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¹⁸F-Fluorodeoxyglucose Uptake in Patient With Asymptomatic Severe Acute Respiratory Syndrome Coronavirus 2 (Coronavirus Disease 2019) Referred to Positron Emission Tomography/Computed Tomography for NSCLC Restaging



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Case Report

This is a case of a 73-year-old male patient who underwent medium lobe resection for pT2aN0 NSCLC in April 2016, without administration of adjuvant therapies. During routine computed tomography (CT) scan performed in February 2020, a centimetric nodule in the left superior lobe, suspected of being malignant, was found. Functional imaging with ¹⁸F-fluorodeoxyglucose (¹⁸F-FDG) positron emission tomography (PET)/CT was requested by the tumor board to evaluate the nodule metabolism. ¹⁸F-FDG PET/CT was scheduled on March 18, 2020, 27 days after the outbreak of the severe acute respiratory syndrome coronavirus 2 in Italy. During the triage procedures required for prevention of the coronavirus disease 2019 (COVID-19), the patient's body temperature was less than 37.5°C, and he presented neither cough or wheezing nor shortness of breath. The patient declared no exposure to suspected infected people, and he was a nonsmoker with no cardiovascular comorbidities.

¹⁸F-FDG PET/CT result revealed the presence of bilateral, diffuse, and intense FDG uptake in the lower lobes (right lower lobe maximum standardized uptake value [SUV_{max}] = 5.9; left lower lobe SUV_{max} = 7.9; SUV_{mean} of the liver = 2.0) and less intense uptake in the remaining lobes. The FDG uptake corresponded to peripherally predominant ground-glass opacities observed in low-dose CT without contrast media administration (Figs. 1A–D and 2A–C). An increased uptake of ¹⁸F-FDG in the mediastinal lymph nodes was also observed (SUV_{max} =

5.6 in right lower paratracheal node) (Fig. 2D–F). No pleural effusion was noted. The solitary nodule in the left superior lobe did not reveal relevant ¹⁸F-FDG uptake.

The nuclear medicine team interpreted the PET scan results as active inflammatory processes with consensus, with a CT pattern highly suggestive of ongoing COVID-19 pneumonia, as reported in literature.^{1,2} After a consultation with COVID-19 taskforce authorities, the patient was tested with real-time reverse-transcriptase polymerase chain reaction that revealed a positive result, and he was subsequently quarantined. Nevertheless, hospitalization in an intensive care unit was necessary 3 days after the PET/CT scan owing to rapid disease progression and severe respiratory distress syndrome.

Discussion

At present, more than 80,000 people are affected by COVID-19 in Italy leading to COVID-19-related death in more than 7000 patients. PET scans are still offered to

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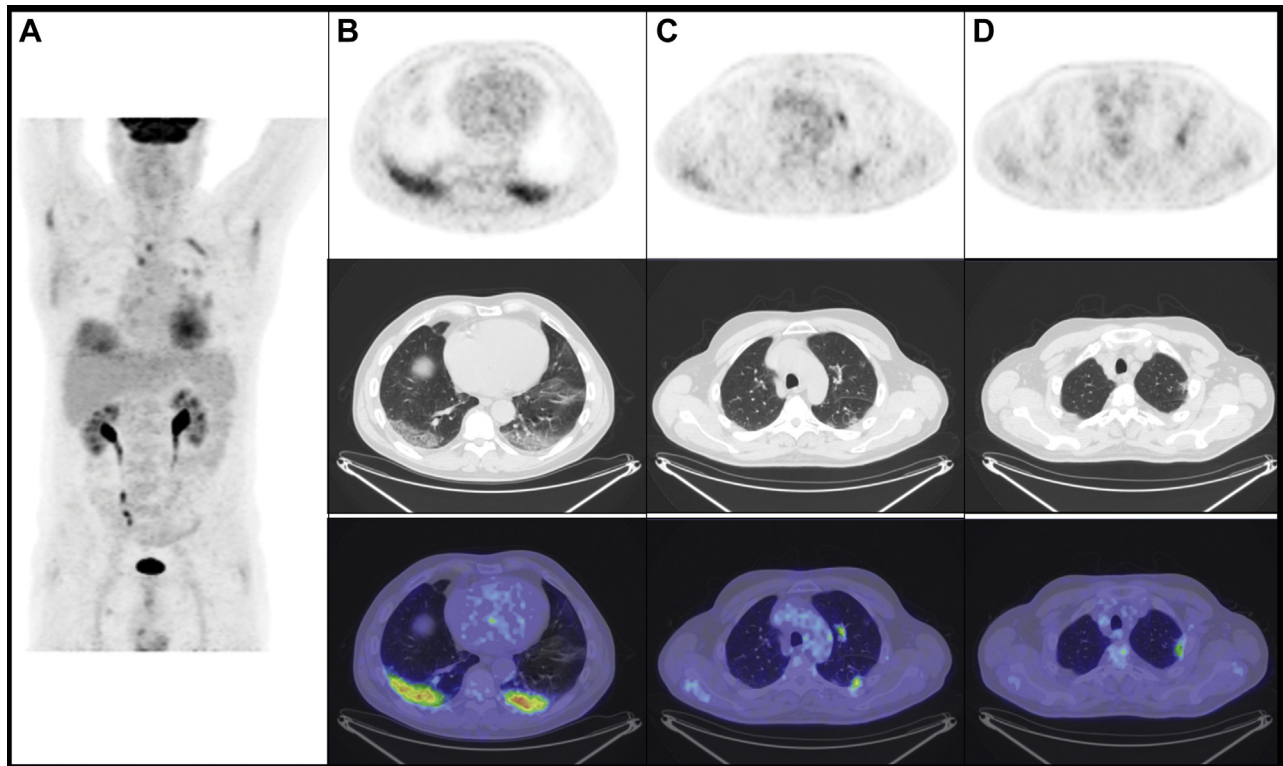


Figure 1. (A) Maximum intensity projection and (B, C, D) transaxial positron emission tomography, computed tomography, and fused positron emission tomography and computed tomography images of ¹⁸F-fluorodeoxyglucose uptake in the upper and lower lobes of the lungs.

