Prevotella oralis Homograft-Valve Endocarditis Complicated by Aortic-Root Abscess, Intracardiac Fistula, and Complete Heart Block

Endocarditis due to *Prevotella* species is rare. We describe *Prevotella oralis* (formerly *Bacteroides oralis*) homograft aortic valve monomicrobial endocarditis, complicated by an aortic root abscess and an intracardiac fistula. To our knowledge, only one case of *P. oralis* monomicrobial endocarditis has been reported previously [1].

A 44-year-old man underwent an elective aortic valve replacement with a 22-mm cryopreserved aortic homograft because of severe aortic insufficiency. Nineteen days later he was readmitted to the hospital because of a 3-day history of fever (temperature, 38°C). His blood pressure was 110/60 mm Hg and his pulse was 100 beats/min; a grade 2–3/6 systolic murmur was noted over the left sternal border. Laboratory findings included the following values: hemoglobin, 10.3 g/dL; hematocrit, 32%; WBC count, 13,070/mm^3 (82% segmented forms and 12% band forms); and platelet count, 89,000/mm^3. Electrocardiography demonstrated a complete atrioventricular (A-V) block with a nodal escape rate of 100 beats/m. Transesophageal echocardiography (TEE) showed an aortic root abscess and an intracardiac fistula originating from the left ventricular outflow tract and extending into the right atrium through the membranous septum. Possible vegetations in the right atrium near the fistula were also revealed (figure 1). Treatment was initiated with vancomycin (1 g iv b.i.d.), gentamicin (100 mg iv t.i.d.), and rifampin (300 mg iv b.i.d.).

Four sets of blood cultures were positive in 48 hours for a gram-negative rod that grew only on CDC (Centers for Disease Control and Prevention) anaerobe agar and brucella agar plates under anaerobic conditions. The microorganism was identified as *P. oralis* according to biochemical testing, metabolic end-products analysis, and cell-wall fatty acid profiling by use of gas liquid chromatography [2]. The isolate was β-lactamase positive. MICs determined by use of a microdilution method were as follows: penicillin, >8 μg/mL; amoxicillin/clavulanic acid, 4 μg/mL; cefoxitin, 2 μg/mL; piperacillin/tazobactam, ≤ 16 μg/mL; imipenem, ≤ 0.06 μg/mL; clindamycin, ≥ 64 μg/mL; and metronidazole, 0.25 μg/mL. The therapy regimen was then changed to that with imipenem (500 mg iv q.i.d.).

A repeated aortic valve replacement was undertaken; the homograft and infected tissue from the aortic root abscess were removed, and a new cryopreserved homograft was implanted. The intracardiac fistula was closed. Histopathologic examination of the valvular tissue revealed an inflammatory infiltration, and intraoperative collection of pus and biopsy specimens was arranged. Gram staining of the aortic homograft revealed gram-negative rods, but after long incubation in appropriate media and anaerobic atmosphere cultures of the specimen were negative. Postoperative treatment with metronidazole (500 mg t.i.d.) was continued for 6 weeks. No portal of entry of *P. oralis* could be detected retrospectively. At 3 months follow-up the patient was doing well; blood cultures were negative.

Anaerobic microorganisms are rare in infectious endocarditis (2% of all cases) [3]. The microorganisms more frequently observed are *Bacteroides fragilis, Fusobacterium necrophorum, Clostridium* species, *Fusobacterium nucleatum, Propionibacterium acnes,* and others [3]. *Prevotella,* a new gram-negative obligately anaerobic genus, previously classified as *Bacteroides* [4], recovered primarily from abscesses and in obstetric and gynecologic infections, has also been implicated in osteomyelitis and soft-tissue infections. The anaerobic bacteria usually cause valve destruction, congestive heart failure, and systemic emboli. The high mortality rate among previously reported cases of anaerobic endocarditis has ranged from 21% to 46%, but more recently the rate seems to have diminished [5]. It is extremely rare that endocarditis due to anaerobic bacteria affects prosthetic valves. This is particularly true with the use of a cryopreserved homograft, because of its intrinsic resistance to infections.

