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PET-CT for detecting the undetected in the ICU

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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

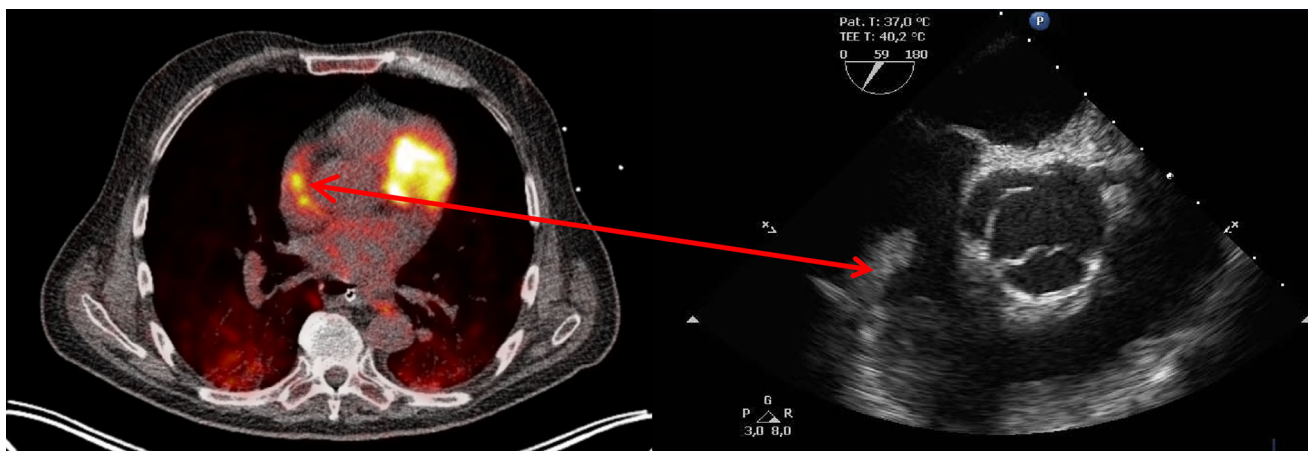


Fig. 1 **a** PET/CT images of positive uptake in the right atrial appendage (arrow) of an immunocompromised patient with persisting blood cultures for *E. faecium*, *S. epidermidis* (CNS) and *E. coli*. **b** Corresponding TEE picture (aortic valve, short axis, right ventricular inflow/outflow)

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.

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