Atypical Presentation of COVID-19 Incidentally Detected at ^{18}F-FDG PET/CT in an Asymptomatic Oncological Patient

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Abstract: The incidence of COVID-19, a severe acute respiratory syndrome caused by SARS-CoV-2, is rapidly growing worldwide. In this pandemic period, the chance of incidental pulmonary findings suggestive of COVID-19 at ^{18}F-FDG PET/CT in asymptomatic oncological patients is not negligible. To suspect COVID-19 is more demanding whether its presentation is atypical. We describe the incidental PET/CT detection of an ^{18}F-FDG–avid isolated centrilobular pulmonary consolidation in an asymptomatic lymphoma patient, which later resulted in an unexpected and atypical COVID-19 presentation. The nuclear medicine physicians should be prepared to suspect COVID-19 even in asymptomatic patients presenting with a "far-from-COVID-19" finding at PET/CT.

Key Words: ^{18}F-FDG, consolidation, COVID-19, PET/CT, pneumonia, SARS-CoV-2

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The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Written informed consent was obtained from the patient prior to imaging procedures.

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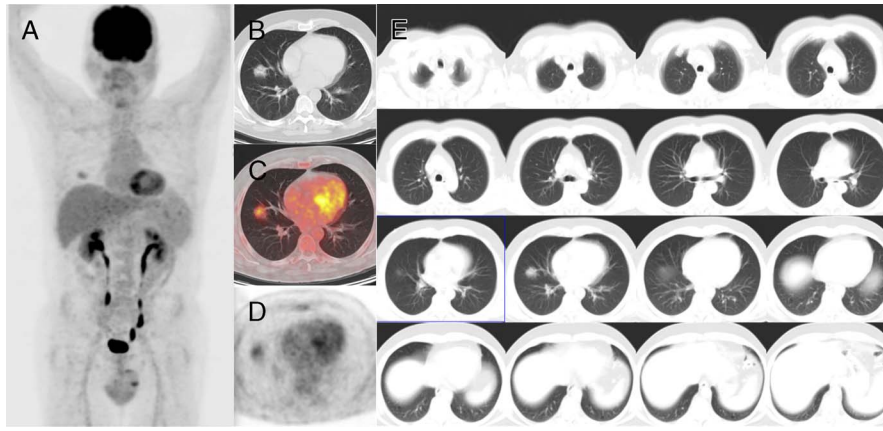

FIGURE 1. A 59-year-old man with diffuse large B-cell lymphoma on whom an ^{18}F-FDG PET/CT was performed for immunochemotherapy response evaluation on March 18, 2020, 27 days after COVID-19 outbreak in Italy. Along with partial metabolic response, PET maximum intensity projection image (**A**) revealed a focal uptake area in the middle field of the right lung, corresponding on axial images (**B**, low-dose free-breathing coregistered CT; **C**, fused PET/CT; **D**, PET only) to a metabolically active (SUVmax 3.3) isolated centrilobular consolidation in the middle lung lobe surrounded by a faint ground-glass opacity (GGO) (maximum diameter 28 mm), without any other parenchymal alterations detectable bilaterally at coregistered CT (**E**). At that time, the patient was considered at low risk of SARS-CoV-2,[1] being completely asymptomatic and denying suspected expositions to infected people. Based on clinical and morphofunctional characteristics, the PET/CT finding was interpreted as a nonspecific pneumonia at an early phase, as frequently occurring during chemotherapy. A subsequent clinical/radiological evaluation was suggested. On March 30, still asymptomatic without specific medication, the patient underwent a chest x-ray for revaluation, showing bilateral parenchymal consolidations, highly suggestive of viral pneumonia. He suddenly was tested for SARS-CoV-2 through nasopharyngeal swab, resulting as positive, and he was quarantined at home.

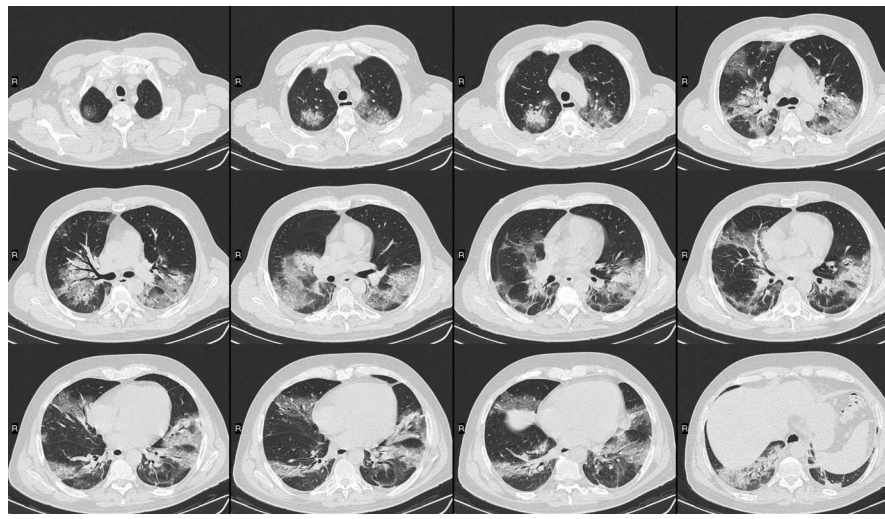

FIGURE 2. Soon after, the patient developed fever, cough, and intense dyspnea. On April 4, he went to a local accident and emergency department, where a chest CT was performed: axial images showed widespread multiple bilateral GGOs and consolidations with air bronchogram in both upper and lower lung fields with predominant peripheral distribution, concordant with typical bilateral COVID-19 pneumonia.[2,3] After several days of assisted ventilation with continuative positive airway pressure and multidrug treatment (including steroids, hydroxychloroquine, tocilizumab, levofloxacin, azithromycin, low-molecular-weight heparin, antiplatelet, lopinavir/ritonavir), patient's disease status improved. To the best of our knowledge, this is the first reported case of an atypical presentation of a confirmed COVID-19 pneumonia as unilateral isolated and relatively small ^{18}F-FDG–avid consolidation in an asymptomatic oncological patient incidentally detected at PET/CT. Growing literature reports on symptomatic and asymptomatic[4–18] oncological patients with incidental ^{18}F-FDG–avid pulmonary findings highly suggestive of COVID-19, although presenting with more common multiple bilateral GGOs and consolidations. Our case highlighted that atypical PET/CT presentation of COVID-19 in asymptomatic oncological patients, appearing as in our case, is the most challenging issue for nuclear medicine physicians. Indeed, oncological patients undergoing PET/CT may present with pulmonary malignancies (eg, lung cancer, lymphoma), but often copresenting pulmonary treatment-related inflammatory/infective processes (eg, nonspecific pneumonia). At PET/CT, these conditions could show similar morphofunctional appearance, but considered atypical for COVID-19. Therefore, in such unexpected COVID-19 case, to suspect the most likely diagnosis, although incorrect, is highly probable. Now more than ever, it is of paramount importance to avoid delay in COVID-19 diagnosis. Consequently, we should consider any new-onset pulmonary lesion as a possible COVID-19 manifestation, until proven otherwise. Therefore, a SARS-CoV-2 test may be considered even for an asymptomatic patient at low risk of SARS-CoV-2 infection and presenting with an apparently "far-from-COVID-19" finding at ^{18}F-FDG PET/CT, aiming to promptly reach a definitive diagnosis, reduce the viral spread, and early indicate appropriate therapeutic management.