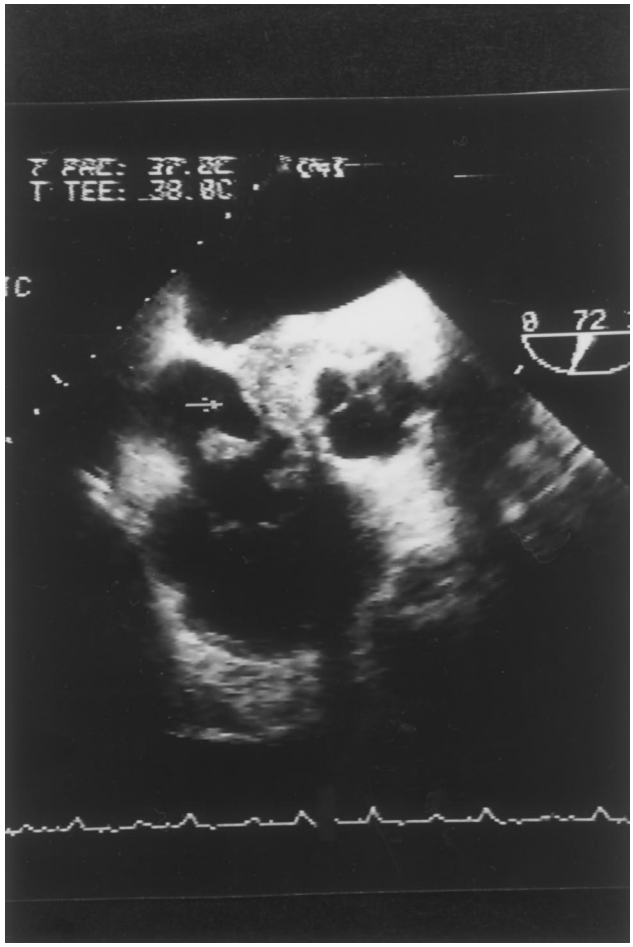

Figure 1. Transesophageal echocardiography (short-axis view) of the aortic valve showing the aortic root abscess in a patient with homograft valve endocarditis due to *Prevotella oralis.* Infection of the prosthesis ring extended to the adjacent annular connective tissue resulting in an aortic root abscess (*arrow*) on the noncoronary sinus. In addition, there are two large pedunculated masses from the aortic wall inside the right atrium.

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The growing resistance of *Bacteroides* species (among them *B. oralis*) that were previously susceptible to penicillins has been noted [3]. Intravenous and oral metronidazole therapy appears to be safe and effective in the treatment of severe infections due to anaerobic bacteria [6]. Other bactericidal antimicrobial agents such as piperacillin/tazobactam, cefoxitin, or imipenem/cilastatin should be adequate for therapy.

In summary, a monomicrobial bacterial endocarditis due to *P. oralis* has been reported. The early infection (within 2 months) of the homograft aortic valve, the absence of septic emboli, and the development of third-degree heart block are the noteworthy features of this case.

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References

1. Felner LM, Dowell VR Jr. Anaerobic bacterial endocarditis. N Engl J Med **1970**;283:1188–92.
2. Jousimies-Somer HR, Summanen PH, Finegold SD. *Bacteroides, Porphyromonas, Prevotella, Fusobacterium,* and other anaerobic gram-negative bacteria. In: Murray PR, Baron EJ, Pfaller MA, Tenover FC, Yolken RH. Manual of clinical microbiology. 6th ed. Washington DC: ASM Press, **1995**:603–20.
3. Scheld WM, Sande MA. Endocarditis and intravascular infections. In: Mandell GL, Bennett JE, Dolin R, eds. Mandell, Douglas and Bennett's principles and practice of infectious diseases. 4th ed. New York: Churchill Livingstone, **1995**:740–65.
4. Shan HN, Collins DM. *Prevotella,* a new genus to include *Bacteroides melaningogenicus* and related species formerly classified in the genus *Bacteroides.* Int J Syst Bacteriol **1990**;40:205–8.
5. Nastro LJ, Finegold SM. Endocarditis due to anaerobic gram-negative bacilli. Am J Med **1973**;54:482–96.
6. Galgiani JN, Busch DF, Brass C, et al. *Bacteroides fragilis* endocarditis, bacteremia and other infections treated with oral or intravenous metronidazole. Am J Med **1978**;65:284–9.

