18F-FDG-PET/CT in diagnosis of Q fever endocarditis

Célia Marques Domingues, MD,[a] Maria João Ferreira, MD, PhD,[a,b,c] Rodolfo Silva, MD,[c,d] Valdirene Gonçalves, MD,[a] António Marinho Silva, MD,[e] and Lino Gonçalves, MD, PhD[a,b]

[a] Department of Cardiology, Centro Hospitalar e Universitario de Coimbra EPE, Coimbra, Portugal
[b] Faculdade de Medicina, Universidade de Coimbra, Coimbra, Portugal
[c] Instituto de Ciências Nucleares Aplicadas à Saúde (ICNAS), Universidade de Coimbra, Coimbra, Portugal
[d] Department of Nuclear Medicine, Centro Hospitalar e Universitario de Coimbra EPE, Coimbra, Portugal
[e] Department of Pediatric Cardiology, Centro Hospitalar e Universitario de Coimbra EPE, Coimbra, Portugal

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INTRODUCTION

18F-fluoro-deoxy-glucose positron emission tomography (18F-FDG-PET/CT) is a tool recently used on diagnosis of valve prosthesis endocarditis,[1] useful when there are no echocardiographic signs of infectious endocarditis (IE), especially on high- risk patients.[2] 18F-FDG-PET/CT could be used in the screening of infection outbreaks on patients with previously diagnosed chronic Q Fever.[3]

CASE SUMMARY

45-year-old man with a history of congenital heart disease(double outlet right ventricle) submitted to several procedures: implantation of a homograph pulmonary valve; mechanical aortic valve substitution; and percutaneous pulmonary valve implantation(PPVI). Last open-heart surgery was 7 years ago.

Seven months after PPVI, patient presented with fever, fatigue, and anorexia of 10-days duration, **he has *no signs of heart failure and presents aortic valvular click with systolic murmur II/VI, like previously*. *The ECG presents sinuous heart rhythm, RBBB, and LAFB*** (Figure 1A)***, chest X-ray with no signs of pneumonia or heart failure*** (Figure 1B).Transthoracic and transesophageal echocardiographic studies showed no signs of endocarditis or valvular dysfunction (Figure 2).Laboratory results were notable for normocytic anemia (Hemoglobin 9.4 g/dl (reference rage: 13-15 g/dl) with mean corpuscular volume 90.4 fL (reference range 83-101 fL) and increased C-reactive-protein level 3.58 mg/dl(reference rage < 0.5 mg/dl). He had

