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Research Letter

An unusual etiological agent of implantable cardioverter device endocarditis: *Corynebacterium mucifaciens*



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A B S T R A C T

Cardiac pacing devices and implantable cardioverter defibrillator (ICD) are becoming the mainstay of therapy in cardiology and infective endocarditis (IE) and pocket infection; however, these devices require careful monitoring. Here, we describe a case of a 68-year-old female with an ICD presenting with a previously unknown etiological agent of IE, *Corynebacterium mucifaciens*.

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Currently, more than 3 million cardiac pacing systems and 180,000 implantable cardioverter defibrillators (ICDs) have been implanted worldwide.¹ Despite the obvious benefit of these implantable devices, any complications that occur are serious and life threatening to the patient especially if misdiagnosed. One of the most important complications of these implantable devices is infection, which may be associated with the pocket and the leads.

A 68-year-old female was referred to the cardiology ward of our hospital for removal of infected ICD leads. She had previously been diagnosed with dilated cardiomyopathy and an ICD was implanted for primary prevention 1 year ago. She began to suffer from mild dyspnea and fatigue, and this was followed by a weight loss of 14 kg since July 2014. The first two sets of blood cultures failed to detect any specific microorganisms perhaps due to an inappropriate use of amoxicillin clavulanate. However, a TEE in another hospital revealed a small mobile vegetation on the atrial side of the ICD lead. A hypodense lesion (abscess) in the spleen (33 mm × 25 mm) was also detected during follow-up with computerized tomography (Fig. 1). Another TEE in our facility showed a mobile vegetation with dimensions of 1.0 cm × 0.6 cm over the ICD lead on the atrial side and another vegetation with dimensions of 1.6 cm × 2.5 cm at the ostium of the superior vena cava (Figs. 2 and 3). All blood samples drawn 11 days after the previous set of samples were positive for and grew *Corynebacterium mucifaciens*. This is the first report of *C. mucifaciens* as an etiological agent of endocarditis. Medical

therapy was shifted from an IV combination of gentamycin and sulbactam – ampicillin – to teicoplanin IV. Given the large dimensions of the vegetations, a thoracotomy was performed to remove the infected ICD and a splenectomy was performed in addition to remove the abscess.

Cardiac-device-related infective endocarditis (IE) can be divided into two groups based on the time of onset as early or late IE, where 'early' indicates infection. It is called "early" cardiac-device-related IE when device-related IE occurs within the first 12 months of implantation and 'late' for infections that occur after 1 year. Staphylococci, especially the coagulase-negative species, Gram-negative bacilli, and diphtheroids are

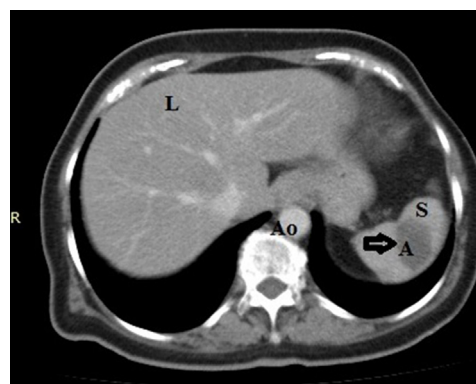


Fig. 1 – Transverse cut view of abdominal computed tomography showing abscess at spleen.

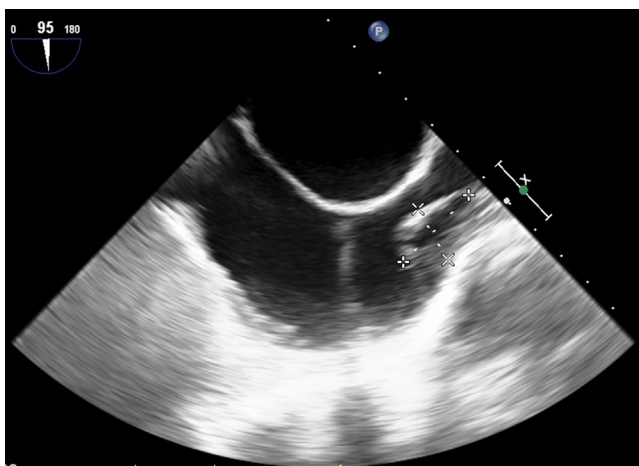


Fig. 2 – Bicaval view of TEE showing a vegetation of 1.6 cm × 2.5 cm in size at the ostium of the superior vena cava.

