



Added value of ^{18}F -FDG PET/CT in a SARS-CoV-2-infected complex case with persistent fever

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A 75-year-old diabetic man with a cardiac history of pacemaker implantation and mechanical prosthetic valve (PV) replacement, also known for chronic osteitis of the first left metatarsophalangeal joint (MTP I), was treated with oral antibiotic on an outpatient basis with poor compliance when he developed intermittent fever (39.8 °C) and left foot pain. Laboratory testing revealed a slight elevation of the white blood cell count (10.7 G/L) and a significant elevation of the C-reactive protein (235 mg/L). Hemocultures turned positive for multi-sensitive *Staphylococcus aureus* and *Proteus mirabilis*. A left foot CT showed MTP I osteoarthritis without collection. Transoesophageal echocardiography (TOE) showed no evidence of endocarditis. A double antibiotic regimen was started, but the patient developed persistent fever. Repeated TOE raised endocarditis suspicion. Because of a newly developed cough, a search for respiratory pathogens was performed and turned positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. An ^{18}F -FDG PET/CT was requested for investigating the suspicion of PV infection with a 72-h low-carbohydrate diet preparation.

The ^{18}F -FDG PET maximum-intensity projection image shows (a) bilateral metabolic lung lesions, the foot infection (*), and one metabolically active draining sentinel lymph node (arrowhead). (b) Free-breathing lung CT and ^{18}F -FDG with

hypermetabolic (SUV_{max} 7.6 g/mL) focal ground-glass opacities with partial consolidation and mild bronchial dilatation with a peripheral distribution in the subpleural and periscissural regions of the apical and posterior segments of both upper lobes and right middle lobe, as previously described on CT [1]. (c) Hypermetabolic lymphadenopathies in the right lower paratracheal, subcarinal, and bilateral hilar stations (SUV_{max} 6.1 g/mL). (d, e) Absence of active PV or PM case/lead infection and no sign of septic embolism. (f) ^{18}F -FDG PET/CT showing intense FDG accumulation in MTP I compatible with an active bone infection. (g) Comparison of ^{18}F -FDG activity in the lung ground-glass opacities vs. the mediastinal, hilar, and paratracheal lymph nodes.

This case illustrates the benefit of ^{18}F -FDG PET/CT in differential diagnosis of fever of multiple possible origins in the setting of SARS-CoV-2 infection [2]. In accordance with previous retrospective observations [3, 4], we confirmed the characteristic pattern of SARS-CoV-2 viral infection on ^{18}F -FDG PET/CT with intense ^{18}F -FDG uptake of pulmonary lesions, nodal involvement, and absence of other hypermetabolic lesions [3]. To the best of our knowledge, this is the first prospective case showing the feasibility of ^{18}F -FDG PET/CT in patients with confirmed SARS-CoV-2 infection when taking adequate protective measures [5].

