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IMAGING IN INTENSIVE CARE MEDICINE

^{18}F-fluorodeoxyglucose positron emission tomography/computed tomography differentiates between pneumonia and atelectasis in a mechanically ventilated patient

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Differentiation between atelectasis and pneumonia in critically-ill patients can be challenging on regular computed tomography (CT). In this image the additional value of a ^{18}F-fluorodeoxyglucose positron emission tomography/computed tomography ([^{18}F]FDG PET/CT) scan to discriminate is demonstrated. This scan was requested to study dissemination of an infection in a 61-year-old male, who was admitted to the intensive care due to multiple organ failure. Figure 1 shows normal physiological uptake in the myocardium (pink arrow), bilateral pleural effusion (white arrow), atelectasis with slightly elevated [^{18}F]FDG uptake in the left lower lobe (orange arrow) and atelectasis with high [^{18}F]FDG uptake in the right lower lobe (green arrow). The high [^{18}F]FDG uptake is likely due to an infectious focus. This was confirmed by a subsequent positive sputum culture positive for Serratia marcescens, which confirmed the diagnosis of a ventilator associated pneumonia.

The low-level [^{18}F]FDG uptake noticed in atelectasis is associated with low grade inflammation and not with increased tissue density of the lung. The intensive [^{18}F]FDG uptake in the right lower lobe of the lung indicates a much larger local inflammatory response most likely caused by an infection. Ultimately, this image emphasizes the potential of [^{18}F]FDG PET/CT to differentiate between infectious and inflammatory pulmonary abnormalities in critically ill patients.

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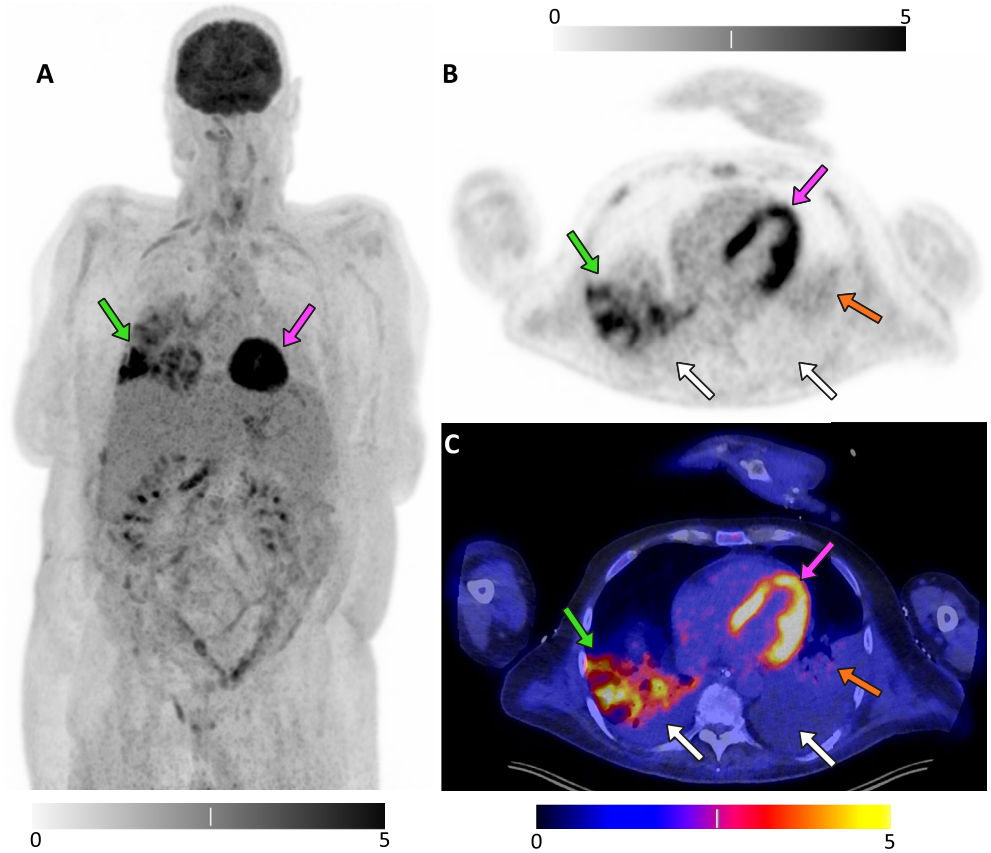

Fig. 1 **A** Maximum Intensity Projection. **B** Transversal [^{18}F]FDG PET image. **C** Transversal fusion image of [^{18}F]FDG PET/CT. $\alpha = 0.5$. Standardized Uptake Value scale from 0 to 5. Arrows: green: infection, orange: atelectasis, white: pleural effusion, pink: physiological myocardial uptake

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Data availability
The data used in this image is presented in the manuscript. Therfore, an additional data statement is not applicable.

Declarations

Conflicts of interest
None of the authors has any conflict of interest to declare.

Patient consent
Written informed consent was obtained from the patient.

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