

# Incidental COVID-19 Pneumonia on $^{18}\text{F}$ -Fluorocholine PET/CT

Ana María García Vicente, MD, PhD, and Ángel Soriano Castrejón, MD

**Abstract:** We present the case of a patient who underwent  $^{18}\text{F}$ -fluorocholine PET/CT for biochemical recurrence of prostate cancer in which bilateral pneumonia was diagnosed. In the current state of COVID-19 pandemic, a high prevalence of incidental pneumonia may be expected, even with previous clinical triage, explained by a nondefined number of patients who were asymptomatic or minimally symptomatic for infectious process. Therefore, nuclear medicine physicians should be prepared to recognize and diagnose incidental COVID-19 pneumonia manifestation on  $^{18}\text{F}$ -fluorocholine PET/CT, due to the crucial epidemiological implications.

**Key Words:**  $^{18}\text{F}$ -fluorocholine, COVID-19 pandemic, PET/CT, pneumonia  
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From the Nuclear Medicine Department, Hospital General Universitario de Ciudad Real, Real, Spain.

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All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

Correspondence to: Ana María García Vicente, MD, PhD, Nuclear Medicine Department, University General Hospital, C/ Obispo Rafael Torija s/n. 13005, Ciudad Real, Spain. E-mail: angarvice@yahoo.es.

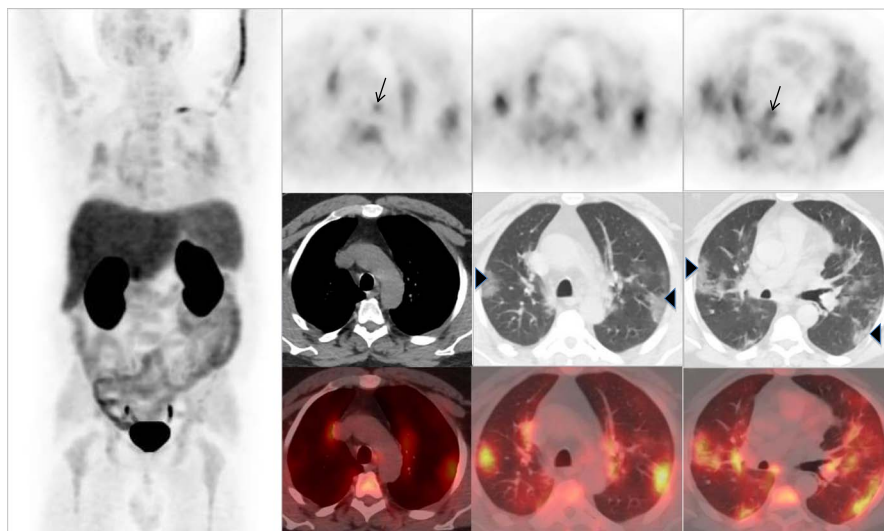
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**FIGURE 1.** A 49-year-old man with diabetes mellitus and prostate cancer (Gleason 6) treated with radical prostatectomy.  $^{18}\text{F}$ -fluorocholine PET/CT was requested for biochemical recurrence (prostate specific antigen of 0.84 ng/mL). No pathological locations related to the oncological disease were observed on  $^{18}\text{F}$ -fluorocholine PET/CT. However, increased metabolism in lung opacities (arrowheads) and some mediastinal lymph nodes (arrows) were observed. Patient was completely asymptomatic at the moment of PET/CT and had only mild cough, 2 weeks ago. Patient was referred to emergency department. Real-time polymerase chain reaction, to detect viral nucleotides from specimens obtained from nasopharyngeal swab, was positive for COVID-19. Based on COVID-19 having pulmonary tropism, pneumonia seems to be very prevalent, up to 56% or 80%, depending on the series.<sup>1,2</sup> The most discriminating features for COVID-19 pneumonia included a peripheral and lower zone dominance distribution and bilateral involvement (arrowheads). The morphological features are diverse, consisting of ground-glass opacity, reticular pattern, and vascular thickening, among others.<sup>3,4</sup> Although COVID-19 infections do not seem to be accompanied by lymphadenopathy in terms of nodal enlargement detected on standard CT,<sup>5,6</sup>  $^{18}\text{F}$ -FDG and  $^{18}\text{F}$ -fluorocholine can detect lymphadenitis.<sup>7,8</sup>



**FIGURE 2.** Chest x-ray (CXR) performed as part of clinical triage in the emergency department was reported as normal. Despite the moderate sensitivity of baseline CXR in the detection of pneumonia, CXR is the first-line triage tool in most European hospitals.<sup>2</sup> Although CXR findings mirror those previously described for CT, the latter is more sensitive in the diagnosis of viral pneumonia especially during the early stages of disease development.<sup>9</sup> Although  $^{18}\text{F}$ -FDG PET/CT plays an important role in evaluating inflammatory and infectious pulmonary diseases,<sup>10,11</sup>  $^{18}\text{F}$ -fluorocholine is able to demonstrate the lung inflammatory burden in COVID-19 infection and an important tool in order to take decisions related to epidemiological and clinical recommendations given to patients.<sup>12</sup>