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IMAGE

Unusual Hydatid Cyst-Like Images Caused by *Staphylococcus Lugdunensis* Infective Endocarditis

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Discussion

A 66-year-old man with a personal history of ischaemic dilated cardiomyopathy treated with an implantable cardioverter defibrillator (ICD) for secondary prevention presented with a 2-months history of fever, chills and general discomfort shortly after device upgrade to ICD-CRT (cardiac resynchronisation therapy). Blood cultures were positive for *Staphylococcus lugdunensis*.

Transoesophageal echocardiography (TEE) showed multiple and mobile vegetations on the pacemaker auricular wire with a maximum size of 20 × 12 mm predominantly in the superior vena cava (SVC) ostium. Additionally, a pedunculated hydatid cyst-like, 12 × 11 mm image was evident and apparently connected to the vegetations in the SVC ostium (Figure 1A, 1B, 1C, 1D). It consisted of a solid centre surrounded by a thin membranous structure, possibly fibrin, separated by a fluid compartment. Cardiac device-related infective endocarditis diagnosis was established [1].

Under TEE guidance, ICD-CRT system was extracted 5 days later. At least five vegetations were evident and the hydatid cyst-like image presented with a usual vegetation appearance since the surrounding membrane had disappeared (Figure 1E). Due to vegetation persistence, surgical complete removal and epicardial ICD-CRT implantation was performed. Tissue samples were analysed, and pathologic diagnosis was ''abscessified endocarditis verrucosa" (Figure 1F).

Computed tomography (CT) pulmonary angiography and cranial CT scan ruled out pulmonary and cerebral septic emboli. Targeted antimicrobial therapy was maintained for one month and control transthoracic echocardiography showed no endocarditic lesions. The patient has remained asymptomatic since hospital discharge, with a New York Heart Association (NYHA) functional class I and a completely independent grade of activity.

Staphylococcus lugdunensis is a coagulase-negative staphylococcus which can rarely cause infective endocarditis. Only a few cases have been reported and the organism should not be treated as a contaminant of blood cultures because the infections due to this staphylococcus species have been reported to be very destructive of cardiac tissue, like *Staphylococcus aureus* infective endocarditis [2]. Due to its virulence, some authors propose that *S. lugdunensis* isolation in blood cultures should be considered