Reprint requests: Célia Marques Domingues, MD, Department of Cardiology, Centro Hospitalar e Universitario de Coimbra EPE, Coimbra, Portugal; *celiadomingues@me.com*
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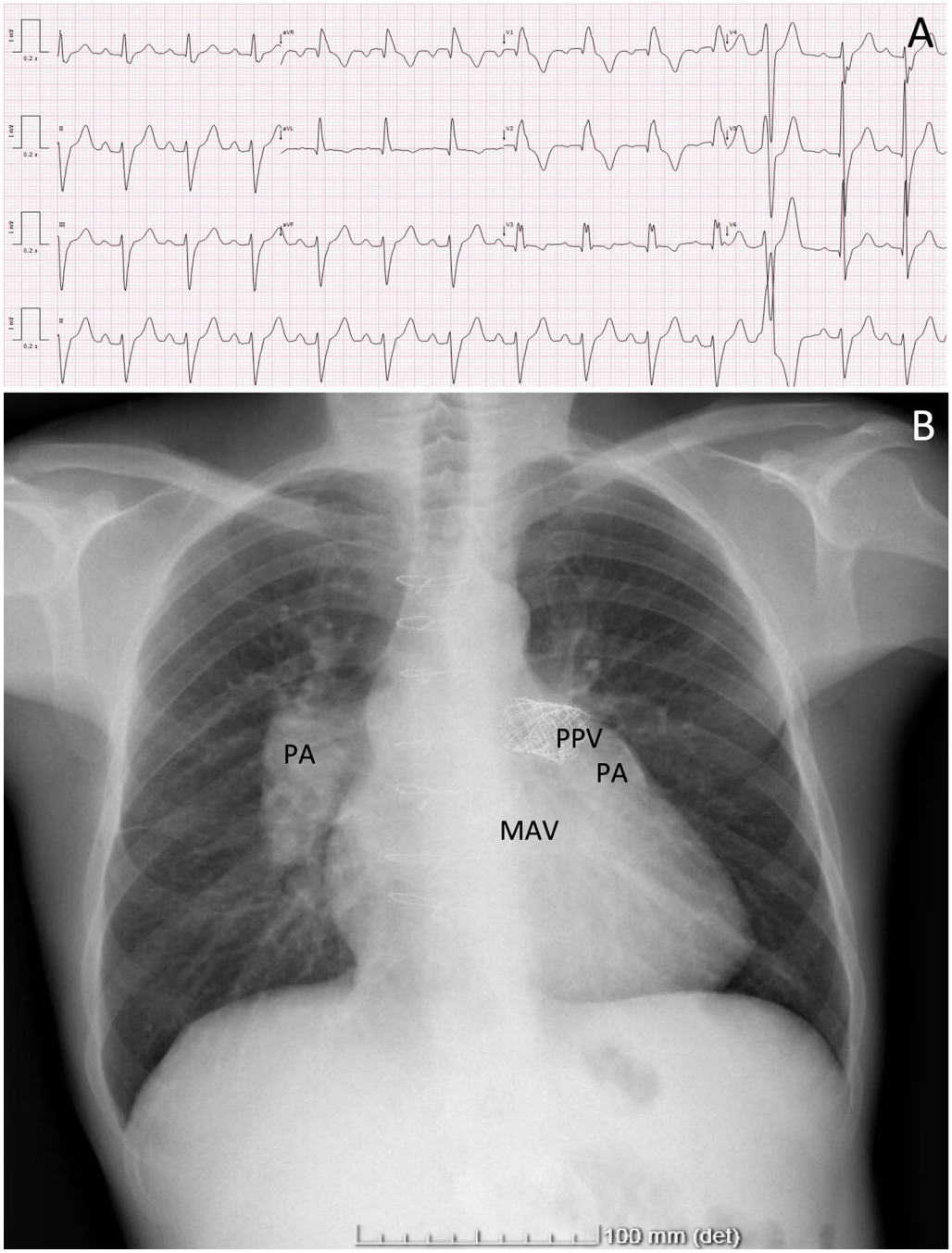

Figure 1. **A** Presents ECG with sinuous rhythm at 81 cpm, right blockage bundle branch (RBBB), left anterior fascicular blockage (LAFB), QRS duration of 152 ms, with one isolated premature ventricular complex (PVC). **B** An anteroposterior chest X-ray, with cardiac index of 55%, with no signs of heart failure or pneumonia and woo clearly identified percutaneous pulmonary valve (PPV), mechanical aortic valve (MAV) and dilated central pulmonary artery (PA) bilaterally.

