

Aortic Valve Endocarditis Caused by *Bartonella Henselae*: A Rare Surgical Entity

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ABSTRACT

We report a case of aortic valve endocarditis caused by *Bartonella henselae*. The patient initially presented to a regional hospital with generalized symptoms including lethargy, malaise and decreased appetite. Transthoracic echocardiogram revealed a large vegetation on the aortic valve and he was treated empirically with broad spectrum intravenous antibiotics. Several blood cultures were obtained which all returned negative results and the white blood cell count was normal. He was transferred to our hospital, with persistence of his initial symptoms and additional low-grade fevers. In light of his negative culture results, serological testing for *Bartonella* and *Chlamydia* was performed, which gave a positive result for *Bartonella henselae*. In view of this result and following development of severe aortic valve insufficiency, he underwent an aortic valve replacement and made a good recovery.

INTRODUCTION

In 1986, special blood culture techniques isolated a new bacterial species *Bartonella henselae* [Slater 1990]. A fastidious organism capable of causing bacterial endocarditis, inguinal adenopathy, cat scratch disease, cutaneous lesions (bacillary angiomatosis) and relapsing bacteremia in immuno-compromised as well as immuno-competent patients with persistent fevers [Slater 1990, Tappero 1993, Drancourt 1996].

CASE REPORT

A 50-year-old male owner of two cats, with no previous significant medical history presented to a regional hospital in North Queensland, Australia, with an 18-month history of lethargy, malaise and decreased appetite. These symptoms worsened with arthralgia and swelling of the left ankle, he denied any fevers, chills or night sweats. On physical examination, he was found to have a systolic cardiac murmur and non-tender hepato-splenomegaly. A transthoracic echocardiogram

was done showing moderate aortic valve insufficiency with large vegetation on its leaflets. Blood cultures were obtained, and the patient was placed on empiric antibiotics including flu-cloxacillin and gentamicin. His blood count showed anemia and a normal white cell count. Q fever and HIV serology were negative. He was transferred to our hospital, where his blood was re-cultured and benzylpenicillin was added to the antibiotic regimen. Blood cultures continued to be negative. During the three-week hospitalization, the patient had low-grade fevers and complained of severe headaches. A CT scan of his brain revealed that it was normal. Serology for *Bartonella* and *Chlamydia* were obtained. The results for *Bartonella henselae* IgG titers were positive with a value of 1:2048, while the *Chlamydia* titers were negative. In preparation for surgery, in view of his age and a history of cigarette smoking, a coronary angiogram was done showing normal coronary vessels. A trans-esophageal echocardiogram demonstrated moderate to severe aortic insufficiency, preserved left ventricular function, and thickened calcified aortic valve leaflets with a large echodensity on the non-coronary cusp. These findings were consistent with chronic vegetation (see Figure 1 and movie, ©).

The patient underwent aortic valve replacement. Intra-operative findings confirmed the presence of large vegetation on a bicuspid aortic valve. The leaflets were excised, the annulus decalcified, and the valve was replaced with a mechanical prosthesis.

Post-operatively, he had an episode of supraventricular tachycardia, which reverted spontaneously back into sinus rhythm. He was discharged from the hospital with recommendations to continue with oral antibiotics for six months.

Bartonella henselae DNA was detected in the excised valve by polymerase chain reaction.

DISCUSSION

Bartonella species are an important cause of culture negative endocarditis [Raoult 1996, James 2000], with an incidence up to 3% as reported by Didier Raoult [Raoult 1996]. These gram-negative bacilli are difficult to culture [James 2000] and will often go undiagnosed unless specifically considered among differential diagnosis. Breathnach stated that serology is a reliable way to make the diagnosis, and *bartonella* antibodies should be sought routinely in any case of culture

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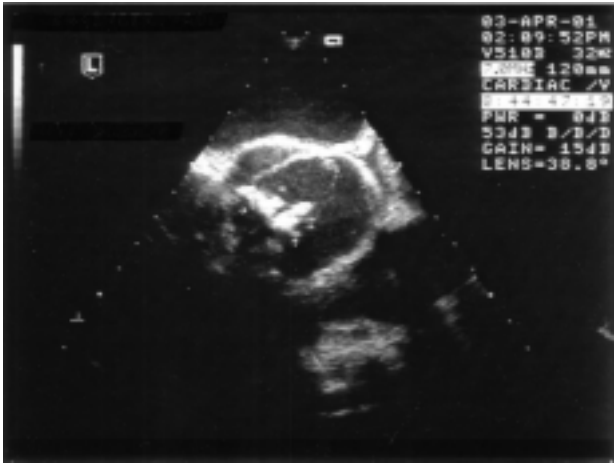


Figure 1.

negative endocarditis, particularly if the patient is homeless, of poor hygiene, or a cat owner [Breathnach 1997].

Several types of *Bartonella* bacteria have been identified as causative agents in both human and animal infections. Those species responsible for human infection include *B. henselae*, *B. quintana* and *B. elizabethae*.

Risk factors for *B. quintana* infections include poor socioeconomic conditions, chronic alcoholism and homelessness [Raoult 1996] and immunodeficiency [Drancourt 1995], while cat contact [Koehler 1994, Raoult 1996] and pre-existing cardiac valvular disease [Raoult 1996] are risks for *B. henselae*.

Interestingly Raoult, in a series of 22 patients diagnosed with *Bartonella* endocarditis, showed that a *Bartonella* species titer of 1:1600 or more had a positive predictive value of 0.884 [Raoult 1996].

Koehler and co-workers documented a direct association between *B. henselae* bacillary angiomatosis infection in humans and exposure to pet cats with *B. henselae* blood infection. They identified the cat as a large, asymptomatic reservoir for human *B. henselae* infection with additional evidence suggesting that the cat flea is a potential vector of *B. henselae* [Koehler 1994] and this was also reported by Kenneth Zangwill [Zangwill 1993].

Jordan Tappero described bacillary splenitis as another manifestation of *B. henselae* infection with a clinical spectrum beginning with fever and bacteremia, progressing to bacillary splenitis and recommended treatment with erythromycin or doxycycline for at least six weeks when the diagnosis is confirmed [Tappero 1993].

Our patient's clinical presentation, risk factors, lack of response to medical therapy, strongly positive blood serology and DNA studies of the aortic valve specimen are consistent with previously reported cases of endocarditis caused by *B. henselae* [Drancourt 1996, Baorto 1998].

Surgical intervention with valve replacement is almost always indicated due to frequent failure of conservative thera-

py and hemodynamic instability. Edward James suggests consideration be given for early surgery if positive serological results are obtained [James 2000].

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REVIEW AND COMMENTARY

1. Editorial Board Member AR11 writes:

I think the authors should try to convince the readers that *Bartonella* was indeed the organism that caused the vegetation. A single passing comment that the organism's DNA was found by PCR (not immuno-histochemistry) is hardly definitive causal evidence. Organisms on pathology sections, gram stain, or culture would do much to strengthen the position that this was indeed the causative agent.

Authors' Response by Santiago Endara, MD:

The diagnosis of *Bartonella henselae* endocarditis was based on several laboratory results. These included: blood Serology for *Bartonella* with strongly positive *Bartonella henselae* IgG titers, with a value of 1:2048 (IgG titers of \geq 256 suggest recent infection and a value of 1:1600 or more had a positive predictive value of 0.884 as per reference #6) and excised aortic valve tissue was positive for *Bartonella henselae* DNA (NAA) by polymerase chain reaction.

These results and the patient's medical history, risk factors and several negative sets of blood cultures are strong indicators for the diagnosis.