Hellenic Journal of Cardiology (2016) **57**, 271–272

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CASE REPORT

Implantable cardioverter device infection due to *Brucella melitensis* in two patients

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Received 28 August 2014; accepted 2 June 2015
Available online 20 August 2016

KEYWORDS
Brucella;
Endocarditis;
Lead extraction

1. Introduction

Brucella melitensis has been reported in limited cases of rhythm device infection and has been described as being insidious in its progression. In this report, we emphasize the role of tissue and pocket-fluid extended cultures, especially in patients coming from brucella-endemic areas. While tissue cultures may confirm diagnosis in these patients, they typically have negative blood and swab cultures.

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Peer review under responsibility of Hellenic Cardiological Society.

2. Case One

A 54-year-old female with long-standing idiopathic dilated cardiomyopathy and a low ejection fraction underwent implantation of Cardiac Resynchronization Therapy with a Defibrillator (CRT-D) in 2007. A pulse generator replacement was subsequently required in 2012. Two years later, the patient began having intermittent febrile illness and joint pain. She was thoroughly investigated without a final conclusion in her local hospital, and her symptoms progressed insidiously. Two months prior to her current presentation, she noticed a papular lesion over the device area with an intermittent purulent discharge. An initial evaluation at our center showed clinical evidence of a device pocket infection, and her inflammatory markers were high, though multiple blood cultures were negative, Based on the clinical presentation and the patient's history of raw milk ingestion, a Brucella device infection was suspected. The Brucella agglutination titer was 1:20480, and the IgG Brucella antibody titer was 1:1280. A trans-esophageal echo showed large masses attached to all leads. A complete

http://dx.doi.org/10.1016/j.hjc.2015.06.004

system removal was achieved using a CVX-300 Excimer laser extraction system (*Spectranetics, Colorado Springs, CO, USA*) and Lead Locking Device (LLD)(Fig. 1). Extended culture from the device pocket fluid and tissues showed growth of *Brucella melitnesis*. The patient began an extended antibiotic regimen and demonstrated excellent clinical and serological improvement. A contralateral device re-implantation was scheduled three months after the CRT-D System removal.

3. Case Two

A 52-year-old male with a long-standing history of diabetes underwent coronary arteries bypass graft and mitral valve repair in 2010. He received a single chamber ICD as a secondary prevention of sudden cardiac death in 2012. One year later, he was diagnosed as having Brucellosis and received appropriate treatment for eight weeks with an excellent response. Two months prior to his current presentation, he noticed changes in the skin color over the device site, which had gradually eroded resulting in device extrusion (Fig. 2). His inflammatory markers were high, but repeated blood cultures were negative, as was a swab from the device site. He underwent a complete system removal,

Figure 1 Laser extracted ventricular ICD lead showing a small mass attached to the distal part of a heavily encapsulated lead.

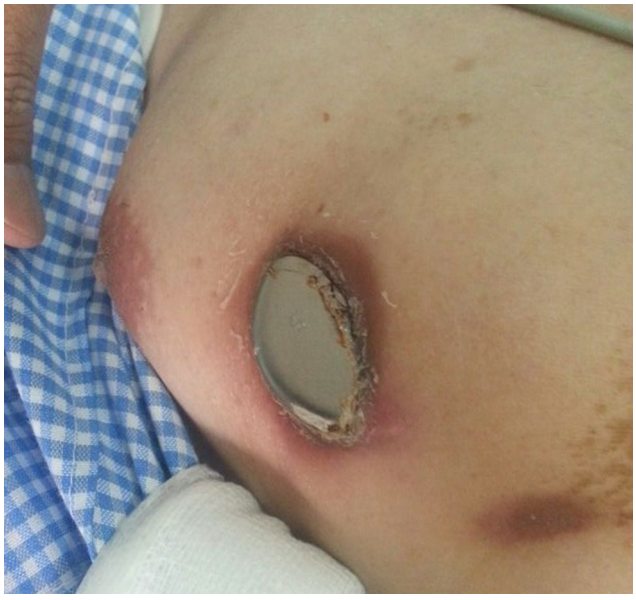

Figure 2 ICD pulse generator eroding throughout the skin.

which was achieved by simple traction using an LLD. Extended pocket tissue culture revealed growth of *Brucella mellitensis*. He received an antibiotic combination regimen for Brucella including Co-trimaxazole, Doxycycllinand, and Gentamicin for an extended period. A contralateral ICD re-implantation was scheduled for three months post-removal.

4. Discussion

Despite the improvement in procedural technique and administration of antibiotic prophylaxis, device infections continued to occur.[1] *Brucella melitensis* has only been reported in several cases of rhythm device infection and has been described as being insidious in its progression.[2–4] It is possible that device infection might occur during the asymptomatic phase of the illness as a result of the initial bacteria micro phase; the bacteria colonize the device collagen capsule and react as a permanent focus of infection, even after the standard regimen of treatment.[5] Optimal management of infected devices should include removal of the whole system and prolonged antimicrobial therapy to eliminate the pathogen from the body, especially in the presence of an unusual organism.[1] In all previously reported cases of Brucella infection, device removal and leads extraction followed by extended antibiotic therapy were required for its cure.[2–4] In this report, we emphasize the role of tissue and pocket-fluid extended cultures, especially in patients coming from a brucella-endemic area.[6] In the past century, the introduction and widespread application of sternal aspiration for studying living bone marrow have given clinicians a simple and practical method for studying and diagnosing diseases, such as brucellosis.[7] In our patients, repeated blood and swab cultures were negative during all phases of infection, but tissue cultures confirmed the diagnosis.

Disclosures

None.

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