Prosthetic valve infection caused by Paecilomyces lilacinus

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ABSTRACT

Paecilomyces lilacinus is an environmental mold, which is found worldwide in soil and on decomposing vegetation. It is emerging as an important fungal pathogen reported from various parts of the world like Europe, America, Middle east etc. Though very rarely pathogenic in humans, there are, however few case reports of pulmonary infections, sinusitis, abdominal wall abscess, ocular infections, dermatologic infections and deep soft tissue abscess. We report the first case of *Paecilomyces lilacinus* prosthetic valve infection in an immunocompetent patient. He came with the complaints of chest pain, breathlessness and pain in left groin. Echocardiography revealed bioprosthetic aortic valve with dehiscence. Carotid doppler showed bilateral intimal thickening and peripheral doppler revealed embolism in left saphenofemoral artery. Patient underwent redo aortic valve replacement and left femoral embolectomy. His aortic tissue and femoral embolus was sent to the microbiology lab. Direct microscopy using potassium hydroxide showed hyaline septate fungal hyphae and culture grew *Paecilomyces lilacinus* after 2 weeks. The isolate was found to be susceptible to amphotericin B (MIC 0.125 µg/ml), caspofungin (MIC 0.125 µg/ml), posaconazole (MIC 0.125 µg/ml) and voriconazole (MIC 0.006 µg/ml). Though this species is more resistant to antifungal drugs but our isolate was sensitive and patient was successfully treated with amphotericin B and voriconazole.

Keywords: Paecilomyces lilacinus, Prosthetic valve.

Key Messages: Paecilomyces lilacinus is a saprobic mold, but now emerging as an important cause of prosthetic device infection

INTRODUCTION

We report a case of *Paecilomyces lilacinus* prosthetic valve infection in an immunocompetent patient. To our knowledge, this is the first reported case of isolation of Paecilomyces lilacinus from cardiac valves. The patient underwent aortic valve replacement and was successfully treated with amphotericin B followed by voriconazole.

CASE HISTORY

A 67 year old, nondiabetic, normotensive, hypothyroid male with a history of aortic valve replacement in 2008 was referred to the emergency dept in May 2013. He presented with complaints of chest pain, radiating to the left forearm, breathlessness on exertion, episodic chills and pain in the left groin for the last 5-6 days.

On examination, patient was hemodynamically stable. His pulse was 84/min, Blood pressure was 130/70 mm Hg. Ultrasonography chest revealed bilateral pleural effusion with underlying atelectasis. Echocardiography revealed bioprosthetic aortic valve with dehiscence and significant paravalvular aortic regurgitation. A small mobile stricture suggestive of vegetation was seen. Ascending aorta was dilated and there was mild mitral and tricuspid regurgitation. Left ventricular ejection fraction was 55% but right ventricular systolic function was normal. Carotid doppler revealed bilateral intimal thickening and peripheral doppler showed embolism in left sapheno femoral artery. Patient

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Figure 1: Colony appearance of pacilomyces lilacinus on SDA

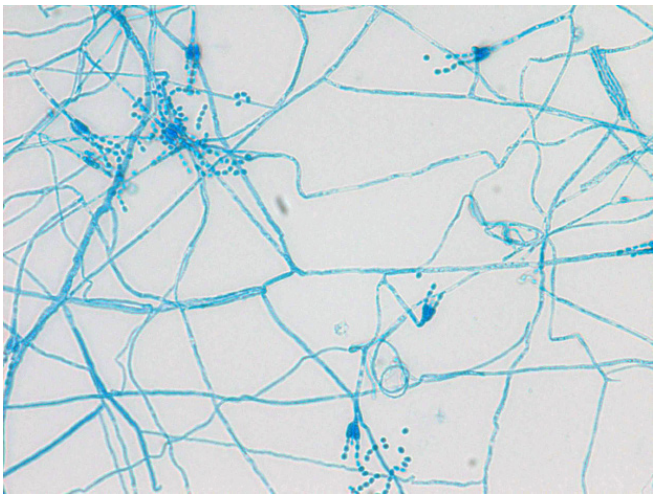

Figure 2: LCB (Lactophenol Cotton Blue) mount of the Colony (400 X)

