^{68}Ga-DOTANOC PET/CT With Lung Involvement in the Era of COVID-19 Pandemic

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Abstract: Patient was a 55-year-old man with history of pancreas neuroendocrine tumor grade 2, Ki-67 index 10%. He was treated with surgical resection. ^{68}Ga-DOTANOC PET/CT was performed as part of follow-up of known disease. The images showed opacities in both lungs' parenchyma with moderate uptake of radiotracer and mediastinal lymph nodes with high uptake suggestive of infection. Two weeks before a high-resolution CT was performed, these findings in the lungs were not present. The patient was asymptomatic and was referred to the emergency department for reverse transcriptase–polymerase chain reaction COVID-19 test, and the result was positive.

Key Words: ^{68}Ga-DOTA PET/CT, COVID-19, neuroendocrine tumor

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REFERENCES

1. WHO. Coronavirus disease (COVID-19) Pandemic. https://www.who.int/emergencies/diseases/novel-coronavirus-2019. Accessed September 6, 2020.
2. Instituto Nacional de Salud, Colombia.www.ins.gov.co/Noticias/paginas/coronavirus.aspx. Accessed September 6, 2020.
3. Paez D, Gnanasegaran G, Fanti S, et al. COVID-19 pandemic: guidance for nuclear medicine departments. *Eur J Nucl Med Mol Imaging*. 2020;47:1615–1619.
4. Virgolini I, Ambrosini V, Bomanji J, et al. Procedure guidelines for PET/CT tumour imaging with ^{68}Ga-DOTA–conjugated peptides: ^{68}Ga-DOTA-TOC, ^{68}Ga-DOTA-NOC, ^{68}Ga-DOTA-TATE. *Eur J Nucl Med Mol Imaging*. 2010;37:2004–2010.
5. Albano D, Bertagna F, Bertoli M, et al. Incidental findings suggestive of COVID-19 in asymptomatic patients undergoing nuclear medicine procedures in a high prevalence region. *J Nucl Med*. 2020;61:632–636.
6. Hofman M, Lau W, Hicks R, et al. Somatostatin receptor imaging with ^{68}Ga-DOTATATE PET/CT: clinical utility, normal patterns, pearls, and pitfalls in interpretation. *Radiographics*. 2015;35:500–516.
7. Scarlattei M, Baldari G, Silva M, et al. Unknown SARS-CoV-2 pneumonia detected by PET/CT in patients with cancer. *Tumori*. 2020;106:325–332.
8. Stasiak C, Cardoso F, de Almeida S, et al. Incidental finding of COVID-19 infection after ^{68}Ga-PSMA-11 PET/CT imaging in a patient with prostate cancer. *Eur J Nucl Med Mol Imaging*. 2020;19–20.
9. Vicente AMG, Castrejón AS. Incidental COVID-19 pneumonia on ^{18}F-fluorocholine PET/CT. *Clin Nucl Med*. 2020;45:e376–e377.
10. Olivari L, Riccardi N, Rodari P, et al. COVID-19 pneumonia: increased choline uptake with ^{18}F-choline PET/CT. *Eur J Nucl Med Mol Imaging*. 2020;47:2476–2427.

