Nonsurgical Management of Mitral Valve Endocarditis Due to Cardiobacterium valvarum in a Patient with a Ventricular Septal Defect

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Cardiobacterium valvarum is a relatively novel agent of infective endocarditis. We describe the first case of infective endocarditis due to this pathogen in the Asian Pacific. This case is unique in its involvement of the mitral valve as well as its clinical resolution exclusively resulting from treatment with antibiotics without resorting to valve replacement/explantation.

CASE REPORT

A 63-year-old Chinese female with a congenital perimembranous ventricular septal defect (VSD) presented with a complaint of 5 days of frontal headache, slurred speech, and vomiting. The patient was afebrile (37.1°C) and nonhypotensive (135-110/70-mm Hg) on admission. The leukocyte count was 10.4 × 10^9/liter, the hemoglobin level was 10.5 g/dl, and the C-reactive protein (CRP) level was 79.8 mg/liter. Systemic examination was unremarkable except for poor dentition (dental caries) and a grade 5 pansystolic murmur secondary to severe mitral valve regurgitation. A computed tomography (CT) scan of the brain demonstrated a frontotemporal subarachnoid hemorrhage. A subsequent 4-vessel cerebral angiogram revealed a bilobed aneurysm from the parietal cortical branches of the left middle cerebral artery. An initial transthoracic echocardiogram demonstrated a flail, prolapsed posterior mitral valve leaflet, multiple vegetations on the anterior and posterior mitral leaflets, and 0.5 cm of vegetation on the perimembranous VSD. Treatment of the patient was initiated with an empirical regimen of intravenous (i.v.) penicillin G (4 million U every 4 h), i.v. cloxacillin (2 g every 4 h), and i.v. gentamicin (150 mg once a day [OD]) for suspected native valve endocarditis with embolic complications pending microbiological identification.

All three aerobic blood cultures (Bactec Plus Aerobic/F Bottles) (BD Diagnostic Systems, Sparks, MD) collected on admission revealed a lollipop-shaped Gram-negative rod on the 4th day of incubation, thereby satisfying the modified Duke’s criteria (1) for definite endocarditis with a HACEK (Haemophilus species [Haemophilus parainfluenzae, Haemophilus aphrophilus, Haemophilus paraphrophilus], Actinobacillus actinomycetemcomitans, Cardiobacterium hominis, Eikenella corrodens, and Kingella species) organism. Consequently, the antibiotics described above were discontinued and i.v. ceftriaxone (2 g OD) treatment was initiated. Subcultures from the broth were grown using blood agar, chocolate agar, and MacConkey agar (BBL; Bio-Media) which were incubated aerobically at 37°C with 5% CO2. Visible colonies were observed on day 3 of incubation, with the cultures growing better on chocolate than on blood agar plates. Colonies were 0.5 mm in size, round, and weakly alphahemolytic. Preliminary biochemical reactions performed included catalase (negative result), oxidase (positive), and spot indole (positive) reactions. A matrix-assisted laser desorption ionization–time-of-flight mass spectrometry (MALDI-TOF MS; Bruker Daltonik GmbH) Sepsityper analysis performed directly from the blood broth yielded an unreliable identification, while the one performed from the growth on the plates gave an acceptable identification for Cardiobacterium valvarum, with a score of 1.787. This correlated with the identification from sequencing of the 16S rRNA gene performed on the blood broth bottle. Using published primers, an amplicon of 800 bp was generated (2). Nucleotide sequencing of both strands of the PCR amplicon was performed using an ABI 3730XL DNA sequencer (Perkin-Elmer, Applied Biosystems Division, Foster City, CA). The sequenced product was 99.7% identical to the 16S rRNA C. valvarum GenBank entry (accession no. DQ643464) in a region of 759 determined base pair positions. Antibiotic susceptibility testing other than a cefinase test (negative result) was not attempted in view of the organism’s slow and fastidious growth.

Repeat blood cultures collected 27 days postadmission were sterile. The patient was continued on i.v. ceftriaxone at 2 gm OD for 6 weeks in the Outpatient Parenteral Antibiotic Therapy (OPAT) clinic without incident. The patient remained stable without any clinical signs of heart failure or neurological sequelae. The clinical improvement was accompanied by a resolution of the inflammatory markers, including leukocyte count (7.6 × 10^9/liter) and CRP level (3.2 mg/liter). A repeat CT angiogram revealed a resolution of the subarachnoid hemorrhage with a stable aneurysm.

The Cardiobacterium genus is implicated in a variety of infections, including infective endocarditis (IE), with C. hominis being much more commonly isolated than C. valvarum (3, 4). It may be argued that, unlike C. hominis, C. valvarum is not a putative producer of beta-lactamases (5) and thus that i.v. penicillin G treatment might have sufficed, but due to the paucity of clinical evidence in light of the limited number of case reports, the therapy described above was not deescalated. To our knowledge, this is the first case of IE due to C. valvarum in the Asian Pacific region and also the first in published literature to result in a favorable clinical outcome without any surgical intervention (6). In contrast to similar reports in recent literature

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(5, 7, 8) of afflictions typically seen in patients with congenitally bi-cuspid aortic valves, this case demonstrates the additional vulnerability of the mitral valve in a background of preexisting VSD. This case also illustrates the role of modern nonbiochemical methods, namely, MALDI-TOF, in the expedited identification of fastidious and uncommon pathogens which usually require molecular maneuvers such as bacterial 16S rRNA sequencing, with the attendant labor and costs involved, which is especially crucial in laboratories with limited access to a molecular facility on site.

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