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Multimodal imaging in the diagnosis of infective endocarditis complicated with embolic acute myocardial infarction

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INTRODUCTION

Infective endocarditis (IE) is a clinical entity that is often accompanied with many complications, which must be diagnosed and treated quickly to reduce mortality.[1] We describe the role of multimodal imaging in the diagnosis of an IE complicated with a left ventricular embolic myocardial infarction (MI).

CLINICAL HISTORY

An 83-year-old man with history of arterial hypertension, type-2 diabetes mellitus, a bioprosthetic aortic valve and a saphenous vein bypass graft to the left anterior descending coronary artery in 2012, presented with a 24-hour history of fever.

Pertinent findings included fever, an aortic ejection murmur, pancytopenia and hyperglycemia. The electrocardiogram showed sinus rhythm and non-specific ST and T wave changes (Figure 1). Due to the suspicion of a possible IE, a transthoracic echocardiography was performed and did not show vegetations. The blood cultures were negative. A whole body computed tomography (CT) scan did not show remarkable positive findings at that time. He had persistently negative serial blood cultures but positive IgM and IgG serologies for Bartonella henselae.

A ^{18}F-fluorodeoxyglucose (^{18}F-FDG) PET/CT scan was performed after a 48-hour low-carbohydrate diet and the administration of a heparin bolus (50 IU/kg) 15 minutes before ^{18}F-FDG injection. The PET revealed a focal peri-prosthetic uptake in the aortic valve with a maximum standardized uptake value (SUV_{max} = 8 g/ml) and a myocardial uptake at the apex (SUV_{max} = 8.3 g/ml), which in the CT scan was suggestive of myocardial infarction (MI). The FGD uptake in the that area, suggests viable but ischemic myocardium likely representing stunning or hibernation (Figures 2, 3, and 4).

A repeat 2-dimensional echocardiogram was performed showing akinesia of the apex, not present in in the earlier study. A cardiac MRI was performed which showed a thinned and akinetic apex with late subendocardial gadolinium enhancement > 50% of thickness with an aneurysmal dilatation of the apex of the left ventricle in systole, suggestive of MI (Figure 5).

The patient was treated with Doxycycline and Rifampicin and happily recovered and released from the hospital.

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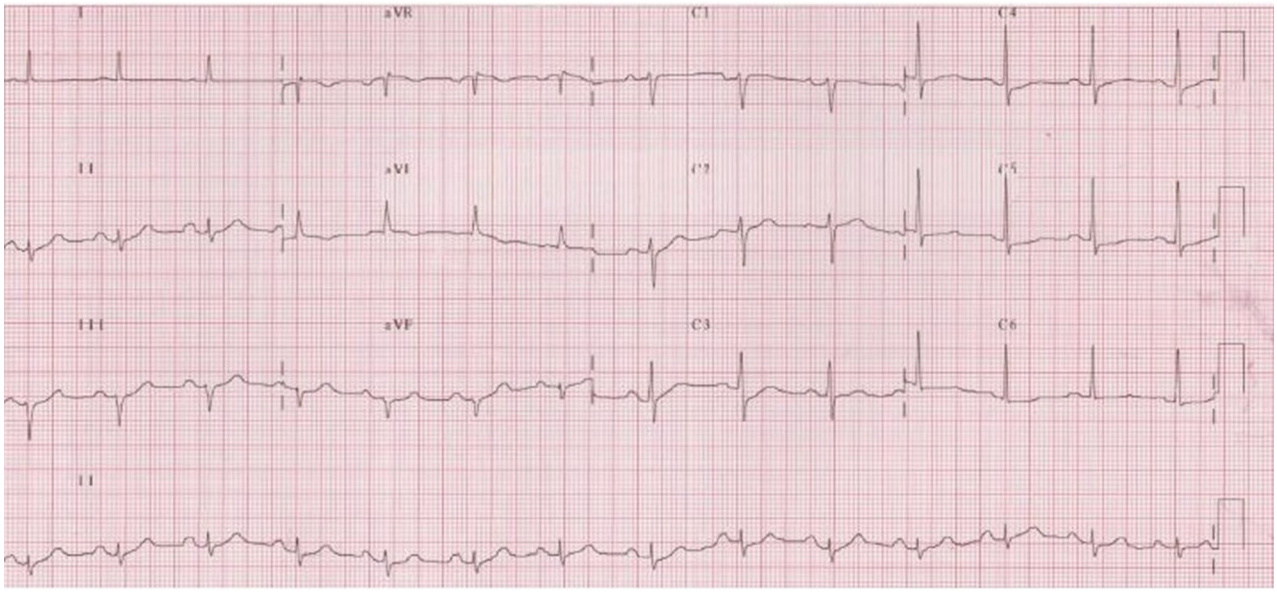

