Mitral and aortic valve endocarditis caused by a rare pathogen: *Streptococcus constellatus*

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Abstract

*Streptococcus constellatus* endocarditis is associated with systemic embolism and frequently with a poor prognosis. We describe the first case reported in the literature of infective endocarditis by penicillin-resistant *S. constellatus* causing both mitral and aortic valve regurgitation, treated successfully with double-valve replacement.

**Keywords:** Infective endocarditis • *S. constellatus* • Heart valve • Bioprosthesis

INTRODUCTION

The *Streptococcus milleri* group (SMG) consists of three species: *Streptococcus anginosus*, *Streptococcus intermedius* and *Streptococcus constellatus* [1]. The SMG strains constitute part of the normal flora of the human oral cavity, upper respiratory and gastrointestinal tracts [2]. This group is often involved in suppurative infection, especially cirrhosis, diabetes, malignancy and immunodeficiency disease [3]. SMG strains isolated from abscesses adhere in greater numbers to buccal epithelial cells and strains isolated from infections in the body, including abscesses, are able to bind more fibronectin than other strains [4]. Furthermore, strains can produce enzymes that may hydrolyze connective tissue components [2]. Data have demonstrated that strains possessing Lancefield group C polysaccharides are able to bind large amounts of albumin, and this may be related to their ability to aggregate human platelets [5]. They are also the causes of infective endocarditis with *S. anginosus* predominance [5].

We report a rare case of infective endocarditis by penicillin-resistant *S. constellatus*.

CASE REPORT

A 79-year-old man who developed endocarditis caused by *S. constellatus*, a member of the SMG, was referred to our hospital for surgical correction of mitral and aortic valve regurgitation. The patient was transferred to our observation from the department of infective disease where he stayed for 32 days. Two blood cultures for aerobic and anaerobic pathogens were immediately taken and empiric antibiotic therapy with penicillin G–gentamicin combination was initiated. Blood cultures were evaluated with The BacT/ALERT and the BACTEC 9240 systems, which isolated viridans streptococci. Despite intensive antibiotic therapy, the patient’s general condition did not improve and therefore, another set of blood cultures was obtained. The isolates grew well and had pinpoint colonies of alpha-haemolysis on 5% defibrinated sheep blood agar (Salubris, Turkey) in 5% CO2 and ambient air at 37°C. They were catalase-negative and gram-positive cocci. The isolate was identified as *S. constellatus* by both the API Rapid ID32 Strep system (BioMerieux, France) and the REMEL Rapid STR system (Apopgent-USA). The isolate was susceptible to ceftriaxone, chloramphenicol, erythromycin, ofloxacin, cefotaxime, tetracycline, levofloxacin and vancomycin, but resistant to penicillin G. We immediately changed the antibiotic treatment to 2 × 4 g cefotaxime intravenously per day. Splenic infarction was documented with abdominal echocardiography. However, the persistence of vegetations on the control transthoracic echocardiogram led us to transfer the patient to our cardiac surgery department. On admission, the patient’s height was 168 cm and his weight was 64 kg. Auscultation revealed a diastolic grade 4/6 murmur at the left sternal border, an Austin Flint murmur and a diastolic grade 4/6 murmur at the left fifth intercostal space. The electrocardiogram was unremarkable. Transthoracic echocardiography showed a morphologically tricuspid aortic valve with evidence of severe regurgitation and multiple vegetations on the aortic cusps were seen. The aortic root was normal. The mitral valve showed large vegetation on the anterior leaflet with severe regurgitation. Tricuspid valve anomalies were absent. Results of serum chemistry analysis, coagulation studies and haematologic counts were normal.

A standard median sternotomy was performed. At the inspection, the aortic wall was normal, and the valve presented multiple floating vegetations with a small perforation on the right cusp (Fig. 1). The mitral valve presented a chordal rupture that produced the prolapse of the P2 scallop. The mitral anterior leaflet was thickened and fibrotic (Fig. 2). Both valves were replaced. The native mitral valve was replaced with a 29-mm Medtronic Mosaic (Medtronic, Inc., Minneapolis, MN, USA) porcine bioprosthesis with interrupted 2-0 Ethibond pledgeted...
Infective endocarditis by *S. constellatus* is extremely rare. *Streptococcus constellatus* is the only species capable of producing thrombin-like activity, and the Lancefield group C strains are the only strains capable of aggregating platelets [6]. The bacterial–platelet–fibrin aggregates become so large that they restrict the normal functioning of the heart valve. Bacterial products may also contribute to heart valve destruction. The production of abscesses may follow a similar course, with bacterial adherence to epithelial or endothelial cells in the first step, then the deposition of platelets and fibrin [7]. Ejima et al. [8] described prosthetic valve endocarditis caused by *S. constellatus* infection complicated by multiple organ failure and systemic embolism. They considered that surgical treatment was difficult, continued antibiotic therapy, and at follow up the patient developed paravalvular abscesses around the aortic valve. Our case is the first reported in the literature with infective endocarditis caused by penicillin-resistant *S. constellatus* leading to both mitral and aortic valve destruction. Initially, the patient was treated with a penicillin G–gentamycin combination. After antibiogram results, we immediately changed the antibiotic treatment to cefotaxime. Finally, because the cefotaxime therapy was unsatisfactory, in the presence of persistent vegetations, we opted for a surgical treatment.

The postoperative course was uneventful. The patient was transferred to infectiology department on the 6th postoperative day and he continued cefotaxime therapy for another 6 weeks after intervention.

At discharge, the echocardiogram showed a normal aortic and mitral bioprosthesis function without paravalvular leakage.

At the 6-month follow-up, the patient was healthy without any recurrence of infection.

**CONCLUSIONS**

As in our case, infective endocarditis by *S. constellatus* causing mitral and aortic valve regurgitation may have a good prognosis if treated with early valve surgery and cefotaxime therapy; such treatment may be a more appropriate therapeutic approach for penicillin-resistant strains.

**Conflict of interest:** none declared.

**REFERENCES**


