^{18}F-FDG PET/CT in Hodgkin Lymphoma With Unsuspected COVID-19

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Abstract: We present an asymptomatic 70-year-old man referred for an ^{18}F-FDG PET/CT for initial staging of a Hodgkin lymphoma. ^{18}F-FDG PET/CT showed bilateral cervical lymphadenopathy (stage II). Incidentally, the CT demonstrated bilateral ground-glass opacities with low-grade ^{18}F-FDG activity. CT findings were suspicious for COVID-19 pneumonitis. The COVID-19 reverse transcriptase polymerase chain reaction (RT-PCR) examination result was negative. Given the high clinical suspicion for COVID-19, the patient was isolated and repeat RT-PCR was positive at 72 hours. RT-PCR may be falsely negative in early COVID-19 disease, even with positive CT findings.

Key Words: COVID-19, coronavirus, FDG PET/CT, RT-PCR, Hodgkin lymphoma

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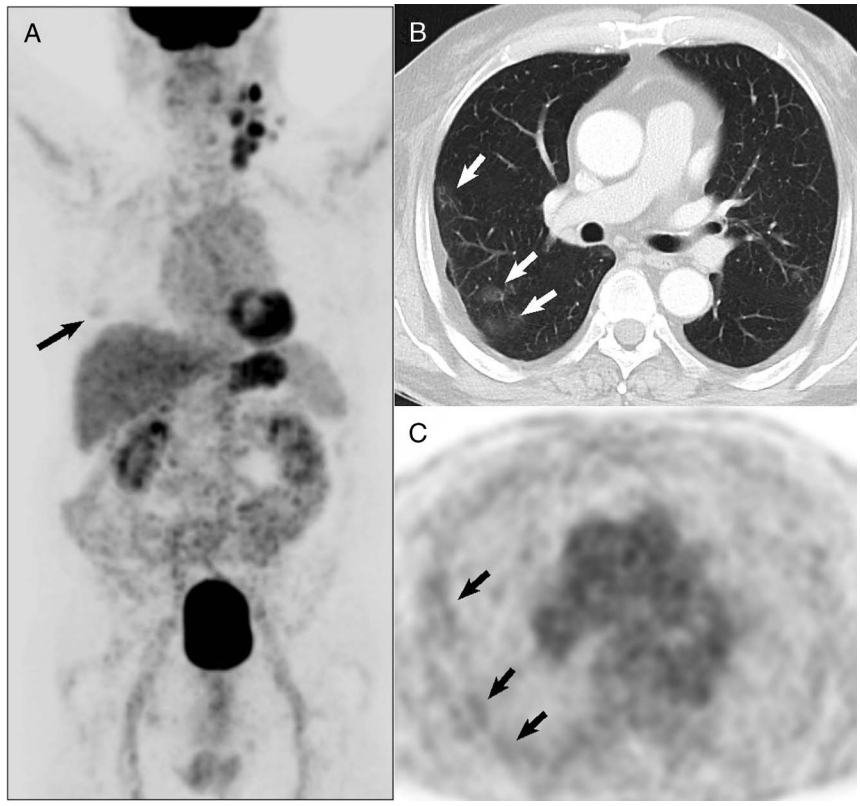

FIGURE 1. This 70-year-old asymptomatic man from La Rioja, Spain, underwent ^{18}F-FDG PET/CT for initial staging of Hodgkin lymphoma. His diagnostic workup included contrast-enhanced CT, followed by ^{18}F-FDG PET/CT, with both examinations reported together. He had no clinical evidence for COVID-19 infection including no known risk contacts. At the time of this writing, La Rioja region had one of Spain's highest COVID-19 incidence rates, with more than 1500 positive tests per 100,000 inhabitants, followed closely by Madrid with over 900 per 100,000 inhabitants.[1] ^{18}F-FDG PET/CT was performed following the European Association of Nuclear Medicine procedure guidelines.[2] MIP images (**A**) showed bilateral cervical lymphadenopathy with abnormal ^{18}F-FDG uptake, predominantly in the left side (SUV_{max}, 9.0). The right lower lung (arrow, **A**) had ill-defined low-grade activity (SUV_{max}, 2.4). On CT (**B**), there were bilateral tree-in-bud opacities and several peripheral and subpleural ground-glass opacities (GGO), predominantly in the right lung (arrows). These showed mild activity on axial PET (arrows, **C**). GGOs have been reported as a primary CT findings in COVID-19,[3,4] whereas pleural effusions and the tree-in-bud sign are atypical in COVID-19, possibly related to complications (pleural effusions) or superadded bacterial infection (tree-in-bud sign).[4,5] Although the patient was asymptomatic, with no fever or cough, his CT findings were suspicious for COVID-19. The same day as the PET/CT, a reverse transcriptase-polymerase chain reaction (RT-PCR) test had negative results for COVID-19 virus (also named "severe acute respiratory syndrome coronavirus 2" or SARS-CoV-2).[6] Same day chest radiography was negative, and blood tests showed normal lymphocytes (19.5%), D-dimer (<200 μg/L), and LDH (115 U/L). Microbiological studies were negative for pneumococcus, legionella, and respiratory viruses. Given the high clinical suspicion for COVID-19, the patient was immediately isolated, and a repeat RT-PCR at 72 hours was positive for COVID-19. Repeat laboratory tests showed high IL-6 (4.4 pg/mL) and ferritin (1433 ng/mL), with normal D-dimer (<200 μg/L), lymphocytes, and LDH (127). He was treated for COVID-19 with paracetamol and hydroxychloroquine sulphate (dolquine), plus omeprazole, enoxaparin, furosemide, azithromycin, and tranxilium. One week after diagnosis, the patient remained asymptomatic, with no respiratory impairment. Recent reports have focused on lung CT findings in COVID-19.[3,4,7] Four COVID-19 patients scanned with ^{18}F-FDG PET/CT showed increased ^{18}F-FDG activity in GGOs associated with COVID-19.[8] CT findings are not part of the diagnostic criteria for COVID-19, and CT should not be relied upon for the initial diagnosis. Currently, RT-PCR has a key role in determining patient hospitalization and isolation, although its sensitivity is imperfect, with potentially long processing times in many settings. In this scenario, CT findings have been used as a surrogate for early detection in suspicious cases. CT may also demonstrate disease evolution and treatment effects. In our patient with initial staging of Hodgkin lymphoma and asymptomatic lung infection, CT suggested the diagnosis of unsuspected COVID-19, preceding RT-PCR confirmation by several days. Low ^{18}F-FDG activity in his GGOs may represent relatively low disease virulence.