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Aneela Hussain  
*Aga Khan University*

Nosheen Nasir  
*Aga Khan University, nosheen.nasir@aku.edu*

Bushra Jamil  
*Aga Khan University, bushra.jamil@aku.edu*

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## CASE REPORT

# AN UNUSUAL PATHOGEN CAUSING NATIVE VALVE ENDOCARDITIS

**Aneela Hussain, Nosheen Nasir, Bushra Jamil**

Section of Adult Infectious Diseases, Department of Medicine, Aga Khan University, Karachi-Pakistan

We present the case of a gentleman who was being evaluated for restrictive lung disease and was incidentally found to have mitral valve stenosis on an HRCT. During the surgical procedure for valve replacement, he was found to have an abscess around the native mitral valve which was drained. Pus from the abscess as well as the valve tissue grew *Propionibacterium acnes* after holding the cultures long. The patient was treated with IV ceftriaxone with good response to therapy. While *Propionibacterium acnes* is known to cause prosthetic valve infections there are rare case reports with native valves. This is the first case to be reported from our country.

**Keywords:** Endocarditis; *Propionibacterium acnes*; Valvular disease; Mitral valve replacement

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## INTRODUCTION

*Propionibacterium acnes* (*P. acnes*) is part of the normal flora on the skin and is associated with acne vulgaris. It is also found in oral cavity, large intestine, and ear canal.<sup>1</sup> Infective endocarditis is a very serious condition in which the usual organisms are *Streptococci*, *Staphylococci*, *enterococci* and HACEK organisms.<sup>2</sup> *P. acnes* has been reported to cause infection of prosthetic devices with native valve involvement in only a few case reports.<sup>3–6</sup> Our case is a young diabetic individual with an incidental finding of a perivalvular abscess intra-operatively which grew *P. acnes* after prolonged cultures of tissue.

## CASE REPORT

The patient was a 35 years old gentleman with known co-morbidities of type II diabetes mellitus and vitamin B12 deficiency. He had been having shortness of breath and cough for 15–20 days for which he was taking inhalers. He had also taken a short course of Moxifloxacin for presumed lower respiratory tract infection. However, the symptoms continued to worsen and he consulted a pulmonologist who had an HRCT done as his chest x-ray and chest examination were unremarkable. There was an incidental finding of a heavily calcified mitral valve and normal lung fields on the HRCT. An echo was done confirming severe mitral valve stenosis with dilated left atrium and he was referred to cardiothoracic surgery for mitral valve replacement. During the procedure the surgeon found an abscess around the mitral valve which was 3×3 cm. It was drained and pus cultures and valve tissue cultures were sent and the valve was replaced. He was initially started on Vancomycin and ceftriaxone empirically. His blood cultures as well as pus cultures were reported negative after 5 days. However we requested the microbiology department to hold cultures for another week on suspicion of a slow growing organism and so they were held for total 14 days. Valve tissue cultures grew *P. acnes* which was sensitive to ceftriaxone. The

patient was discharged home on IV ceftriaxone 2 gm QD. We have been following this patient for 4 months after discharge. His CRP was 5.1 during admission which became 2.2 on discharge and 0.2 after 6 weeks and 0.07 after 8 weeks and completion of therapy. On subsequent follow ups for the next two months the patient has remained afebrile with improvement in shortness of breath and general wellbeing.

## DISCUSSION

*Propionibacterium acnes* is a fastidious, aerotolerant, anaerobic gram positive rod with a wide spread habitat in nature. In humans it resides mostly in the sebaceous glands of the skin, ear canal and conjunctiva. It is notorious for causing acne but also a known cause of a variety of infections in the presence of prosthesis like involvement of prosthetic joints, pacemakers, prosthetic valves, vascular grafts, intracranial shunts and also breast implants.<sup>1,3,7</sup> There have been rare case reports in literature of *P. acnes* causing native tissue involvement as well, including endophthalmitis, chronic prostatitis, dental infections, parotid infections, scalp pustules and native valve endocarditis.<sup>1,6–8</sup>

