

# *Propionibacterium acnes* Endocarditis of a Prosthetic Aortic Valve

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## ABSTRACT

In the few reported cases of *Propionibacterium* infective endocarditis involving prosthetic aortic valves, abscess is common and frequently requires surgery. We report a case of *P. acnes* infective endocarditis identified on prolonged blood cultures with aortic root abscess involving a Starr-Edwards valve. Intravenous antibiotics and valve replacement led to recovery.

### Introduction

*Propionibacterium acnes*, traditionally associated with *acnes vulgaris*, is generally considered of low virulence but has been linked to more serious infections. Over the last 25 y, *P. acnes* was reported as the causative organism in over 30 cases of infective endocarditis.<sup>1–4</sup> We report a case of proven *P. acnes* endocarditis of a prosthetic aortic valve complicated by aortic root abscess. We wish to highlight the need to culture anaerobically for prolonged time periods, have a high index of suspicion for abscess, perform transesophageal echocardiogram if transthoracic is negative, and plan for surgery early.

### Case Report

A 64-year-old man was admitted with 10 d of fever and 3 d of rigors with night sweats. A temporary molar filling was undertaken 6 wk preadmission, following 3 mo of dental pain. He received prophylactic amoxicillin cover due to his 20-year-old Starr-Edwards aortic valve. On admission he was febrile with a systolic murmur, splinter, and conjunctival hemorrhages. INR was 6.3, hemoglobin 12.6 g/dl, white cell count  $5.6 \times 10^9/L$ , C-reactive protein 82 mg/L. Urinalysis detected blood, ketones, and protein. Electrocardiogram (ECG) showed first-degree heart block. Blood cultures showed no growth at 48 h. Intravenous vancomycin and gentamicin were commenced. Transthoracic echocardiogram showed no evidence of endocarditis and a well-seated prosthetic valve. Dental radiology showed no caries or infection.

Anaerobic blood cultures grew gram positive bacilli after 7 d. Penicillin resistant *Propionibacterium acnes* were

identified in six anaerobic blood cultures. Ceftriaxone replaced vancomycin once sensitivities were ascertained. Transesophageal echocardiogram showed prosthetic valve vegetation, aortic root abscess, and paravalvular leak (Figure 1).

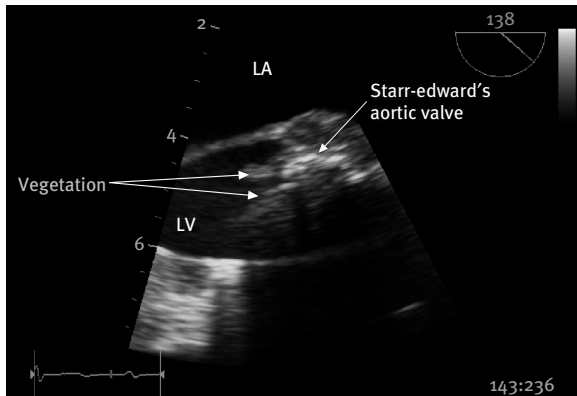
Surgery identified an abscess extending from the mid-point of the noncoronary cusp towards the left atrium with a 1 cm paraprosthetic leak and no fistula formation. Frank pus contained numerous gram positive bacilli but gave no culture. The Starr-Edwards valve was replaced with a 29 mm St. Jude valve. Discharge followed 28 postoperative days of intravenous ceftriaxone.

### Discussion

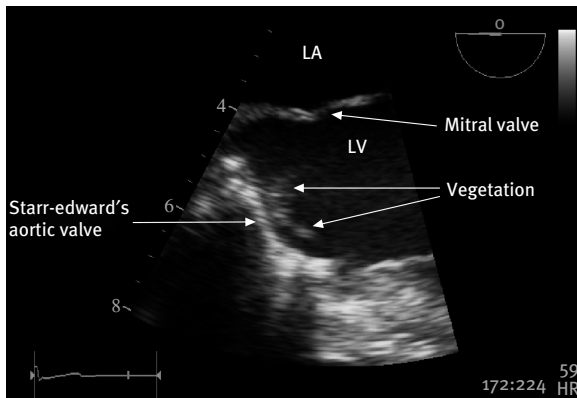
*P. acnes* has been linked to a small number of cases of infective endocarditis worldwide in addition to other serious infections.<sup>1–5</sup> *P. acnes* is often regarded as a skin contaminant when isolated in blood cultures.<sup>6,7</sup> As *propionibacterium* is present in sebaceous glands, ordinary skin cleaning before phlebotomy appears ineffective.<sup>8</sup>

Identifying the infective source of *P. acnes* endocarditis is difficult due to its widespread distribution and slow growing characteristics. Previous cases suggested potential sources that include acupuncture, injection, and skin injuries.<sup>9,10</sup> In this case we could not identify the source.

Cases often follow an insidious course as seen here.<sup>1,5</sup> Omission of early anaerobic blood culture has been shown to delay diagnosis.<sup>5</sup> In this case, early anaerobic blood cultures were crucial to identifying gram positive bacilli after 7 d with species and sensitivities after 9 d. This correlates with the 7 d median (range 5–14 d) for reported cases.<sup>1</sup> The C-reactive



**Figure 1.** Transesophageal echocardiogram (TEE) demonstrating left ventricle (LV), left atrium (LA), prosthetic aortic valve, and vegetation.



