneurysms were true aneurysms with a recognizable wall. It is of interest that most of these aneurysms appeared relatively late, up to six months, after symptoms attributable to the endocarditis.

We hope that this short report reemphasizes the difficulty in diagnosing Aspergillus endocarditis, the need for a high index of clinical suspicion in the context of a specific constellation of clinical symptoms and signs, and the value of microscopy and culture of peripheral emboli wherever this is possible.

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References