Figure 1. The electrocardiogram showed sinus rhythm and non-specific ST and T wave changes.

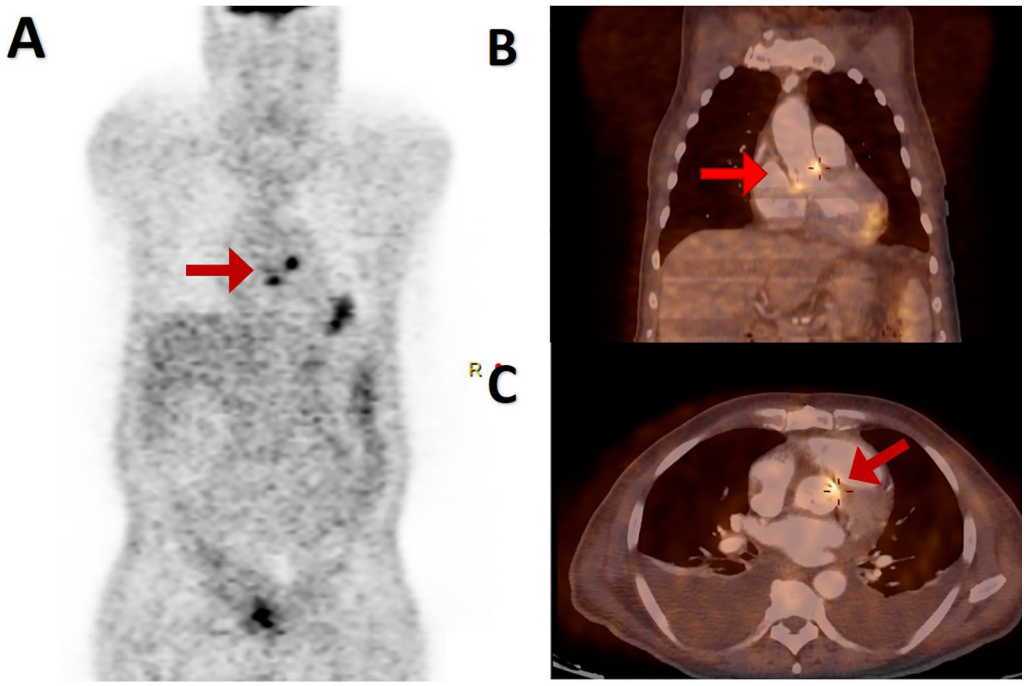

Figure 2. Multimodal image: (**A**) 18F-FDG PET images. (**B**) Coronal PET-CT image. (**C**) transaxial PET/CT image. The images revealed a focal peri-prosthetic uptake in the aortic valve (Red arrow) with a maximum standardized uptake value (SUV_{max} = 8 g/ml), suggestive of an infective endocarditis.

