

## CLINICAL VIGNETTE

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# Infective Endocarditis caused by *Gemella bergeri*

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### Introduction

*Gemella* is a genus of gram-positive cocci in pairs and composes the normal flora of oral, digestive, and urinary tracts. Though it may rarely cause systemic illness, it has been associated with serious infections, including meningitis and septic shock.<sup>1</sup> However, its connection with infective endocarditis (IE) remains extremely rare. *Gemella* is a very slow growing organism and typically difficult to grow and isolate, so it presents a challenge for clinicians to diagnose, identify, and treat in a timely manner. We present a 61-year-old male who presented with infective endocarditis involving the mitral valve caused by *Gemella bergeri*.

### Case Report

A 61-year-old male with hypertension, dyslipidemia, and type 2 diabetes who presented to the emergency department with 1 week of low-grade fevers, chills, and diarrhea. At presentation, he had a temperature of 99.8F, heart rate 128, blood pressure 127/85, and SpO<sub>2</sub> 97% on room air. Physical exam was unremarkable. Initial laboratory testing revealed a WBC 12.4 with a neutrophilic predominance, otherwise normal chemistries and lactic acid. Troponin T was elevated at 0.063. He was admitted to the hospital and initial blood cultures revealed 1 of 4 bottles positive for gram variable cocco-bacilli, which was thought to be a contaminant. Chest x-ray was unremarkable. Transthoracic echocardiogram revealed grade I diastolic dysfunction with hyperdynamic LVEF of >70% with trace mitral regurgitation and trace tricuspid regurgitation. No vegetations were noted. The patient was treated empirically with IV levofloxacin and clinically improved and was discharged on oral levofloxacin.

Soon after discharge, he developed recurrent fevers, chills, and diarrhea and returned to the emergency department. His temperature was 99.5F, heart rate was 121. Bloodwork again revealed leukocytosis with WBC 14.3. Lactate was normal. Troponin T was 0.025. Review of microbiology data from prior admission that had stated gram variable cocco-bacilli now speciated *Gemella bergeri* and Infectious disease consultation was obtained. The patient was admitted and started on parenteral vancomycin and daptomycin. Repeat blood cultures isolated *Gemella bergeri* in 4 of 4 bottles. Subsequent CT of the abdomen and pelvis revealed a small sub centimeter cyst in the liver, 2 small hypodense lesions in the spleen and renal pole of left kidney, but otherwise was unremarkable. Dental exam revealed no tooth decay. Cardiology was consulted and the

patient underwent a transesophageal echocardiogram which revealed a large mobile vegetation on the anterior leaflet of the mitral valve, associated with an abscess on the valve annulus. The vegetation measured 1.29cmx0.74cm. Cardiothoracic surgery consultation was promptly obtained. However, shortly after the TEE, the patient developed acute aphasia. Code stroke was called, and subsequent MRI of the brain revealed cortical infarcts in the left frontal and parietal lobes, right middle frontal gyrus, right centrum semiovale and right cerebellum, concerning for septic emboli. Repeat MRI brain revealed evolution of infarcts to involve the majority of the left MCA territory. The patient underwent an IR-guided embolectomy with near-total recovery of his neurologic deficits. Coronary angiogram revealed no coronary artery disease. The patient ultimately underwent successful bioprosthetic mitral valve replacement. Antibiotics were transitioned to ceftriaxone 2gm IV q24hours. He clinically improved, therefore was discharged and completed a six-week course of IV antibiotics.

### Discussion

Infective endocarditis is a rare condition occurring in approximately 3-10 people per 100,000 in industrialized countries.<sup>2</sup> The most common pathogens for IE are staphylococci spp, streptococci spp, and enterococci. There are limited reports and knowledge related to lesser-known pathogens, such as *Gemella spp*. *Gemella* is a genus consisting of gram-positive cocci that is usually found in oral cavities or digestive and urogenital tracts. The genus has six species: *Gemella haemolyans*, *morbilloorum*, *bergeri*, *sanguinis*, *palaticanis*, and *cuniculi*.<sup>3</sup> It was first isolated by Collins et al. in 1998 from six febrile patients. Three of these patients were diagnosed with subacute bacterial endocarditis.<sup>4,5</sup> *Gemella spp* may rarely cause systemic illness. However, it has been implicated in several cases of severe infections,<sup>1</sup> notably infective endocarditis.<sup>2,6,7</sup> A 2021 systematic review of 83 articles involving terms including “*gemella*” and “endocarditis” identified risk factors to include male gender, congenital heart disease, valvular abnormalities, recent bowel surgery, and oral cavity infections. Mitral and aortic valves were most commonly affected,<sup>3</sup> although one case of *Gemella* endocarditis involving tricuspid valve was reported in 2015.<sup>8</sup> *Gemella spp* is usually susceptible to penicillin, vancomycin, cephalosporins, macrolides, and aminoglycosides. Empiric treatment of infective endocarditis by *Gemella spp* is recommended with combination therapy of beta-lactams and aminoglycosides for at least six weeks and/or valve replace-

ment. Despite treatment patients commonly suffer cardiovascular, renal, and neurologic complications, including embolic strokes.<sup>3</sup> The challenge in diagnosing *Gemella* endocarditis is that these organisms are typically slow growing and are difficult to isolate. A case series of patients with *Gemella* endocarditis reported a third of patients had negative blood cultures. These patients were diagnosed with *Gemella* with PCR testing of the explanted valve after valve repair.<sup>9</sup> Advances in microbiology and testing have led to higher yield and successful detection of these organisms. *Gemella* infections are uncommon, and cases of *Gemella* endocarditis remain extremely rare. However, it is important to properly identify, recognize, and treat this infection given the significant morbidity and mortality associated with *Gemella* endocarditis.

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