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## Case report

Obstructive heart failure with *Cardiobacterium hominis* infective endocarditisAnita Singh<sup>a</sup>, Angel Porras<sup>a</sup>, Francisco Ujueta<sup>a,\*</sup>, Saberio Lo Presti<sup>b</sup>, Nicholas Camps<sup>c</sup><sup>a</sup> Department of Internal Medicine, Mount Sinai Medical Center, 4300 Alton Road, Miami Beach, FL, USA<sup>b</sup> Columbia University Division of Cardiology, Mount Sinai Medical Center, 4300 Alton Road, Miami Beach, FL, USA<sup>c</sup> Department of Infectious Diseases, Mount Sinai Medical Center, 4300 Alton Road, Miami Beach, FL, USA

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## ABSTRACT

We illustrate the progression of *Cardiobacterium hominis* infective endocarditis in a patient with a bioprosthetic mitral valve and decompensated heart failure secondary to an obstructive septic vegetation.

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## Introduction

*Cardiobacterium hominis* is a fastidious pleomorphic gram-negative bacillus belonging to the HACEK group of microorganisms (*Haemophilus species*, *Aggregatibacter species*, *Cardiobacterium hominis*, *Eikenella corrodens*, and *Kingella species*), accounting for approximately 1–2% of community acquired cases of native valve endocarditis [1]. *C. hominis* mainly exists as normal oral flora, with a low virulence in causing infective endocarditis (IE), with the exception in patients with a history of valvular disease [2]. The onset of disease is indolent often following dental and endoscopic procedures [2,3].

## Case report

A 73-year-old male presented to the emergency department with worsening generalized weakness and unintentional weight loss of 20 pounds for three months. Review of systems was positive for chills, night sweats, and dyspnea on exertion. He was found to be in atrial fibrillation with moderate respiratory distress and hypotension requiring vasopressors. Physical examination was notable for cachexia, poor dentition, bilateral lower extremity

edema, and a 4/6 systolic murmur was auscultated over the left sternal border.

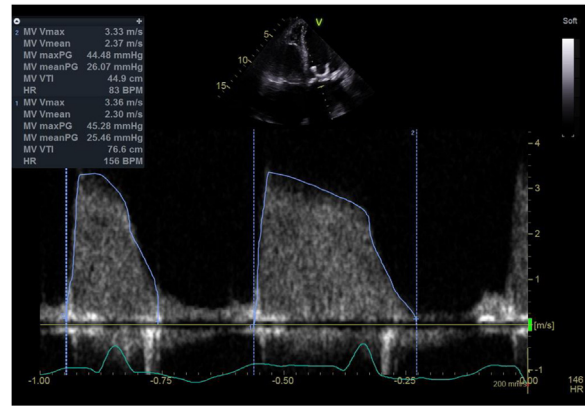
Past medical history was notable for hypertension, non-ischemic cardiomyopathy with reduced ejection fraction NYHA II, paroxysmal atrial fibrillation on no anticoagulation due to history of Osler Weber Rendu syndrome, hereditary hemorrhagic telangiectasia (with prior intracranial hemorrhage due to cerebral arteriovenous malformation), and severe mitral regurgitation due to Barlow's myxomatous degeneration status post failed mitral valve repair in 2006 with complicating ring dehiscence and subsequent bioprosthetic mitral valve replacement in 2013 (33 mm Hancock II). Three months prior to presentation he underwent endoscopic removal of a gastric carcinoid tumor. Additionally, the patient underwent deep dental cleaning six months prior to presentation with antibacterial prophylaxis with oral amoxicillin 2 g.

Initial laboratory workup was notable for a neutrophil predominant leukocytosis (WBC 15,000/ $\mu$ L). Chest radiograph revealed small bilateral pleural effusions and pulmonary edema (Fig. 1). Electrocardiogram demonstrated atrial fibrillation with a heart rate of 100 bpm with nonspecific ST and T wave changes. Transthoracic echocardiogram revealed an ejection fraction between 30–35% with severe tricuspid regurgitation and bioprosthetic mitral valve thickening and hemodynamic profile consistent with obstructed valve (Figs. 2 and 3), warranting transesophageal echocardiogram (TEE). The TEE showed infective vegetative material encasing the bioprosthetic leaflets, resulting in mitral valve obstruction (Fig. 4). Blood cultures drawn at admission

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**Fig. 1.** Anteroposterior chest x-ray revealing an enlarged cardiac silhouette, pulmonary edema, small bilateral pleural effusions, and prosthetic mitral valve.



