

^{18}F -FDG-PET and CT fusion imaging in a differential diagnosis of residual intracardiac masses after removal of implantable cardioverter defibrillator due to endocarditis

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An increase in the number of implanted cardiac electronic devices (CEDs) results in a higher rate of potential complications. One of such complications is cardiac device-related infective endocarditis (CDRIE), which usually requires device removal as the best therapeutic option.¹ The fluoro-deoxyglucose labeled with fluorine-18 (^{18}F -FDG) positron emission tomography (PET) coregistered with computed tomography (CT) is a well-established modality for the detection and localization of infection, and appears to be a useful additional tool for the diagnosis of CDRIE.¹ We present a case of a patient in whom the use of ^{18}F -FDG PET/CT helped differentiate between an infective endocarditis vegetation and a residual intracardiac mass after the removal of implantable cardioverter defibrillator (ICD).

A 79-year-old white woman with a history of stable coronary artery disease, myocardial infarction, and chronic heart failure presented at the Department of Cardiology with fever, dizziness, and progressive weakness for 2 preceding weeks. Transthoracic echocardiography revealed possible device-related vegetations in the right heart chamber, and transesophageal echocardiography (TEE) confirmed the presence of several mobile masses (the largest mass measuring 8 mm in diameter) related to a ventricular electrode (FIGURE 1A). Based on the clinical symptoms, echocardiographic images, and *Staphylococcus*

coagulase-negative sepsis confirmed by blood culture, the diagnosis of infective endocarditis was made. Empiric and then antibiogram-guided complex antibiotic therapies were introduced; however, the clinical condition of the patient worsened, the serum levels of inflammatory markers increased, and echocardiographic features of endocarditis were still present. Therefore, we decided to remove the device.

The removal procedure was complicated by a local hematoma requiring surgical drainage on the third day after the procedure. Postprocedural TEE revealed a new echogenic mobile mass (5 × 10 mm) on the tricuspid subvalvular apparatus (FIGURE 1B). Repeated blood, urinary, and extracted electrode cultures were negative. Despite continuous modified antibiotic therapy, the suspicious postremoval intracardiac mass persisted; therefore, we decided to perform ^{18}F -FDG PET/CT. An abnormal ^{18}F -FDG uptake was observed only in the device pocket and right inguinal area (FIGURE 1C and 1D). We hypothesized that the floating mass in the right ventricle could be a residual fibrous sheath that surrounded the ICD lead.

Residual masses are not a well-known complication of cardiac device removal. Stokes et al² suggested that encapsulation of cardiac device leads is an outcome of thrombosis due to endothelial damage and blood flow perturbation. The organization

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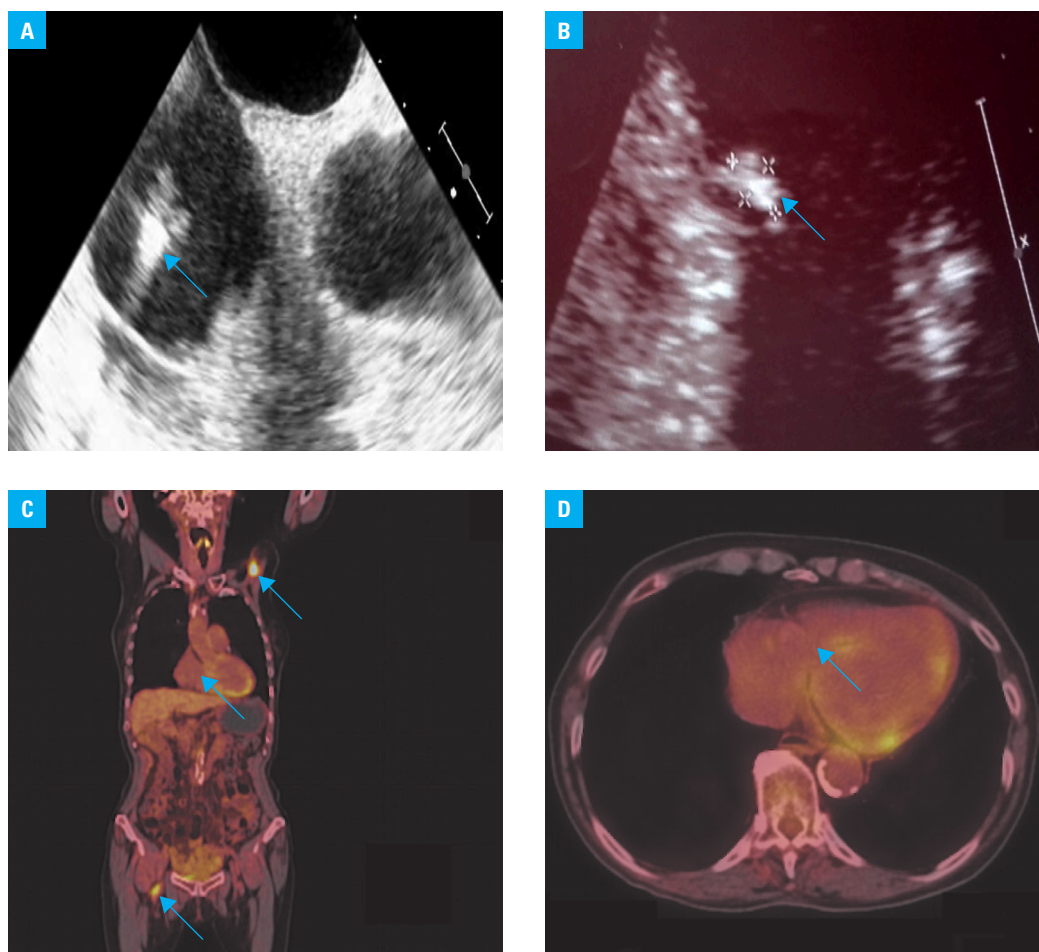


FIGURE 1 **A** – transesophageal echocardiography revealing mobile masses related to a ventricular electrode (arrow); **B** – transthoracic echocardiography revealing a new mobile echogenic mass (5 × 10 mm) on the tricuspid valve (arrow); **C, D** – positron emission tomography/computed tomography showing abnormal ^{18}F -FDG uptake in the device pocket and right inguinal area (arrows)

of a thrombus results in a vascularized collagenous capsule surrounding the leads.² Le Dolley et al³ described the presence of postremoval intracardiac masses as “ghosts” of the infected leads in 17 of 212 studied patients (8%) after device extraction for any reason. All of them had either CDRIE or local device infection, so the authors suggested that the “ghosts” might have been fibrous sheaths mixed with vegetations.

Several studies confirmed the usefulness of ^{18}F -FDG PET/CT in the diagnosis of CRDIE.⁴ Its sensitivity and specificity for detecting CDRIE was reported at 87.5% and 100%, respectively.⁵ Therefore, we decided to perform ^{18}F -FDG PET/CT, which confirmed the noninfectious nature of the postremoval intracardiac remnant mass.⁵ To the best of our knowledge, this is the first report confirming the usefulness of ^{18}F -FDG PET/CT in a differential diagnosis of active infective endocarditis and noninfectious residual masses after device extraction.

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