underwent redo aortic valve replacement and left femoral embolectomy on the 3rd day of admission. Post operative echocardiography revealed normally functioning prosthetic heart valve at aortic position. Ultrasonography chest showed bilateral pleural effusion for which appropriate antibiotics were given. Aortic tissue and left femoral embolus was sent to microbiology lab for KOH and fungal culture. KOH revealed hyaline septate fungal hyphae in both the specimens. Fungal culture was done on Sabouraud dextrose agar which grew flat white powdery colony with red brown reverse initially, turning lilac in colour within 1 week of incubation (Figure 1). Microscopically it showed characteristic phialides which were elongated, tapered and ended in elliptical conidia. Identification of *Paecilomyces lilacinus* was made based on microscopic and macroscopic features (Figure 2). Antifungal susceptibility test was done using the broth microdilution technique. The isolate was found to be susceptible to amphotericin B (MIC 0.125μg/ml), caspofungin (MIC 0.125 μg/ml), posaconazole (MIC 0.125 μg/ml) and voriconazole (MIC 0.006 μg/ml). Patient was started on amphotericin B 150 mg IV once daily. The patient improved and was discharged in a stable condition with an advice to continue on antifungals for 6 weeks. Patient was readmitted after 1 month with complaints of pain in the left calf and left great toe. Arterial doppler revealed thrombotic occlusion of left sapheno femoral artery. Echocardiography revealed normally functioning prosthetic valve free from vegetations at the aortic position. After proper evaluation and anaesthesia clearance, the patient underwent left femoral thromboembolectomy with interposition graft between sapheno femoral artery & common femoral artery. Voriconazole was added along with amphotericin B initially for 3 weeks after which only voriconazole was continued. Post operatively, he developed spikes of fever with chills. His blood culture grew *E. coli* and pus from surgical site grew *Klebsiella pneumoniae* for which appropriate antibiotics were given. Fungal culture of the thrombotic tissue grew *Paecilomyces lilacinus* after 2 weeks. Patient subsequently improved and was discharged in stable condition with an advice to continue oral voriconazole 200 mg twice daily

DISCUSSION

Paecilomyces lilacinus is a saprobic mold, which is found worldwide in soil and decomposing vegetations and can cause serious infections in immunocompromised patients. Paecilomyces was originally classified as a Penicillium and *Paecilomyces lilacinus* was known as *Penicillium lilacinum*. In 1974, Samson proposed that it should be reclassified as a member of the Paecilomyces genus.[1]

Paecilomyces lilacinus is emerging as an important pathogen that is able to cause severe cutaneous and sub-cutaneous infections.The majority of published case reports of *Paecilomyces lilacinus* infections involve the eye. It can cause devastating endophthalmitis and keratitis. The bulk of endophthalmitis cases are associated with intraocular surgery, trauma and intraocular lens implantation.[2-8] Besides endophthalmitis and keratitis, there are also published case reports of infected corneal transplant and orbital granuloma.[9,10]

Cutaneous mycosis is the next common form of infection caused by *Paecilomyces lilacinus*. It has variable clinical manifestations ranging from macule, papule,

pustule to deep cellulitis and subcutaneous nodules.[11,12] Majority of cases described in the literature involve immunocompromised patients but there are cases of dermatological manifestations in immunocompetent individual also. Takayasu et al demonstrated this fungus in a 20-year-old woman who had erythematous scaly plaques persistent for 15 years on the left cheek.[13]

Other published case reports of *Paecilomyces lilacinus* infection include chronic maxillary sinusitis, pulmonary mycosis, catheter related fungemia, abdominal wall abscesses.[14-18] Important pathogenic Paecilomyces species other than *Paecilomyces lilacinus* are *Paecilomyces variotii* and *Paecilomyces marquandii*.[19]

It is clinically important to identify this fungus upto species level because of variation in susceptibility pattern among different members of this genus. In contrast to the other species, *Paecilomyces lilacinus* is more resistant to antifungal drugs flucytosine and amphotericin B. Overall voriconazole has shown better outcome as compared to older antifungals like amphotericin B, flucytosine, fluconazole but there are published reports where *Paecilomyces lilacinus* infection have been successfully treated with amphotericin B.[17,20] In our case also, this fungus was successfully treated with amphotericin B and voriconazole. Outcome of the disease varies from complete recovery to death, according to literature. Favourable outcome have been observed in 28.3% cases in ocular infections, 73.3% in case of cutaneous infections. Better prognosis have been observed in non ocular, non cutaneous infections. In many cases surgery have been successfully combined with antifungals.[21] To summarize, we report a case of *Paecilomyces lilacinus* prosthetic valve infection in an otherwise healthy patient where valve replacement and antifungal therapy with amphotericin B and voriconazole was successful in treating the patient.

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