A Man with a Prosthetic Aortic Valve and Subacute Calf Pain
(See page 608 for Photo Quiz)

Diagnosis: *Cardiobacterium hominis* prosthetic valve endocarditis.

*C. hominis* is one of the fastidious gram-negative bacteria that belong to the HACEK group of organisms (*Haemophilus parainfluenzae*, *Haemophilus aphrophilus*, *Haemophilus paraphrophilus*, *Actinobacillus actinomycetemcomitans*, *C. hominis*, *Eikenella corrodens*, and *Kingella kingae*). Tucker et al. [1] first reported it as a cause of endocarditis in 1962. The HACEK group are part of the normal oropharyngeal flora. Poor dentition and/or having undergone dental work within the past 6 months have been described as sources of infection [2]. HACEK organisms cause ~3% of cases of infective endocarditis [3]. One study found that it takes, on average, 3.4 days (range, 1–10 days) to grow these organisms with automated blood culture systems [3].

On Gram stain, *C. hominis* appears as teardrop- and dumbbell-shaped gram-negative rods. Figure 1 demonstrates the filamentous form of this organism. Classically, one can see a rosette shape on the Gram stain. The other gram-negative HACEK organisms have their own characteristics on Gram stain. Both *A. actinomycetemcomitans* and *Haemophilus* species are small coccobacillary rods, but, with the latter, one can occasionally see filamentous forms. *E. corrodens* typically appears as slender straight rods with round ends. *K. kingae* appears as short straight rods with square ends that form pairs and chains [4]. Biochemical testing of *C. hominis* usually reveals it to be oxidase positive, indole positive, and catalase negative; *E. corrodens* and *K. kingae* are oxidase positive, whereas *Haemophilus* species and *A. actinomycetemcomitans* are oxidase negative. *A. actinomycetemcomitans* is the only catalase-positive organism in the HACEK group [4].

Figure 1. Gram stain of the isolate from a blood culture (original magnification, 1000x) showing gram-negative rods with both filamentous (arrow) and dumbbell-shaped (arrowheads) morphologies characteristic of *Cardiobacterium hominis*.
The patient underwent bioprosthetic aortic valve replacement and completed a 6-week course of intravenous ceftriaxone. He remains healthy after 1 year of follow-up.

Acknowledgment

We would like to thank Dr. Andrej Trampuz for his thoughtful review of this manuscript.

Rajesh M. Prabhu,1 Abhiram Prasad,2 and Rodney L. Thompson1
Divisions of 1Infectious Diseases and 2Cardiovascular Diseases, Mayo Clinic, Rochester, Minnesota

References