Prosthetic Ball Valve Endocarditis due to *Gemella* Species

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A case is presented of endocarditis that was affecting a prosthetic ball valve (Starr–Edwards) and which was caused by *Gemella* species. A 57-year-old man was admitted with a 3-day history of abdominal pain with fever. At the time of admission, his temperature was 37.7°C and laboratory tests showed elevated inflammatory parameters and an increased neutrophil count. However, transthoracic echocardiogram showed no vegetation. During hospitalization, *Gemella* spp. were detected by blood culture, and a transesophageal echocardiogram showed vegetation on the prosthetic valve. He was treated with intravenous ampicillin and astromycin, and also underwent valve replacement. This is the first case in Japan of infective endocarditis of a prosthetic valve due to *Gemella* spp. (Jpn Circ J 1998; 62: 626–628)

Key Words: Endocarditis; *Gemella* species; Prosthetic valve; Transesophageal echocardiogram

The *Gemella* species belong to the Streptococcae, and are commensal organisms of the upper respiratory tract. There are 2 species: *Gemella hemolysans* and *Gemella morbillorum*. These organisms have rarely been identified as a cause of infection and appear to be opportunistic pathogens, but since 1982 there have been a few reports of an association with infectious endocarditis.1–6 There have only been 2 cases in Japan of infective endocarditis due to *Gemella* spp.1–2 and no cases of prosthetic valve endocarditis due to these organisms have been reported in Japan.

Case Report

A 57-year-old man was admitted to hospital with a 3-day history of worsening abdominal pain and oliguria. He had undergone aortic valve replacement with a Starr–Edwards ball valve in 1973, and then had been followed up at the outpatient department under treatment with digoxin, diuretics and anticoagulant agents. 3 days prior to admission he developed left-sided abdominal pain, which was followed with fever and oliguria. At the time of admission, he still complained of severe abdominal pain and oliguria, suggestive of renal arterial embolism. His temperature was 37.7°C, his pulse was regular (72 beats/min), and his blood pressure was 100/50 mmHg. Mechanical S2, S4 and a grade 3/6 systolic murmur were audible at the left sternal border. The lungs were clear on auscultation. The liver and spleen were not palpable, but there was moderate tenderness over the left costovertebral angle. Chest roentgenograms showed no pulmonary congestion. Laboratory studies disclosed the following data: leukocyte count, 15730 cells/mm³ (80% neutrophils); hemoglobin, 12.2 g/dl; hematocrit, 40.2%; C-reactive protein, 1.8 mg/dl; serum creatinine level 1.3 mg/dl; blood urea nitrogen 32 mg/dl.

Urinalysis did not reveal hematuria or proteinuria. After admission, the low grade fever subsided spontaneously in 4 days. Transthoracic echocardiogram showed no vegetation on the prosthetic valve. Abdominal echocardiogram and computed tomography (CT) also showed no abnormalities. However, the elevated inflammatory parameters persisted. 3 blood samples were collected for culture, and *Gemella* spp. were detected in only 1 sample with the Rapid ID 32 Strep identification system (BioMerieux S.A., France). The patient became febrile again on hospital day 20. Six blood samples were collected for culture in order to rule out contamination, and *Gemella* spp. were detected in all samples. Transesophageal echocardiogram first showed vegetations on the prosthetic valve (Fig 1). The organism was highly sensitive (+) to ampicillin, cefazolin, cefotiam, clindamycin, minocycline, aminoglycosides and erythromycin, and sensitive (+) for benzylpenicillin. He was treated with intravenous ampicillin (6 g/day) and astromycin (600 mg/day). On hospital day 35, he developed dysartria, which improved after a few hours and brain CT showed a small low-density area in the cerebrum. The inflammatory parameters and increased neutrophil count persisted and a transthoracic echocardiogram showed that the vegetation was larger than on the transesophageal echocardiogram (Fig 2). Uncontrolled sepsis and systemic embolism indicated surgical treatment. On day 40, he underwent valve replacement with a Carbomedix 27 bileaflet valve. Vegetation and destruction of the cage of the ball valve were observed (Fig 3). The postoperative clinical course was excellent and the patient is stable (NYHA II).

Discussion

*Gemella* spp. are commensals of the upper respiratory tract; there are 2 species: *Gemella hemolysans* and *Gemella morbillorum*. These organisms have rarely been identified as a cause of infection, but several reports since 1982 have indicated that it can be associated with infectious endocarditis.1–5 In our patient, *Gemella* spp. were detected in 7 blood culture samples out of 9, using a Rapid ID 32 Strep identification system. This organism is Gram positive, anaerobic, catalase negative and oxidase negative, and produces mainly L(++)-lactic acid but no gas from glucose.

However, the identification system could not differentiate the 2 species and further examination, including analysis of DNA, would be needed. Whitney et al reported that DNA–DNA hybridization analysis indicated that the 2 Gemella spp. are related at the genus level but are not a single species. Buu et al recommended penicillin G combined with an aminoglycoside for the treatment of subacute endocarditis caused by Gemella hemolyzans. Our patient was treated with intravenous ampicillin and astromycin, to which the Gemella spp. showed a high sensitivity (3+), but he developed cerebral embolism and the vegetation became larger. Prosthetic valve endocarditis is still a very serious condition, with a high mortality rate. Prosthetic mechanical valve endocarditis proba-

Fig 1. (a), (b) Transesophageal echocardiography showing dilatation of the aorta and left atrium, and vegetation (arrow) on the aortic prosthetic valve.

Fig 2. Transthoracic echocardiography showing dilatation of the left ventricle and vegetation (arrow) on the aortic prosthetic valve.

Fig 3. The cage of the Starr–Edwards ball valve extracted from the patient has been destroyed, and bacterial vegetation is growing on it.
ably differs from native valve endocarditis in that it is often associated with an infection of the attachment site; extension of infection of the attachment site to the prosthetic valve is common. Ben et al reported that patients who had prosthetic valve endocarditis with congestive heart failure, persistent sepsis and repeat arterial embolism had a poor prognosis and should be treated by early surgical intervention. In the present case, uncontrolled sepsis and arterial embolism were documented and surgery was recommended.

Transthoracic echocardiogram is useful for the detection of vegetation and evaluation of prosthetic valve function, but it is very limited in the demonstration of infective lesions because of acoustic shadowing. Transesophageal echocardiogram is better for visualizing the left ventricular outflow tract, where vegetation of a prosthetic aortic valve may be present, and is considered to be more accurate than transthoracic echocardiogram in detecting valvular vegetation. In our patient, a transthoracic echocardiogram could not demonstrate vegetation, but a transesophageal echocardiogram done 1 week later revealed vegetation. Thus, transesophageal echocardiogram should be performed for the diagnosis and follow-up of prosthetic valve endocarditis.

In conclusion, we have reported a very rare case in Japan of a 57-year-old man with aortic prosthetic ball valve (Starr–Edwards) endocarditis due to *Gemella* spp. The outcome was successful after combined medical and surgical treatment.

References