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JCIMCR OPEN ACCESS Journal of Clinical Images and Medical Case Reports

ISSN 2766-7820

Clinical Image

Open Access, Volume 5

Incidental visualization of right ventricle on F-18 FDG PET/CT as an early indicator of heart failure

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Received: Mar 20, 2024
Accepted: Apr 18, 2024
Published: Apr 25, 2024
Archived: www.jcimcr.org

DOI: www.doi.org/10.52768/2766-7820/3009

Abstract

A 55 year hypertensive man presented with shortness of breath, productive cough and loss of weight. To rule out underlying malignancy, he underwent F-18 FDG PET/CT which showed bronchiectatic changes and tree-in bud nodules in bilateral lung fields with no definitive of evidence of metabolically active disease to suggest malignancy. There was no organomegaly and pulmonary to aorta ratio was also normal (0.73). However, diffuse FDG uptake was seen in the right ventricle which is uncommon due to less muscular mass in comparison to the left ventricle. The serum NT- pro BNP was raised to 265 pg/ml (upper limit less than 125 pg/ml) confirming heart failure.

Keywords: F-18 FDG; Right ventricle; heart failure; pro-BNP.

Abbreviations: F-18 FDG: F-18 2 Fluoro 2-D Deoxy Glucose; PET/CT: Positron Emission Tomography; NT-pro BNP: N-terminal pro B-type Natriuretic Peptide.

Description

Fatty acids are the main substrate for energy production in a normal-functioning heart, followed by glucose and ketones [1]. Myocardial FDG uptake is an indirect marker of myocardial glucose metabolism. In non-malignant conditions visualization of right ventricle on F-18 FDG PET/CT is reported in right heart failure or overload and inflammatory myopathies such as sarcoidosis and arrhythmogenic right ventricular cardiomyopathy [2,5]. Higher FDG uptake is associated with poor prognosis in idiopathic pulmonary hypertension [2]. In our case there was incidental right ventricular uptake with raised serum NT pro BNP suggestive cardiac failure. There was no other associated imaging features like pulmonary artery hypertension, Hepatomegaly, Cardiomegaly or pleural effusion. The likely cause of the right heart failure was diffuse parenchymal lung disease. To conclude, visualization of right ventricle on F-18 FDG PET/CT is an early sign of heart failure and further evaluation should be done to correct its cause.

Declarations

Acknowledgements: None.

Authors' contribution: DD conceived the idea of manuscript and wrote the first draft. AM and PR compiled the PET/CT images and SS helped in taking the clinical history of the patient. RK edited the manuscript and made the final draft of the manuscript.

Conflict of interest: The authors declare that they have no conflict of interest.

Funding and support: No funding was received to assist with the preparation of this manuscript. The authors have no relevant financial or non-financial interests to disclose.

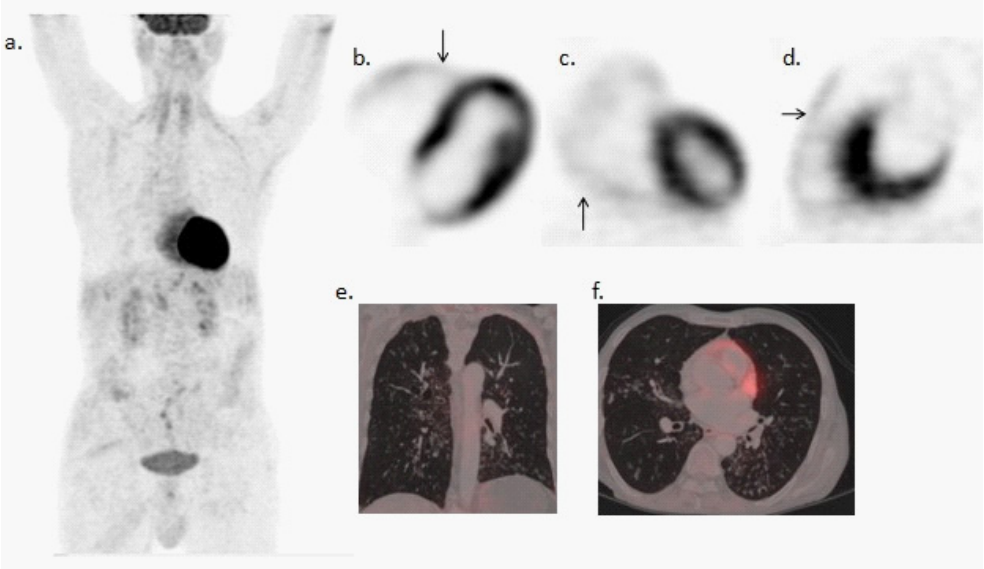

Figure 1: F-18 FDG PET/CT; MIP image **(a)**; Fused images **(b-d)** showing diffuse FDG uptake in right ventricle (arrows). Bronchiectatic changes and ground glassing in bilateral lung fields **(e-f)**.

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