**Figure 2.** Transesophageal echocardiogram (TEE) deep transgastric view demonstrating prosthetic aortic valve vegetation, left ventricle (LV), left atrium (LA), and mitral valve.

protein (CRP) of 82 mg/L was similar to reported cases (mean 51, range 3–262).<sup>1</sup>

Transesophageal echocardiogram has been demonstrated to have greater sensitivity than the transthoracic approach in detecting both abscesses associated with endocarditis (87% versus 28%) and abnormalities associated with mechanical prosthetic heart valves (83% versus 22%).<sup>11,12</sup> This case, in addition to another similar report, supports the principle of performing early transesophageal echocardiogram after obtaining a negative transthoracic echocardiogram (Figure 2).<sup>5</sup>

In 13 reported cases of *Propionibacterium* endocarditis affecting prosthetic aortic valves, 10 involved abscess and required surgery, 3 of which died.<sup>1,2,4–6,13–16</sup> This case provides further evidence that these patients are at high risk of abscess formation and usually require surgery. Early consideration and planning for surgery is therefore crucial in a successful management strategy.

## Conclusion

*P. acnes* endocarditis of prosthetic aortic valves often follows a chronic insidious course with high risk of abscess formation. Anaerobic blood cultures should be taken early and may require incubation for up to 14 d. *P. acnes* should not be dismissed as a contaminant without careful consideration. A transesophageal echocardiogram should be considered early if transthoracic echocardiogram is negative. Poor penetrance of prosthetic valves means antibiotics alone are unlikely to be successful. The typically late presentation contributes to complications with prosthetic valves. Surgical valve replacement is almost always indicated and should be planned for early after commencing appropriate antimicrobial chemotherapy.

## References

1. Clayton JJ, Baig W, Reynolds GW, Sandoe JA. Endocarditis caused by propionibacterium species: a report of three cases and a review of clinical features and diagnostic difficulties. *J Med Microbiol.* 2006;55:981–987.
2. Hinestroza F, Djurkovic S, Bourbeau PP, Foltzer MA. Propionibacterium acnes as a cause of prosthetic valve aortic root abscess. *J Clin Microbiol.* 2007;45:259–261.
3. Van Leeuwen WJ, Kappetein AP, Bogers AJ. Acute dehiscence of a valve prosthesis 5 years after implantation. *Int J Cardiol.* 2007;117:e79–e81.
4. Harris KM, Ang E, Lesser JR, Sonnesyn SW. Cardiac magnetic resonance imaging for detection of an abscess associated with prosthetic valve endocarditis: a case report. *Heart Surg Forum.* 2007;10:E186–E187.
5. Kanjanathai S, Kanlun T. *Propionibacterium acnes*: a rare cause of late prosthetic valve endocarditis and aortic root abscess. *Int J Cardiol.* In press.
6. Pan SC, Wang JT, Hsueh PR, Chang SC. Endocarditis caused by propionibacterium acnes: an easily ignored pathogen. *J Infect.* 2005;51:e229–e231.
7. Esteban J, García-Calvo G, Jiménez-Castillo P, Soriano F. Failure of gram stain to detect propionibacterium acnes in specimens from clinically significant infections. *J Clin Microbiol.* 1996;34:2051.
8. Lewis JF, Abramson JH. Endocarditis due to propionibacterium acnes. *Am J Clin Pathol.* 1980;74:690–696.
9. Armstrong RW, Wuerfleiner RD. Endocarditis due to propionibacterium granulosum. *Clin Infect Dis.* 1996;23:1178–1179.
10. Scheel O, Sundsfjord A, Lunde P, Andersen BM. Endocarditis after acupuncture and injection—treatment by a natural healer. *JAMA.* 1992;267:56.
11. Daniel WG, Mügge A, Martin RP, Lindert O, Hausmann D, et al. Improvement in the diagnosis of abscesses associated with endocarditis by transesophageal echocardiography. *N Engl J Med.* 1991;324(12):795–800.
12. Daniel WG, Mügge A, Grote J, et al. Comparison of transthoracic and transesophageal echocardiography for detection of abnormalities of prosthetic and bioprosthetic valves in the mitral and aortic positions. *Am J Cardiol.* 1993;71:210–215.
13. Horner SM, Sturridge MF, Swanton RH. Propionibacterium acnes causing an aortic root abscess. *Br Heart J.* 1992;68:218–220.
14. Durupt S, Boibieux A, Ballet-Mechain M, et al. [Propionibacterium acnes infectious endocarditis]. *Presse Med.* 1998;27:1839–1841.
15. Clarke NR, Banning AP. Images in cardiology: mycotic aneurysm formation with dehiscence of a valved aortic conduit resulting in dynamic aortic obstruction. *Heart.* 2000;84:271.
16. Huynh TT, Walling AD, Miller MA, et al. Propionibacterium acnes endocarditis. *Can J Cardiol.* 1995;11:785–787.