



Sakir Akin
Corstiaan A. den Uil
Christine E. Groeninx van Zoelen
Diederik Gommers

PET-CT for detecting the undetected in the ICU

Received: 2 May 2015
Accepted: 12 May 2015
Published online: 8 July 2015
© The Author(s) 2015. This article is published with open access at Springerlink.com

S. Akin (✉) · C. A. den Uil · C. E. Groeninx van Zoelen · D. Gommers
Department of Intensive Care, Erasmus Medical Center,
Room H-626, 's-Gravendijkwal 230, 3015, CE, Rotterdam,
The Netherlands
e-mail: s.akin@erasmusmc.nl
Tel.: 0031642675027

Critically ill patients often have focuses of infection that are difficult to detect. When conventional imaging techniques fail to demonstrate the focus of infection, FDG-

PET-CT ($[^{18}\text{F}]$ fluorodeoxyglucose positron emission tomography combined with computed tomography) can be of value [1]. In this case, we present a 62-year-old male patient with a history of aplastic anemia. Two weeks following allogenic stem cell transplantation, he was admitted to the ICU and intubated because of respiratory failure by severe *Aspergillus* pneumonia. His recovery was complicated by persistent positive blood cultures with *Enterococcus faecium*, *Staphylococcus epidermidis* (CNS), and *Escherichia coli*. No focus could be found despite extensive investigations, including echography of great vessels and transesophageal echocardiography (TEE). After 2 weeks, we performed a PET-CT and found increased activity of fluorodeoxyglucose accumulation at the right atrial appendage (RAA) (Fig. 1). Retrospectively, there was an oscillating structure in the right atrium visible on the stored TEE images that was initially not recognized. We had the working diagnosis of infected thrombus. Intensive antibiotic therapy (meropenem and

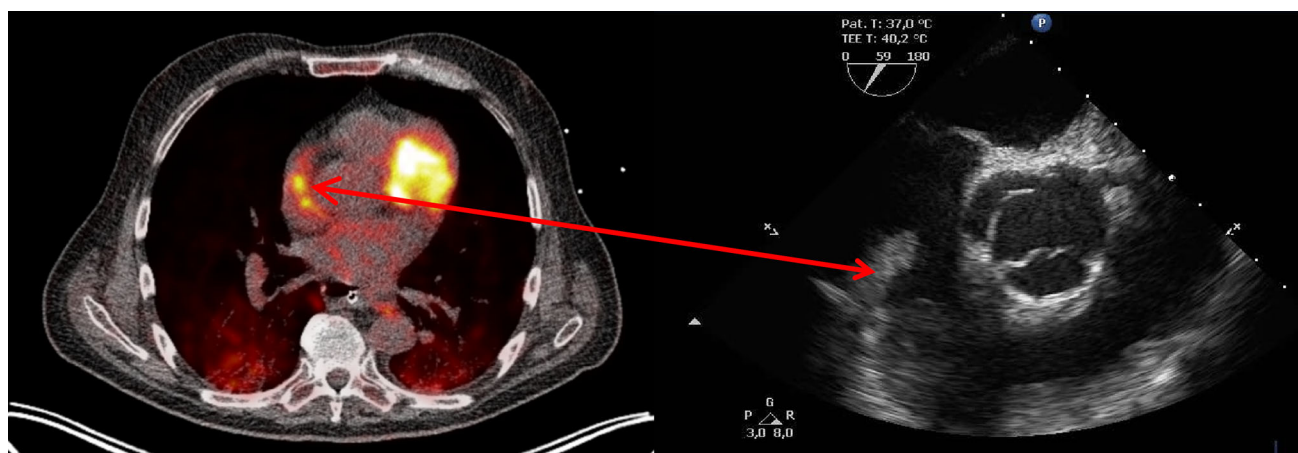


Fig. 1 a PET/CT images of positive uptake in the right atrial appendage (arrow) of an immunocompromised patient with persisting blood cultures for *E. faecium*, *S. epidermidis* (CNS)

and *E. coli*. b Corresponding TEE picture (aortic valve, short axis, right ventricular inflow/outflow)

vancomycin) was continued for 6 weeks combined with therapeutic dosages of unfractionated heparin (UFH), after which blood cultures became negative. During repeat TEE after 12 weeks the RAA thrombus had considerably reduced. After weaning from ventilation, the patient was discharged from ICU after 15 weeks in a reasonable condition.

In conclusion, the use of the FDG-PET-CT should be considered in ICU patients for detection of a focus during unexplained positive blood cultures. The PET scan should be organized in ICU ensuring discontinuation of glucose or insulin-containing intravenous infusions (for at least 6 h) and injection of intravenous radiolabeled FDG in the

scan room 1 h before starting the examinations, thereby allowing the patient to return to the ICU within 3 h.

Conflicts of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Open Access This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

Reference

1. Simons KS, Pickkers P, Bleeker-Rovers CP, Oyen WJ, van der Hoeven JG (2010) F-18-fluorodeoxyglucose positron emission tomography combined with CT in critically ill patients with suspected infection. *Intensive Care Med* 36:504–511