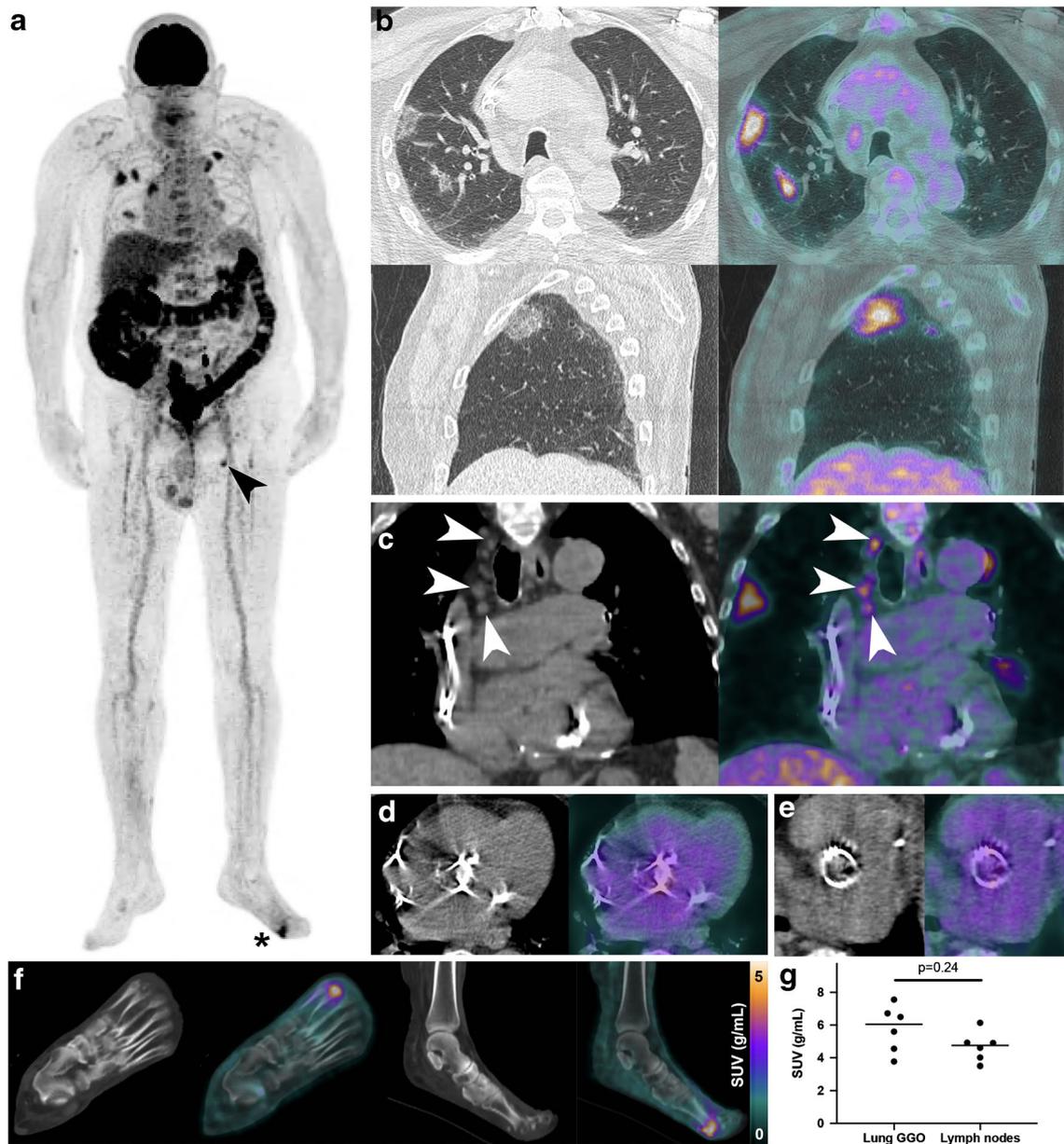
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Compliance with ethical standards

The procedure followed was in accordance with the ethical standard guidelines of the institution and with the provided consent of the patient. All authors have approved the case report and agree with its submission to the journal. There is no financial or other relation that could lead to a conflict of interest.

References

- Xu X, Yu C, Qu J, Zhang L, Jiang S, Huang D, et al. Imaging and clinical features of patients with 2019 novel coronavirus SARS-CoV-2. *Eur J Nucl Med Mol Imaging*. 2020. <https://doi.org/10.1007/s00259-020-04735-9>.
- Deng Y, Lei L, Chen Y, Zhang W. The potential added value of FDG PET/CT for COVID-19 pneumonia. *Eur J Nucl Med Mol Imaging*. 2020. <https://doi.org/10.1007/s00259-020-04767-1>.
- Qin C, Liu F, Yen TC, Lan X. ^{18}F -FDG PET/CT findings of COVID-19: a series of four highly suspected cases. *Eur J Nucl Med Mol Imaging*. 2020. <https://doi.org/10.1007/s00259-020-04734-w>.
- Zou S, Zhu X. FDG PET/CT of COVID-19. *Radiology*. 2020;200770. <https://doi.org/10.1148/radiol.2020200770>.
- Zhang X, Shao F, Lan X. Suggestions for safety and protection control in Department of Nuclear Medicine during the outbreak of COVID-19. *Eur J Nucl Med Mol Imaging*. 2020. <https://doi.org/10.1007/s00259-020-04779-x>.

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