

# Cardiac Magnetic Resonance Imaging for Detection of an Abscess Associated with Prosthetic Valve Endocarditis: A Case Report

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## ABSTRACT

*Propionibacterium acnes* is an organism frequently isolated in cultures and often dismissed as a contaminant. A patient with a febrile illness and prosthetic aortic valve was suspected of having infectious endocarditis. Magnetic resonance imaging was useful in defining a paravalvular abscess associated with prosthetic valve endocarditis due to *Propionibacterium acnes* that was then successfully surgically repaired.

## INTRODUCTION

The detection of infectious endocarditis in cases of negative blood cultures relies on the use of transesophageal echocardiography (TEE). In the case presented, a patient with a history of a prosthetic aortic valve replacement was found to have an abscess that was suggested by echocardiography but best visualized by cardiac magnetic resonance imaging (MRI). Ultimately, blood cultures returned showing *Propionibacterium acnes* (*P acnes*), a common skin organism that is frequently dismissed as a contaminant, but which can have a virulent course, particularly in patients with pre-existing cardiovascular disease. Thus cardiac MRI was critical in establishing the diagnosis leading to appropriate therapy.

## CASE REPORT

A 46-year-old man presented with progressive dyspnea of 3 months duration and intermittent fever over 6 weeks. Blood cultures held 6 days were negative. Three weeks prior to admission, he had recurrence of fever and chills, which did not resolve on oral antibiotics. Blood cultures again were negative. He was admitted and treated with vancomycin, ceftriaxone, and gentamicin prior to referral to our institution.

His past medical history included aortic valve replacement at age 37 following endocarditis at age 15. The patient had a

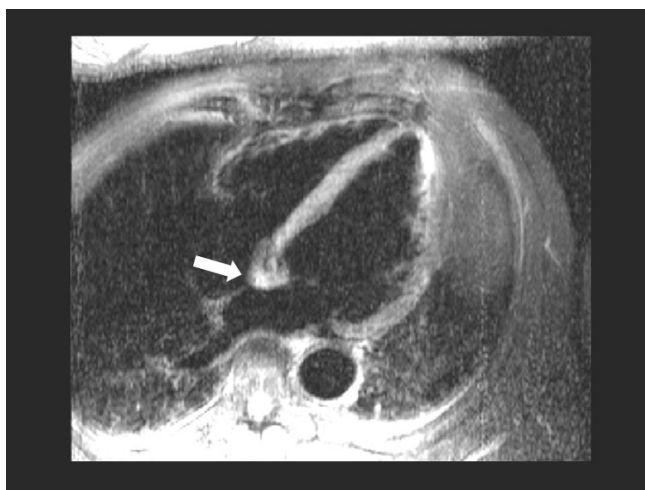
cardiomyopathy with a left ventricular ejection fraction of 30%. He had received dental cleaning 3 months before admission with appropriate antibiotic prophylaxis. He also had a history of acne rosacea, with recent electrosurgery for telangiectasia, and had noted an acneiform facial abscess just prior to symptom onset.

On admission, he was afebrile with a pulse of 90, respiration of 16, and blood pressure of 100/65. The patient looked well with crisp prosthetic valve sounds and a II/VI systolic ejection murmur. The remainder of the examination was unremarkable. Laboratory data revealed a white blood count of 9.7 per mm<sup>3</sup>. An electrocardiogram showed normal sinus rhythm with first-degree atrioventricular block and a left bundle branch block. A TEE showed a 1.4 × 1.5-cm mobile echodensity on the ventricular side of the aortic valve with echolucency noted on the posterior aortic root suggestive of an abscess. Mild aortic insufficiency was noted. Due to difficulties in visualization of the root by TEE, cardiac MRI was performed. A T2-weighted fast spin echo sequence was used to both minimize artifacts from the prosthesis and to evaluate the potential of a ring abscess. This was clearly seen as a bright fluid-filled structure surrounding the aortic valve that extended into the interventricular septum (Figure).

On surgical exploration, the valve was dehiscenced and held in place by a single stitch. Multiple annular abscesses were noted, as were vegetations along the interventricular septum and the anterior leaflet of the mitral valve. The prosthesis appeared held in place by a single suture. A 24-mm Cryolife homograft valve (Kennesaw, GA, USA) was implanted. To control bleeding due to a significant coagulopathy, the chest was packed with sponges and was left open. Two days later, he was returned to the operating room for exploration and closure. Perioperatively, he required high-dose vasopressors for hemodynamic support as well as ventilatory support for several days but ultimately improved. Gram stain revealed beaded, branching, gram-positive filamentous bacilli. *P acnes* grew from the prosthetic valve culture on day 15 of incubation. Cultures held 4 weeks were negative, although they were obtained after antibiotics were initiated at the other hospital. The patient received penicillin G for 4 weeks after surgery. He has recovered fully and resumed all of his normal activities, including downhill skiing, at 15 months follow-up.

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Cardiac magnetic resonance image using T2-weighted triple inversion recovery spin echocardiography in the HLA orientation. The image shows an abscess associated with the basal septum and prosthetic aortic valve ring.

## DISCUSSION

The evaluation of a patient with culture-negative endocarditis contains diagnostic challenges. In this case, it was critical to recognize an atypical organism capable of causing valvular destruction. Additionally, cardiac MRI best defined the full extent of the infection. *P acnes* are slow growing, microaerophilic gram-positive bacilli commonly found in the skin and sebaceous follicles and are of low virulence. Its isolation in cultures of blood and body fluids is usually considered to have no clinical significance because of its ubiquity as skin flora [Wilson 1972]. The organism may be missed in blood cultures if anaerobic cultures are not employed and cultures are not held up to 3 weeks. The time for detecting growth in blood ranges from 2 to 15 days [Gunthard 1994]. Most microbiology labs discard blood cultures after 7 days. Thus in cases where culture-negative endocarditis is suspected it is important for prolonged incubation.

When isolated in culture, *P acnes* should not be immediately dismissed as a contaminant. *P acnes* has been identified as an etiologic agent for a variety of serious infections including endocarditis, as demonstrated by this case [Horner 1992]. Reported cases of endocarditis are usually seen in patients with valvular abnormalities including prosthetic valves, pacemaker leads, and native rheumatic valves

[Lewis 1980]. The initial source of infection in our patient was likely the facial abscess or the dental procedure that preceded symptom onset. Penicillin is the treatment of choice.

Although *P acnes* endocarditis usually presents subacutely, abscess formation and extensive valvular destruction are common [Lewis 1980], often necessitating surgical treatment. As seen in our patient, aortic valve infection is often associated with aortic root abscesses, particularly in patients with prosthetic valves. TEE offers advantages in diagnosing complications of endocarditis involving the aortic root [Daniel 1991; Karalis 1992; Harris 2003], and MRI may offer improved visualization of an abscess, particularly when the ventricular septum is involved, as shown in this case. The ability to provide tissue characterization and to visualize a structure in any orientation allowed us to make the diagnosis. In the presence of paravalvular abscess, early surgery is advocated to achieve rapid control of infection, prevent further paravalvular destruction, and improve chances of survival [Karalis 1992].

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