Non-surgical management of mitral valve endocarditis due to *Cardiobacterium valvarum*

in a patient with Ventricular septal defect

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Abstract

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

Case Report

A 63 year old Chinese female with 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 non hypotensive (135/70 mmHg) on admission. The leukocyte count was 10.4 × 10^9/l, the hemoglobin level was 10.5g/dl, and the CRP was 79.8 mg/l. Systemic examination was unremarkable except for poor dentition (dental caries) and a grade 5 pansystolic murmur secondary to severe mitral valve regurgitation. A CT scan of the brain demonstrated a fronto-temporal 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 trans-thoracic echocardiogram (TTE) demonstrated a flail, prolapsed posterior mitral valve leaflet, multiple vegetations on the anterior and posterior mitral leaflets, and 0.5 cm vegetation on the perimembranous VSD. The patient was initiated on an empirical regimen of intravenous (i.v.) Penicillin G 4 million units 4hrly, i.v. Cloxacillin 2 gm 4 hrly and i.v. Gentamicin 150 mg 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 organism. Consequently, the above antibiotics were discontinued and i.v. Ceftriaxone 2 gm OD was initiated. Subcultures from the broth were performed onto 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 the 3rd day of incubation with growth better on chocolate than on blood agar plates. Colonies were 0.5 mm in size, round and weakly alpha hemolytic. Preliminary biochemical reactions performed included a catalase (negative), oxidase (positive), and spot indole (positive). A matrix-assisted laser desorption/ionization time-of flight (MALDI-TOF MS; Brüker 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 (DQ645464) in a region of 759 determined base pair positions. Antibiotic susceptibility testing other than a cefinase (negative) was not attempted in view of the organism’s slow and fastidious growth.

Repeat blood cultures collected 27 days post admission were sterile. She was continued on i.v. ceftriaxone 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 leucocyte count ($7.6 \times 10^9/l$) and CRP (3.2 mg/l). 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 *C. valvarum* isn’t a putative producer of beta-lactamases unlike *C. hominis* (5) and thus i.v. Penicillin G may have sufficed, but due to the paucity of clinical evidence in light of the limited number of case reports, the above therapy was not de-escalated. To our knowledge, this is the first case of IE due to *C. valvarum* in the Asia-Pacific region and also the first in published literature to experience a favourable clinical outcome without any surgical intervention (6). In contrast to similar reports in recent literature (5, 7-8) of afflictions typically in patients with congenitally bicuspid aortic valves, this case demonstrates the additional vulnerability of the mitral valve on a background of pre-existing VSD. This case also illustrates the role of modern non-biochemical methods, namely the MALDI-TOF in the expedited identification of fastidious and uncommon pathogens which usually require molecular maneuvers like bacterial 16S rRNA sequencing with the attendant labour and costs involved, especially crucial in laboratories with limited access to a molecular facility on site.

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