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Abstract
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Reference

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Capnocytophaga canimorsus Prosthetic Aortitis in an HIV-Positive Woman

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A 49-year-old woman with a 15-year history of HIV-hepatitis C virus coinfection had aortic valve and ascending aorta replacement in 2007. She presented with abdominal pain, episodic diarrhea, and profuse sweating in 2010. Thoracoabdominal positron emission tomography-computed tomography finally suggested infectious aortitis, a diagnosis confirmed by a blood culture positive for Capnocytophaga canimorsus.

CASE REPORT

A 49-year-old woman consulted her HIV specialist because of abdominal pain. Her medical history included HIV-hepatitis C virus coinfection contracted through intravenous opiate addiction complicated by cytomegalovirus retinitis leading to total bilateral blindness (1996). She had long-standing hypertension complicated by an ascending aortic dissection treated in 2007 by aortic valve and ascending aorta replacement surgery (modified Bentall surgery). In January 2008, computed tomography (CT) revealed some dissection of the descending aorta with a false channel of 2.3 cm. In April 2010, the patient presented with 5 days of abdominal pain, diarrhea, and diahrroes without fever. Outpatient investigations showed an elevated C-reactive protein (CRP) level with negative procalcitonin (PCT) and stool culture findings but thickening of the proximal and median parts of the colonic wall on the abdominal CT scan. Five days later, the patient was admitted to our hospital with a low-grade fever (38.2°C), abdominal tenderness of the left lower quadrant, and percussion tenderness of the left costovertebral angle. Her laboratory results included a hemoglobin level of 133 g/liter, a white blood cell count of 11.7 × 10⁹/liter without nonsegmented neutrophils, an undetectable HIV RNA load, a CD4 cell count of 250/µl (29%), a CRP level of 373 mg/liter, a PCT level of 0.23 µg/liter, an aspartate aminotransferase level of 68 U/liter, an alanine aminotransferase level of 49 U/liter, a gamma-glutamyl transferase level of 750 U/liter, and negative urine and stool cultures. Colonoscopy revealed an edematous colonic wall with no significant abnormality found through biopsies. Spondyloodiscitis was excluded by magnetic resonance imaging of the spine, but gadolinium-injected thoracoabdominal CT showed a 6-cm-wide para-aortic thoracic thrombosis with deterioration of the descending aortic dissection as the false channel diameter had increased to 3.7 cm at the thoracic level. Initially, thoracic surgeons observed no indication for immediate surgery and CT monitoring at 6 months was planned. During the following week, the patient had intermittent fever with a persistent high CRP level, but daily blood cultures remained negative. Thoracoabdominal positron emission tomography (PET)-CT with [18F]fluorodeoxyglucose (FDG) was performed to investigate the fever of unknown origin and showed an intense uptake at the para-aortic thoracic thrombosis already described (Fig. 1). As this examination strongly suggested a diagnosis of infectious aortitis, the European homograft bank was notified and the patient was listed for an urgent homograft replacement. An empirical intravenous course of amoxicillin-clavulanic acid was initiated. A few days later, the patient experienced a worsening of her back pain, the leukocytosis and CRP level increased, and a new CT scan revealed acute enlargement of the aortic aneurysm, from 5 by 7 cm to 8.5 by 11.5 cm, compatible with an impending rupture. An emergency aortic replacement was performed, with operative findings showing no signs of infection but a ruptured aneurysm attached to the left inferior pulmonary lobe. The aorta was successfully repaired with a Dacron graft following a pulmonary lobectomy—the size of the homograft proving to be insufficient for implantation. Acridine orange staining of a sample of the aortic wall showed leukocyte infiltrates with rod-shaped bacteria. At the same time, an aerobic blood culture drawn 5 days earlier also became positive for acridine orange-stained rods. The growth and biochemical characteristics of these bacteria were consistent with those of Capnocytophaga species, and they were definitively identified as Capnocytophaga canimorsus by 16S rRNA gene sequencing. Immediate postoperative care was complicated by massive hemorrhage at the operative site, which resulted in a 2-min cardiopulmonary arrest. The patient was promptly resuscitated, the bleeding was stopped after a perfusion of recombinant coagulation factor VIIa, and the antibiotic therapy was switched to piperacillin-tazobactam. A second hemorrhagic shock occurred 1 week later and was also successfully managed by the ligation of one of the left intercostal arteries. This third operation probably resulted in a permanent spinal cord ischemic injury, because complete paraplegia was observed postoperatively. After 3 weeks of failure to wean the patient off mechanical ventilation because of intercurrent Pseudomonas aerugi-nosa nosocomial pneumonia and left lung superior lobe

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atelectasis, a withdrawal of all life-sustaining treatments was agreed upon by the patient, her family, and the medical staff.