Severe Acute Respiratory Failure Due to Legionella Pneumonia Treated with Extracorporeal Membrane Oxygenation

Legionella pneumophila infection is an important cause of severe community-acquired pneumonia (CAP). Overall mortality rates range from 5.4% to 20% [1, 2]. Many of these deaths are due to multiple organ dysfunction syndrome (MODS) following fulminant severe acute respiratory failure (SARF). Extracorporeal membrane oxygenation (ECMO) is a modified form of cardiopulmonary bypass that supports gas exchange while the lungs recover from acute injury. ECMO is potentially a significant advance in the therapy for patients with SARF, including legionella pneumonia [3]. From 1989 until March 1998, 140 adult patients with SARF that was unresponsive to maximal conventional intensive therapy received ECMO therapy in our institute with an overall survival rate of 64%. This report summarizes our experience with ECMO therapy for patients with SARF due to legionella pneumonia.

Information about the 13 patients, 8 confirmed and 5 presumptive cases of legionella pneumonia, were obtained from medical records. Confirmed cases were defined as cases with legionella isolated from pulmonary secretions and/or a positive urinary antigen assay. Presumptive cases were defined as cases with acute-phase single-serum indirect fluorescent antibody titers (SFAT) of >256. Survival was defined as survival to hospital discharge.

Our adult ECMO protocol has been published elsewhere [3]. Veno-venous ECMO is used to support pulmonary function allowing ''lung rest.'' Patients are weaned from ECMO after recovery of pulmonary function. There were seven (one female) survivors and six (one female) nonsurvivors, with a survival rate of 53.8% (table 1). This rate decreased to 25% in the subgroup of patients with confirmed legionella infection. All patients required an FiO_2 of $>80\%$ pre-ECMO, indicating an expected mortality rate of $>80\%$ with conventional treatment [4]. Mechanical complications related to the ECMO circuit were minimal in all patients. Patient 9 had an epistaxis associated with nasogastric tube insertion, which was difficult to control because of systemic heparinization. All three patients with SARF alone, and four of five patients with two failed organs survived. However, all five patients with three or four failed organs died. This is consistent with studies of SARF from all causes, with survival rates of $<10\%$ in SARF with multiorgan failure, compared with 45% in SARF alone [4, 5]. Patient 11's condition deteriorated rapidly after 2 days of ventilation at the referring hospital. He died 1 hour after the initiation of ECMO support of intractable circulatory failure associated with sepsis. Patient 13 had been treated with methotrexate for undifferentiated mixed connective tissue disease before developing SARF. She completed ECMO therapy successfully, but developed severe leukopenia due to bone marrow suppression and fatal septicemia.

The case-fatality rate of legionella is affected by patients' underlying diseases; a high mortality rate has been reported among immunocompromised patients [6]. Macrolides as the main antibacterial agents were used in all patients; rifampin was used in 11 patients and ciprofloxacin in 6 [1, 2].

Our experience with a 25% survival rate in patients with SARF due to confirmed legionella pneumonia, despite early intervention, compares relatively poorly with our overall survival rate of 64%. Optimal therapy for SARF remains uncertain. New treatment methods to overcome MODS, such as extracorporeal liver support system [7] or ECMO combined with partial liquid ventilation, may be useful [8].

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