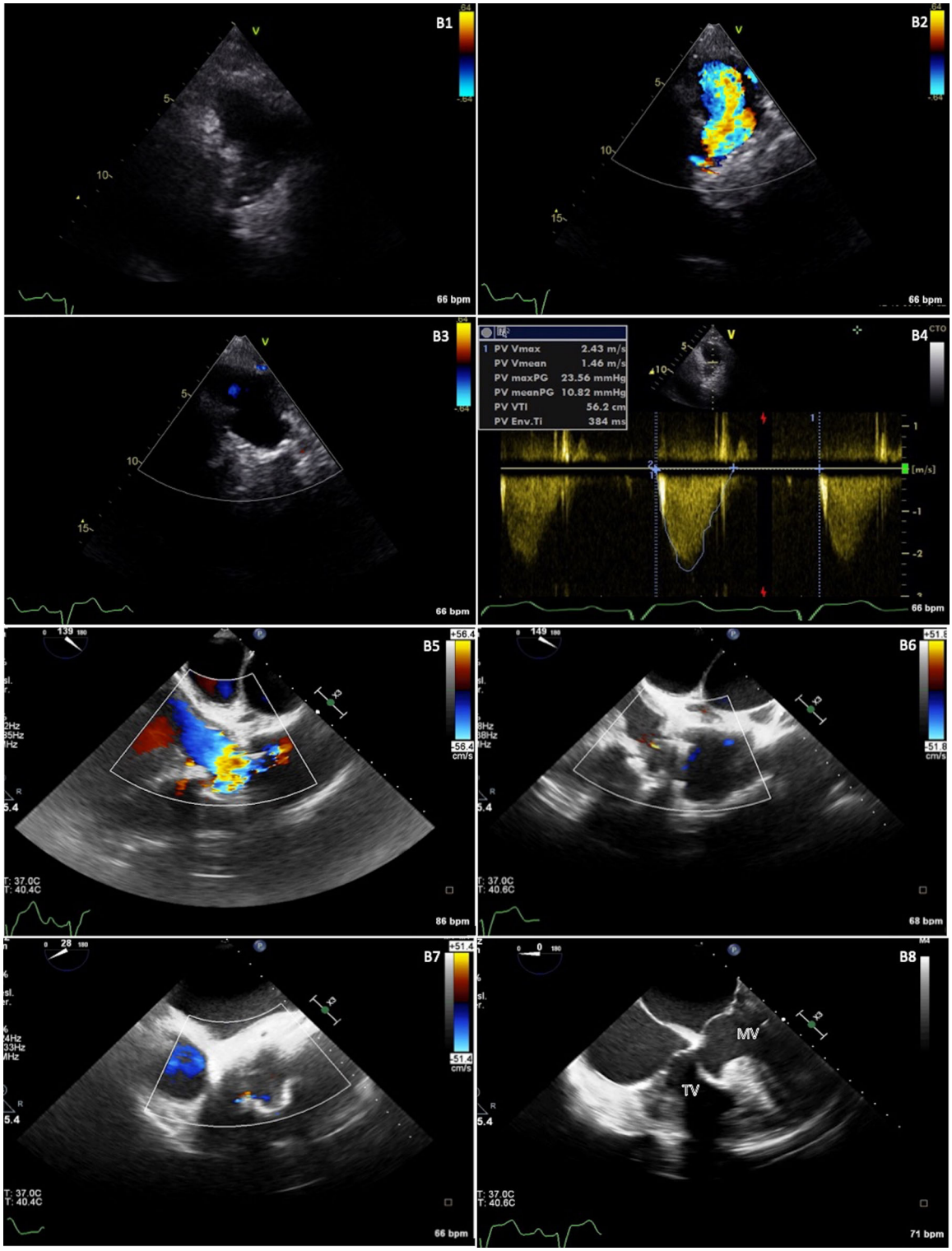

Figure 2. Presents transthoracic echocardiography view of percutaneous pulmonary valve on **B1** (set), without signs of vegetations and normal function, with normal flow on systole (**B2**), just with mild periprosthetic regurgitation on left side of valve, and just a mild regurgitation too through this leak on systole, like was previous(**B3**) and normal continuous doppler with maximal peak of 2,43 m/s. **B4**–**B8** presents images from transesophageal echocardiography at mechanical aortic view, woo shows normal systolic flow (**B5**), with just mild transvalvular regurgitation identified on A3C view (**B6**) and axial view (**B7**), and no signs of unequivocal endocarditis. At **B8** shows normal morphology, thickness and closure of tricuspid and mitral valve.

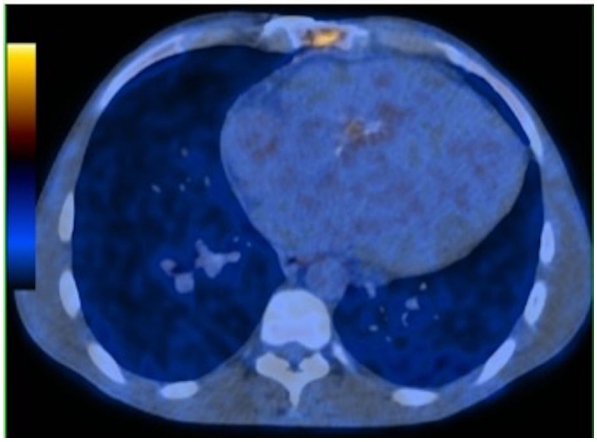

Figure 3. Maximum intensity projection of 18F fluorodeoxyglucose positron emission tomography (18F-FDG-PET) and fusion with computed tomography(PET-CT), on axial view at level of sternum. 18F-FDG-PET (up) revealed maximal FDG uptake with maxSUV:3,8 on sternum, location confirmed on PET/CT fusion images (down). This FDG uptake was present in all sternum bone.