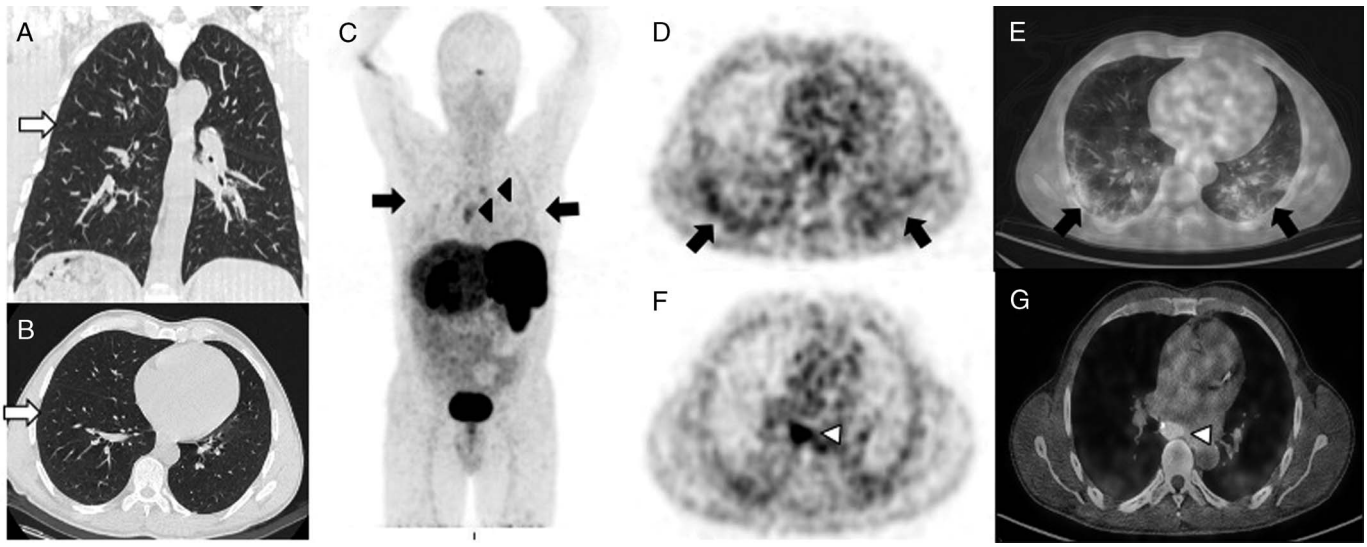

FIGURE 1. A and B, High-resolution CT was performed in a 55-year-old man with pancreas neuroendocrine tumor grade 2 Ki-67 index 10% for follow-up of known disease 2 weeks before the ^{68}Ga-DOTANOC PET/CT was performed. The findings were negative for infection or metastases (white arrows). C, Afterward, a ^{68}Ga-DOTANOC PET/CT was performed. Maximum intensity projection image shows moderate and diffuse uptake in both lungs (black arrows) and high uptake in mediastinum (black arrowheads). No sites of metastatic disease were found. D and E, PET and PET/CT axial section demonstrates bilateral, multifocal, and peripheral ground-glass opacities with more involvement in both inferior lobes (SUVmax 4.3) and moderate somatostatin receptor expression in the lungs (black arrows) suggestive of COVID-19 infection. These findings were not present in the CT previously. F and G, PET and PET/CT axial section with right hilar, subcarinal, and Aortopulmonary window lymph nodes (white arrowhead), with high radiotracer uptake (SUVmax 5.5) suggestive of inflammatory process and COVID-19 infection. On January 30, 2020, the WHO Director-General Dr Tedros Adhanom Ghebreyesus declared the 2019-nCoV outbreak a public health emergency of international concern. By September 6, 2020, 7:00 PM GMT-5, there were 26,994,442 confirmed cases, 880,994 deaths, and 216 countries affected.[1] In Colombia, by September 6, 2020, 5:00 PM GMT-5, the confirmed cases are 666,521 with 21,412 deaths.[2] The nuclear medicine departments around the world have had a challenge in facing the pandemic. They did not discontinue their operation. The "COVID-19 Pandemic: Guidance for Nuclear Medicine Departments"[3] suggested some recommendations. One of these is the incidental COVID-19 finding in hybrid study that involves a CT of the chest. If COVID-19 findings are detected in the lungs, it must be reported immediately. The image acquisition of ^{68}Ga-DOTA peptides PET/CT is from the head to the middle of the upper leg[4] and includes the chest. Therefore, there may be incidental detection in chest part in asymptomatic but infected cases undergoing scans for other indications.[5] Moreover, uptake in inflammatory processes is described in ^{68}Ga-DOTA peptides because white blood cells including leukocytes and macrophages express somatostatin receptor 2,[6] and it should be considered in COVID-19 times. There are few cases reported of COVID-19 findings in PET/CT with radiotracers different from ^{18}F-FDG. Scarlattei et al[7] reported 5 cases of unknown SARS-CoV-2 pneumonia detected by PET/CT with ^{18}F-FDG, ^{18}F-choline, and ^{68}Ga-prostate-specific membrane antigen. Stasiak et al[8] reported 1 case with COVID-19 infection after ^{68}Ga–prostate-specific membrane antigen-11 PET/CT imaging in a patient with prostate cancer. Moreover, Vicente and Castrejón[9] and Olivari et al[10] reported one case with incidental COVID-19 pneumonia on ^{18}F-choline PET/CT for biochemical recurrence of prostate cancer and COVID-19 pneumonia increased choline uptake with ^{18}F-choline PET/CT, respectively. However, none of these case reports are with ^{68}Ga-DOTA peptides. This case demonstrates findings of COVID-19 in ^{68}Ga-DOTANOC PET/CT in an asymptomatic patient with the infection confirmed by reverse transcriptase–polymerase chain reaction.