**Fig. 3.** Transthoracic apical 4 chamber view with spectral doppler interrogation demonstrating elevated transmittal gradients.

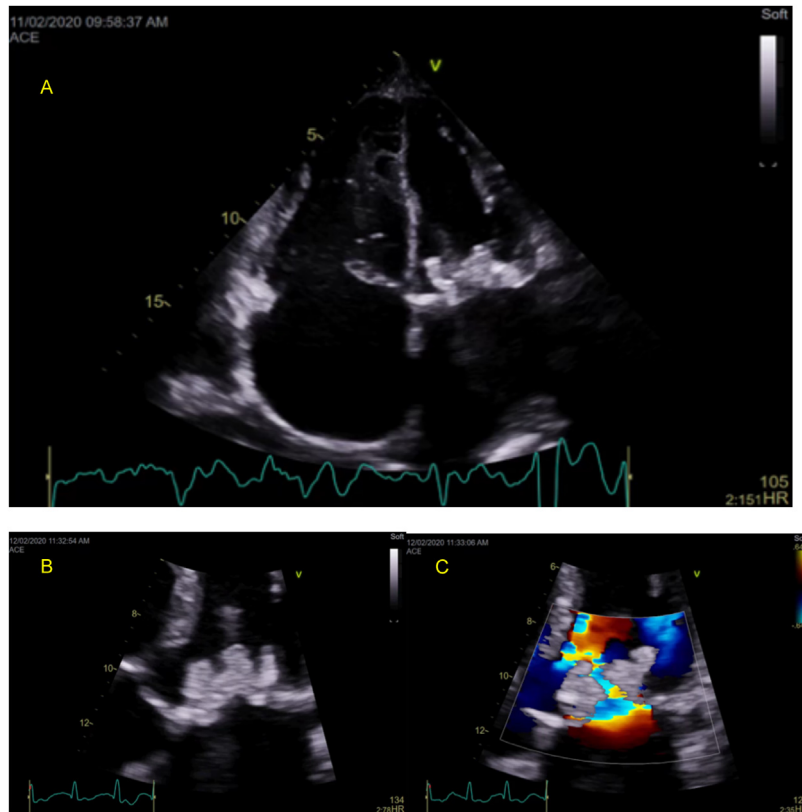
grew *Cardiobacterium hominis* after 4 days and speciation after 6 days (Fig. 5).

The patient was started on empiric antimicrobial therapy with vancomycin and cefepime for presumed prosthetic valve infective endocarditis. The TEE showed infective vegetative material encasing the bioprosthetic leaflets, resulting in mitral valve obstruction. However, the patient was deemed a high-risk candidate for surgery due to his poor functional status and comorbidities. Blood cultures were positive for *Cardiobacterium*

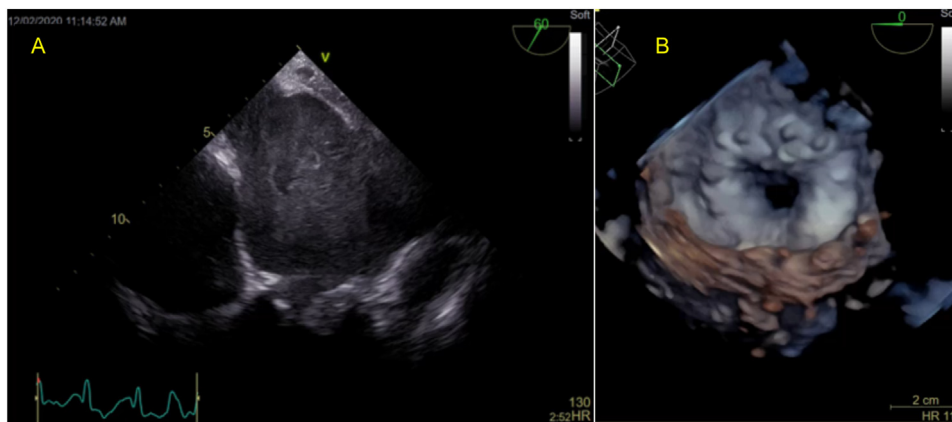
*hominis* on day four of hospital stay and antimicrobial therapy was deescalated to ceftriaxone.