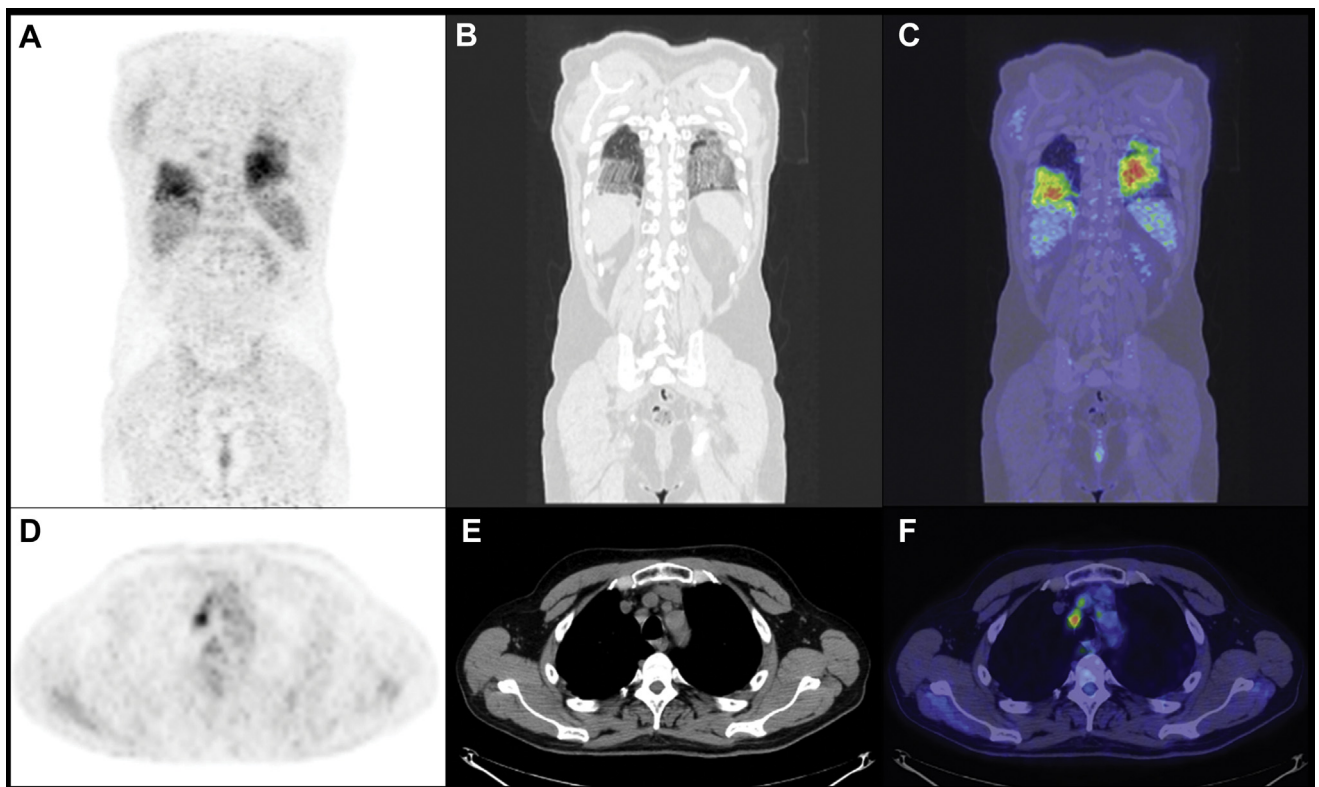


Figure 2. (A, B, C) Coronal and transaxial and (D, E, F) positron emission tomography, computed tomography, and fused positron emission tomography and computed tomography images of ¹⁸F-fluorodeoxyglucose uptake in the upper and lower lobes of the lungs and mediastinal lymph nodes.

patients with cancer to guarantee the continuation of best clinical practice, even in the scenario of national restrictive directives. Thus, the number of asymptomatic pathogen carriers in nuclear medicine facilities is not negligible. COVID-19 radiologic pattern (Rx and CT) has become known, usually described as peripherally predominant ground-glass opacities or lung consolidation involving mainly the lower lobes.³ Nevertheless, discrepancy between radiologic patterns and clinical symptoms is possible, and several studies have reported this clinical-radiologic dissociation.^{4,5} The few, currently available reports of ¹⁸F-FDG PET/CT in patients with COVID-19 describe, in all cases, symptomatic patients with common COVID-19 manifestations, including fever, cough, shortness of breath, myalgia, and fatigue.^{1,2} To the best of our knowledge, this is the first case report of an asymptomatic patient investigated with ¹⁸F-FDG PET/CT. This case highlights the rapid disease progression in an asymptomatic patient who presented FDG avid and COVID-19 pneumonia. Although there is no definitive evidence, asymptomatic patients who present typical radiologic CT patterns and positive FDG uptake should be promptly tested and strictly monitored because a sudden worsening of clinical conditions is possible.

Compliance with Ethical Standards

All procedures performed in studies involving human participants were in accordance with the ethical

standards of the institution and the national committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

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