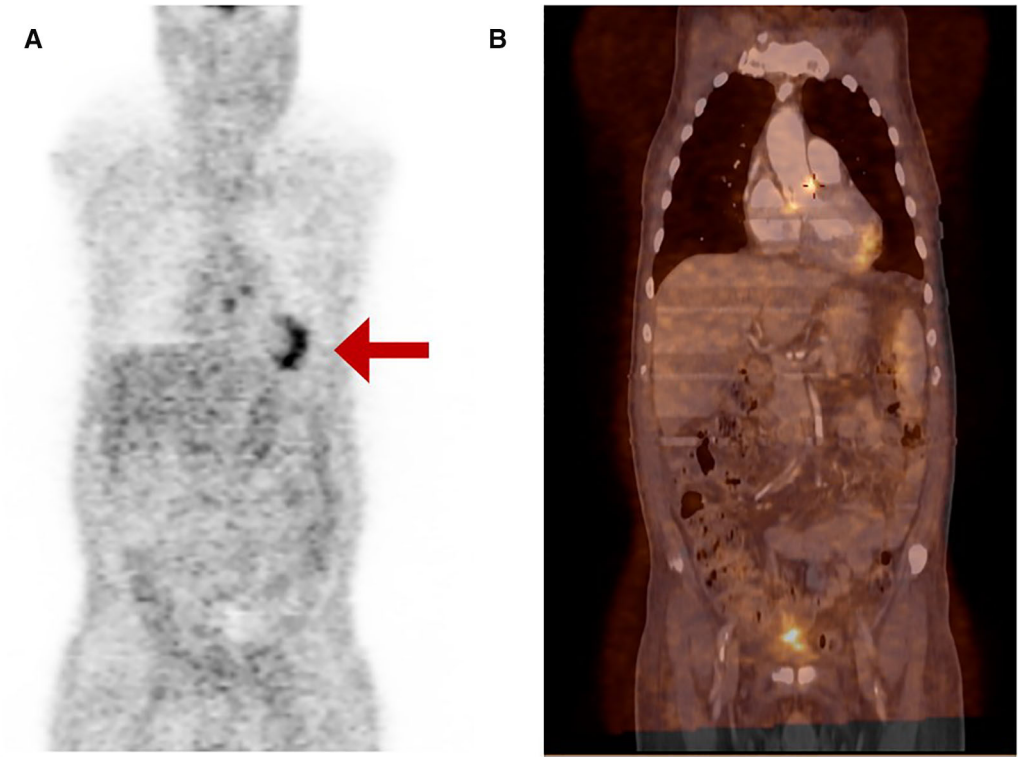

Figure 3. (**A**) 18F-FDG PET images. (**B**) PET-CT images. CT scan showed a subendocardial hypodense lesion affecting circumferentially the entire apical cap of the left ventricle, associated with dilatation of the tip that suggests a certain degree of ventricular remodeling, all suggestive of myocardial infarction, which in PET study was represented with increased uptake in the apex (SUV_{max} = 8.3 g/ml) (Red arrow).

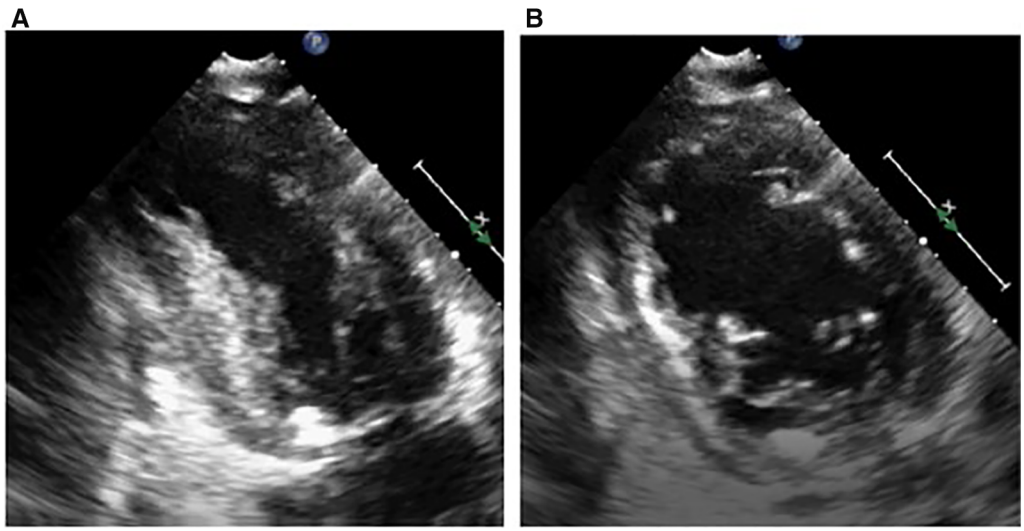

Figure 4. Transthoracic echocardiography images (**A**) Systole and (**B**) Diastole, showed hypokinesia of the apex.