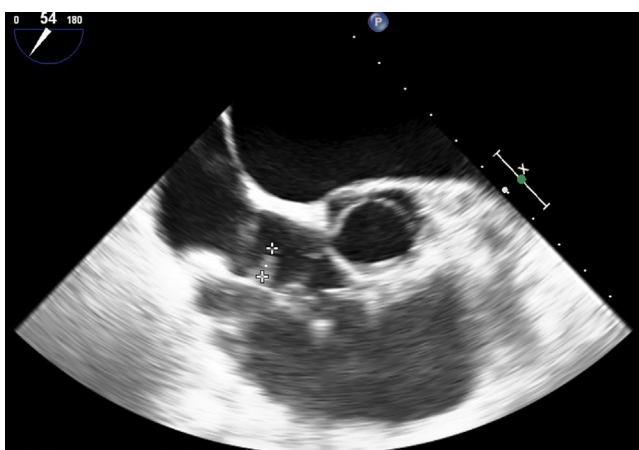


Fig. 3 – Modified short-axis view of TEE showing a vegetation of 1.0 cm × 0.6 cm in size over the ICD lead at the atrial side.

the major etiological agents of early cardiac-device-related IE, while streptococci, enterococci, and *Staphylococcus aureus* cause late device-related IE.²

While the preferred method of medically managing small vegetations (≤ 1 cm in diameter) involves percutaneous removal of the lead and generator, an explantation and change of the device system via thoracotomy may be necessary when the vegetation is bigger than 1 cm in diameter or when repair of cardiac valves or other structures is indicated.

Corynebacterium spp. are part of the normal flora and are accepted skin contaminants. However, *Corynebacterium* spp. are now thought to cause 9% of all early and 4% of all late prosthetic valve endocarditis, but only 0.2–0.4% of all cases of

native valve endocarditis.³ While reports of other species of *Corynebacterium* being associated with endocarditis have been published previously,⁴ this is the first report of *C. mucifaciens*, an etiological agent of IE.

C. mucifaciens is one of the newly described members of the genus *Corynebacterium*, grows on blood agar, and forms slightly yellow, circular, convex, mucoid colonies. It can produce acid from glycerol, glucose, fructose, and mannose and demonstrates catalase activity. It does not reduce nitrate or hydrolyze esculin and urea,⁵ and while it can be identified using standard biochemical tests, differentiation from closely related species is done using molecular biology techniques.

Conflicts of interest

The authors have none to declare.

REFERENCES

1. Chua JD, Wilkoff BL, Lee I, Juratli N, Longworth DL, Gordon SM. Diagnosis and management of infections involving implantable electrophysiologic cardiac devices. *Ann Intern Med.* 2000;133:604–608.
2. Voet JG, Vandekerckhove YR, Muyldermans LL, Missault LH, Matthys LJ. Pacemaker lead infection: report of three cases and review of the literature. *Heart.* 1999;81:88–91.
3. Murray A, Karchmer B, Moellering AR. Diphtheroid prosthetic valve endocarditis: a study of clinical features and infecting organisms. *Am J Med.* 1980;69:838–848.
4. Oliva A, Belvisi V, Iannetta M, et al. Pacemaker lead endocarditis due to multidrug-resistant *Corynebacterium striatum* detected with sonication of the device. *J Clin Microbiol.* 2010;48:4669–4671.
5. Funke G, Lawson PA, Collins MD. *Corynebacterium mucifaciens* sp. nov., an unusual species from human clinical material. *Int J Syst Bacteriol.* 1997;47:952–957.

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