*C. canimorsus* is a capnophilic, Gram-negative rod present in the normal oral flora of dogs and cats. *Capnocytophaga* species are fastidiously growing bacteria whose isolation frequently requires more than 2 days of growth under optimal anaerobic conditions in Trypticase soy agar with 5% sheep blood (BA medium).

The mode of transmission of a *C. canimorsus* infection generally involves an animal bite (54% of reported cases) or scratch (8.5%) or only animal contact (27%) (1). The patient described here was assisted by a guide dog. While the patient sustained no bites from her pet, this close contact likely predisposed her to infection.

Because of low virulence and wide susceptibility to the antibiotics prescribed as prophylaxis after a dog bite, most systemic infections occur in hosts with impaired immunity, e.g., asplenic patients (33%), alcoholics (24%), and other immunocompromised patients (5%), though previously AIDS has never been reported as a predisposing factor (1). In the largest review of *C. canimorsus* infection case reports, 94% of 103 patients had systemic infections, mainly septicemia (94 cases), associated with meningeal (13 cases) or cardiac (11 cases) localization (1). The initial presentation in *C. canimorsus* bacteremia usually involves constitutional symptoms such as fever, chills, myalgia, and malaise (2). Gastrointestinal complaints, which were also observed in our patient, were frequently encountered in this review, including vomiting (31%), abdominal pain (26%), and diarrhea (26%).

This is the third reported case of an aortic mycotic aneurysm caused by *C. canimorsus*. The two previous reports (3, 4) with similarities to our case described two sexagenarian males with known cardiovascular risks complaining of fever, constitutional symptoms, and increasing lower back pain. They both reported wounds contaminated with dog saliva a few weeks before the onset of the symptoms, one from a minor bite to the hand and the other from a licked scratch on the forearm. Inpatient investigations showed marked leukocytosis, a systemic inflammatory response syndrome, and an aortic aneurysm found on the CT scan, all pointing to a possible diagnosis of infectious aortitis. Both of these previous cases required emergency surgery because of the worsening condition of a contained rupture of the aorta. The final diagnosis was made by culture or 16S rRNA PCR performed directly with an aortic specimen, but all blood cultures remained negative despite repeated sampling. Prolonged periods of negative blood cultures have already been described in a case review of *C. canimorsus* endocarditis (5), which prompted the authors to include this fastidious organism in the HACEK group (*Haemophilus parainfluenzae*, *H. aphrophilus*, *H. paraphrophilus*, *Actinobacillus actinomycetemcomitans*, *Cardiobacterium hominis*, *Eikenella corrodens*, and *Kingella* species). Blood cultures taken from our patient were positive but only after 17 samples were collected over a period of 3 weeks. Broad-range PCR amplification of the 16S rRNA gene and sequencing of the amplified product were performed as previously described (6).

After successful surgical management, a prolonged course of intravenous carbapenems resulted in complete recovery in both previous cases. The unfavorable clinical evolution of our patient illustrates the high fatality rate of *C. canimorsus* septicemia; the largest review (2) reported an overall mortality rate of 31%. Moreover, from the time the diagnosis of infectious aortitis was suspected on the basis of PET-CT with FDG until empirical antibiotherapy was initiated, 1 week had elapsed. Five days later, the patient had to undergo emergency surgery because of an impending rupture of the aneurysm, a situation that worsened the preoperative prognosis.

This case emphasizes the difficulty in establishing an early diagnosis of infectious aortitis, especially if the offending pathogen is hard to grow. PET-CT with FDG must be considered as an emerging tool if other imaging modalities have failed to ascertain the infectious origin of abnormal radiological findings compatible with acute aortitis. Intravenous antibiotic therapy with broad anti-

![FIG 1 Coronal and sagittal section on thoracoabdominal PET-CT with FDG. The hypermetabolic para-aortic areas (yellow-white) are suggestive of an active inflammatory process.](jcm.asm.org)
microbial coverage should be initiated as soon as the diagnosis is suspected, in combination with complete surgical excision of the infected aorta. Antimicrobial therapy prior to surgery improves local surgical conditions, but the patient must be carefully monitored during this critical period to detect signs of impending aortic rupture. Preoperative antibiotherapy may not jeopardize microbial identification when using a broad-range PCR technique (targeting the 16S rRNA gene) performed directly with infected aortic tissue.

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