There is a propensity of this organism to cause a smouldering, on going infection based on its cytotoxic and tissue degrading properties, an aftermath of its enzymes like lipases, hyaluronidases, endoceramases, and haemolysins. Not only these enzymes but it also has an efficient lipoglycan cell envelope which helps *P. acnes* in clinging onto surfaces facilitating biofilm formation and adding onto its virulence.<sup>1,7</sup>

Anaerobes have been associated with infective endocarditis very rarely with only 2–16% cases ever isolated in the last 30 years.<sup>9</sup> Most cases of anaerobic endocarditis include *P. acnes*.<sup>9</sup>

*P. acnes* endocarditis is usually a chronic, sub-acute infection with minimal symptoms, however, acute fulminant infections have also been reported leading to septic shock.<sup>9</sup> A case of an aggressive endocarditis in a healthy gentleman involving the aortic root and forming an abscess was reported by Mohsen *et al.*<sup>5</sup> The result of

*P. acnes* endocarditis is usually valve dehiscence and intra cardiac abscesses usually at the aortic root in 52% cases in prosthetic valve and 15% cases in native valve.<sup>6,11</sup> With around 28.6% cases leading to an abscess<sup>3,9,12</sup> apart from abscess formation, congestive heart failure and vegetations on valve leaflets were other manifestations of this endocarditis.<sup>9</sup> Male sex is considered a risk factor.<sup>3</sup> Native valve endocarditis by *P. acnes* is to date a rare phenomenon with only 14 reported cases in literature.<sup>9</sup> A common occurrence was of most of the reported cases was the character of this organism to be easily missed in blood cultures or being mistaken for a contaminant which led to progression of the infection towards heart failure and septic emboli.<sup>9,14</sup> Therefore, *P. acnes* when isolated should not be disregarded in the appropriate setting.<sup>13</sup> Due to its lagging growth pattern it is advised to hold cultures for 14–21 days, and in case of tissue cultures, to grind the specimen.<sup>8</sup> The other risk factors predisposing to native valve endocarditis were found to be congenital heart diseases, previous surgeries, trauma, malignancy, immuno-deficient states and diabetes mellitus.<sup>3,13</sup> There have been cases of *P. acnes* endocarditis in Rheumatic heart disease but these too there was immunosuppressed state.<sup>2</sup> Our patient had diabetes mellitus which was controlled on oral hypoglycaemic medications but did not report any other comorbid states.

Despite a chronic infection pattern and at times devastating outcomes, this organism has a good sensitivity profile with susceptibility to a wide range of anti-bacterial medications including Beta lactams and cephalosporins.<sup>3</sup> Of note is that all of the reported cases had a Beta lactam sensitive isolate with a few cases showing resistance patterns with clindamycin and erythromycin.<sup>13</sup> However, surgical interventions are needed in almost 81% cases.<sup>4</sup> The mortality rate approaches 15–27% if not treated timely and appropriately.<sup>4</sup> Although there has been one case report in which the patient opted out of a surgical procedure and improved only on ceftriaxone and rifampicin.<sup>15</sup> The fulminant and acute pattern in a few cases point to a yet elusive nature of this pathogen.

A case series from Poland, of native valve endocarditis, in two patients found good results with management with a penicillin and clavulanic acid combination.<sup>16</sup> The total duration of antibiotic treatment is from 4–6 weeks even though the inflammatory laboratory parameters improve in 2–3 weeks.<sup>17</sup> This case report emphasizes the importance of *P. acnes* in causing infective endocarditis in native valves and also the significance of holding blood cultures and tissue

cultures for at least two weeks in cases where no organism was isolated.

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### Address for Correspondence:

Aneela Hussain, Section of Adult Infectious Diseases, Department of Medicine, Aga Khan University-Karachi-Pakistan

Email: doc.aneela@yahoo.com