**Discussion**

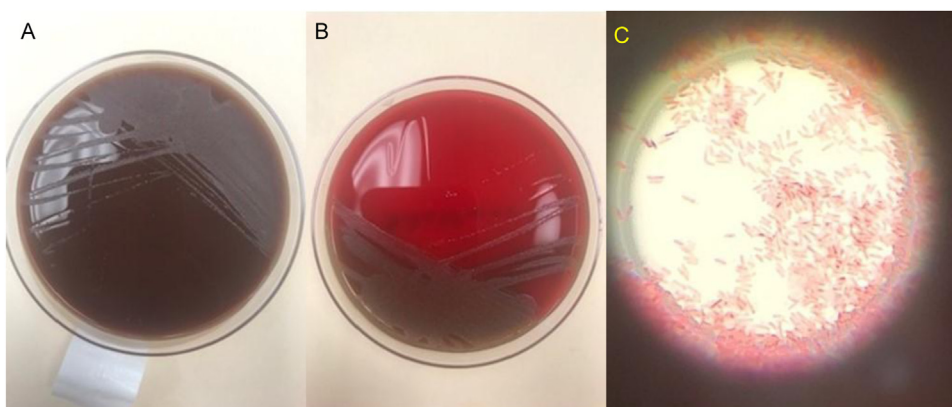
*C. hominis*, a relatively low virulence organism, has been known to cause infective endocarditis in up to 95% of cases of bacteremia. *C. hominis* is known to cause large friable vegetations, which are often complicated by heart failure and central nervous system embolism [2]. A previous study reported the most common pre-existing risk factor of *C. hominis* is cardiac disease (61%), with 28% having a prosthetic valve [4].



**Fig. 2.** Panel A: Transthoracic apical 4 chamber view demonstrating biatrial enlargement, right ventricular dilation, and bioprosthetic mitral valve thickness. Panel B: Magnified imaging of the bioprosthetic mitral valve encased by infective vegetative material. Panel C: Color doppler interrogation of the bioprosthetic mitral valve with turbulent and restrictive flow across the valve.



**Fig. 4.** Panel A: Transesophageal echocardiogram, mid esophageal 4 chamber view at 60° with magnified view of the left atrium demonstrating significant spontaneous echo contrast. Panel B: 3D-reconstruction demonstrating thickened valve prosthesis and decreased orifice area.



**Fig. 5.** Microbiology: Panel A and B revealed no growth on blood and chocolate agar at day 3. Panel C revealed pleomorphic, gram negative bacillus consistent with *Cardiobacterium hominis*.

74 Although some guidelines and systematic review do not  
75 recommend antibacterial prophylaxis after all dental procedures,  
76 it is standard for patients with risk factors for IE and at risk for  
77 complications. These risk factors include underlying cardiovascular  
78 disease, apparent poor dental hygiene, previous and manipulation of  
79 the gingival tissue [5]. Although causing transient bacteremia,  
80 guidelines recommend against the use of prophylactic antibacterials  
81 during endoscopic procedures, although cases of *C. hominis*  
82 endocarditis after endoscopic procedure have been described  
83 [5-7]. Bacterial translocation of microbial flora is postulated to  
84 occur secondary to mucosal trauma, related to instrumentation [8].  
85 Procedures that result in dilation of esophageal strictures may have  
86 higher predisposition to produce bacteremia [9]. Evidence indicates  
87 that rates of bacteremia may be elevated in esophageal and  
88 endoscopic procedures involving manipulation of malignant tissue  
89 [10]. As demonstrated in this case, our patient received antibacterial  
90 prophylaxis with amoxicillin prior to deep cleaning given his  
91 medical history. Given the time course between the procedure, it is  
92 uncertain if there is a causative relationship between dental  
93 procedure and onset of symptoms.

94 Currently, there exists a paucity of research linking *C. hominis*  
95 infection to endoscopic procedures. Given that patients with  
96 esophageal and gastric cancers often possess co-morbidities that  
97 place them at higher risks for infective endocarditis and  
98 complications associated with IE, it is reasonable to further  
99 explore the association between these procedures and IE or offer

prophylactic antibacterials to individuals with risk factors for IE  
such as mitral valve repairs.

**Conclusions**

Clinicians should be aware of the risk factors for *C. hominis*  
especially in patients with bioprosthetic valves. It is reasonable to  
explore the association between endoscopic procedures and  
infective endocarditis and consider prophylactic antibiotics.

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**Consent**

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this journal on request.

**Author contribution**

Anita Singh- Writing/data collections.  
Angel Porrás- Writing/data collections.

117 Francisco Ujueta- Imaging, Saberio Lo Presti- Imaging, Nicholas  
118 Camps- Writing.

### 119 Declaration of Competing Interest

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