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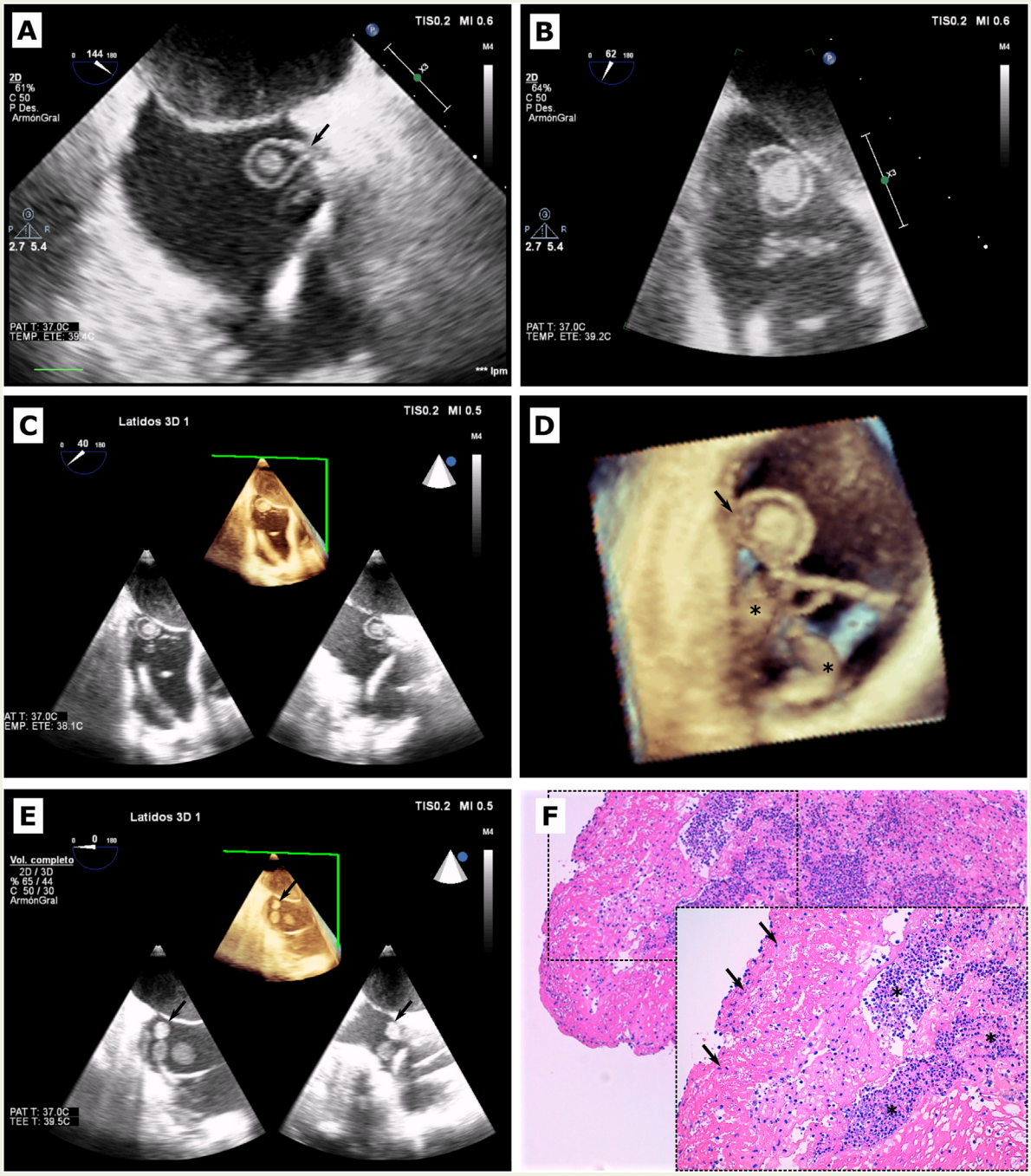

Figure 1 **A, B**: TEE of the hydatid cyst-like vegetation. Note the solid central mass, connected to the SVC ostium (arrow), surrounded by a thin membrane and separated by an anechoic compartment. **C, D**: 3D reconstruction and X-plane. Note the pedunculus in the SVC ostium (arrow) and other vegetations arising from the pacemaker right atrial wire (asterisk). **E**: TEE with 3D reconstruction and X-plane during the ICD-CRT system removal. Vegetations have increased in number and the previously resembling hydatid cyst vegetation has changed (arrow). **F**: histologic analysis of the vegetation (detail). Note the fibrinous necrosis in the periphery (arrow) and the central purulent necrosis with polymorphonuclear leukocytes infiltrate (asterisk).

pathogenic, and thus infective endocarditis should be considered [3]. Moreover, *S. lugdunensis* has also been identified in some cases of cardiac device-related infective endocarditis [4].

Echocardiographic findings in this case were reminiscent of a hydatid cyst, a parasitic infection caused by *Echinococcus granulosus* that affects the heart only in 0.5-2% of the patients and requires surgical removal [5,6]. Other differential

diagnoses were considered, such as bronchogenic cyst, blood cyst and thrombus. However, the presence of multiple traditional appearing masses consistent with vegetations on the ICD-CRT wire and, ultimately, the morphological change in the hydatid cyst-like image prompted the diagnosis of infective endocarditis. A similar case of mitral native *Staphylococcus aureus* infective endocarditis mimicking a hydatid cyst has been reported [7].

In summary, it is important to note that, even though cystic images are a very unusual finding in cardiac imaging, infective endocarditis can atypically present with hydatid cyst-like images. A thorough differential diagnosis and subsequent investigations should be performed to confirm diagnosis and provide the patient with the best possible treatment.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.hlc.2018.07.008.

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