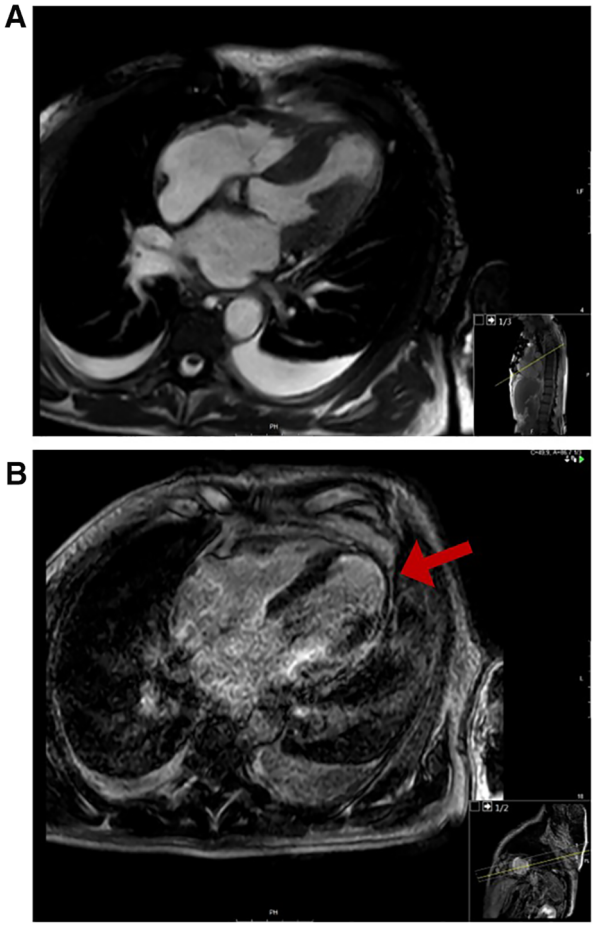

Figure 5. Cardiac MRI (**A**) after gadolinium administration (**B**). MRI images show a thinned and akinetic apex with late subendocardial gadolinium enhancement > 50% of thickness with an aneurysmal dilatation of the apex of the left ventricle (LV) in systole, suggestive of necrosis (Red arrow).

DISCUSSION

This clinical case highlights the role of ^{18}F-FDG PET/CT in the diagnosis of IE complicated by an embolic MI.[2,3] PET/CT should be considered in patients suspected of having IE, especially prosthetic IE that could not be confirmed by echocardiography. It not only helps in the diagnosis but also remote embolic complication, which in this case resulted in MI. The FGD uptake in the that area, suggests viable but ischemic myocardium likely representing stunning or hibernation

TEACHING POINTS

1. IE can be deadly if not managed early, therefore, this medical challenge should be managed by a multidisciplinary team familiarized in the diagnosis and treatment of this disease and its possible complications.
2. Frequently, IE causes many complications, such as an embolic MI or septic skeletal involvement that may present with continued fever. Echocardiography should initially be used but if not helpful, PET/CT should be considered.

FEATURE RESULTS

There were 48 responses of which 17 (35%) were correct/near correct.

By draw, the winner is:

Rodrigo Cardenas-Perilla, MD from Centro Medico Imbanaco, Colombia. Dr. Cardenas-Perilla's interpretation was ''Aortic valve endocarditis''.

Other (incorrect) responses included: Sarcoid, amyloid, lymphoma, myocarditis, hypertrophic cardiomyopathy, TAVR, thrombus, metal prosthesis, calcification, colon cancer and artifacts. Sarcoid was the answer by many!

Disclosure

The authors declare that they have no conflicts of interest.

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