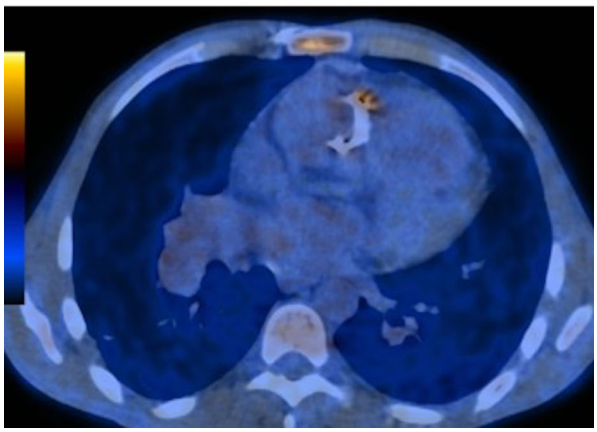

Figure 4. Maximum intensity projection of 18F-FDG-PET and PET-CT, on axial view at level of mechanic aortic valve. 18F-FDG-PET (up) revealed maximal FDG uptake with maxSUV:3 surround of mechanic aortic valve, location confirmed on PET/CT fusion images (down). All images keep FDG uptake on sternum.

four negative blood cultures. Patient had two previous admissions, with undiagnosed fever.

Considering patient's risk for endocarditis, 18F-FDG-PET/CT was performed, and showed high 18F-FDG uptake, maximum on sternum, max SUV:3.8 (Figure 3) and high uptake around prosthetic valves: aortic valve, max SUV:3 (Figure 4) and max SUV:2.4 at PPVI (Figure 5), compared with a max SUV:1.2-1.5 on superior and inferior vena cava. No other focuses of inflammation were found (Figure 6). These findings raised the concern of *Coxiella-burnetii* (Q Fever) infection, with cardiac valves and bone involvement confirmed subsequently by serologic tests in local and national infectious reference labs. Doxycycline and hydroxychloroquine treatment were initiated with improvement of anemia and constitutional symptoms. No valvular dysfunction was apparent after 3 months of therapy.

This case highlights that an abnormal 18F-FDG-PET-CT *activity around prosthetic valve detected on PET/MSCT is a ''major criterion'' of IE*, especially in *rare endocarditis etiologies such as Q Fever. Also, it is useful for follow-up and evaluation of therapeutic response in these cases.*

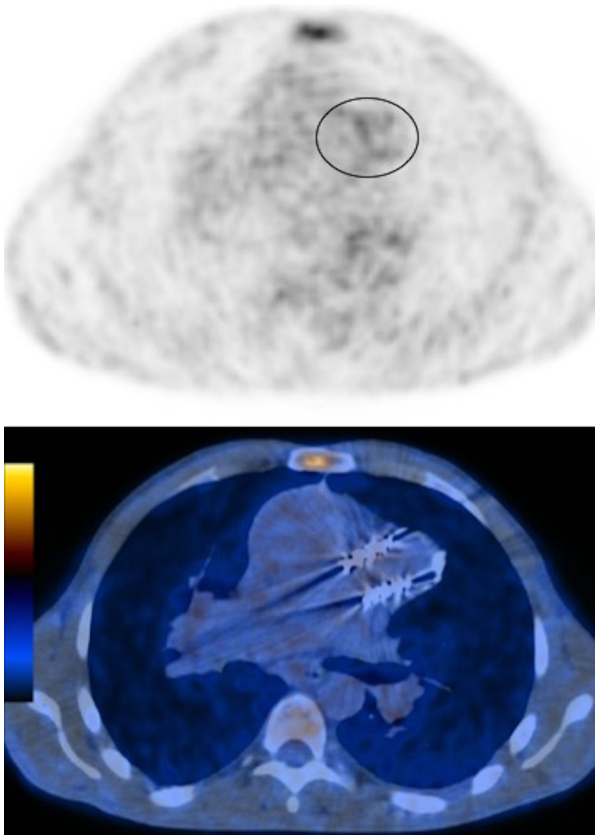

Figure 5. Maximum intensity projection of 18F-FDG-PET and PET-CT, on axial view at level of percutaneous pulmonary valve (PPV). 18F-FDG-PET (up) revealed maximal FDG uptake with maxSUV:2,4 on PPV (with circle), location confirmed on PET/CT fusion images (down). All images keep FDG uptake on sternum.

Figure 6. Whole body 18F-FDG-PET coronal image, with all pathological and physiological uptake foci. This presents marked FDG uptake on sternum, with important difference compared with other bones. No other suspected outbreak of infection was found on this coronal view.

Disclosure

The authors have no relevant disclosures.

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