



Increased lung signal as a hint of COVID-19 infection on Tc-99m-sestamibi myocardial perfusion scintigraphy

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A 50-year-old man was referred for myocardial perfusion scintigraphy (MPS) at the beginning of the COVID-19 epidemic. Cardiovascular risk factors were dyslipidemia and HIV-positivity. The patient complained of the apparition of chest pain during exercise since one month, but did not present symptoms of COVID-19. For MPS, medical staff and the patient were all wearing personal protective equipment in prevention of COVID-19 infection. Tc-99m sestamibi (232 MBq) was injected intravenously during pharmacological stress by regadenoson. Gated cardiac SPECT acquisition was acquired 20 minutes post injection on a cadmium zinc telluride camera (D-SPECT[®], Spectrum Dynamic Medical). On the initial 3D reconstruction of the thorax used to check the quality of the SPECT acquisition, high signal was observed in both lungs (Figure 1A). Gated stress MPS was considered as normal (Figure 1B). In order to understand the origin of this increased signal in the lungs, a chest CT was performed and showed the presence of ground-glass opacity and crazy-paving pattern predominating in the lower lobes of both lungs in subpleural locations (Figure 1C, D) in favor of COVID-19 infection. The patient was immediately referred to the COVID clinics of our hospital and underwent RT-PCR of nasal swab, which confirmed active COVID-19 infection.

Tc-99m-sestamibi is a lipophilic cation that diffuses passively through the cellular membrane of a variety of cells including myocytes, and is then sequestered in mitochondria. Focal Tc-99m-sestamibi lung uptake has been described in patients with primary lung carcinoma or metastasis as well as in patients with inflammatory and infective lung diseases such as sarcoidosis, pneumonia and tuberculosis.¹ Diffuse Tc-99m-sestamibi uptake can be observed in patients with low left ventricular ejection fraction, but also has been reported in patients with interstitial lung diseases. On autopsy of patients who died from COVID-19, diffuse alveolar damage with intense infiltration of mononuclear cells and macrophages and thickening of the alveolar walls have been observed in lungs.² The diffuse extra-cardiac Tc-99m sestamibi signal observed in the lungs of this patient with COVID-19 might be explained by the increased vascular permeability in relation to lung inflammation as well as by the cellular uptake in activated macrophages and fibroblasts rich in mitochondria.

As stated in the recent ASNC recommendation paper,³ nuclear cardiology labs should be organized to identify symptoms of active COVID-19 infection and prevent stress testing and imaging of these patients. The case of this patient illustrates, however, that the presence of high signal in the lungs on Tc-99m MIBI-MPS, in particular in patients with normal left ventricular ejection fraction, can be a hint of asymptomatic COVID-19 infection.

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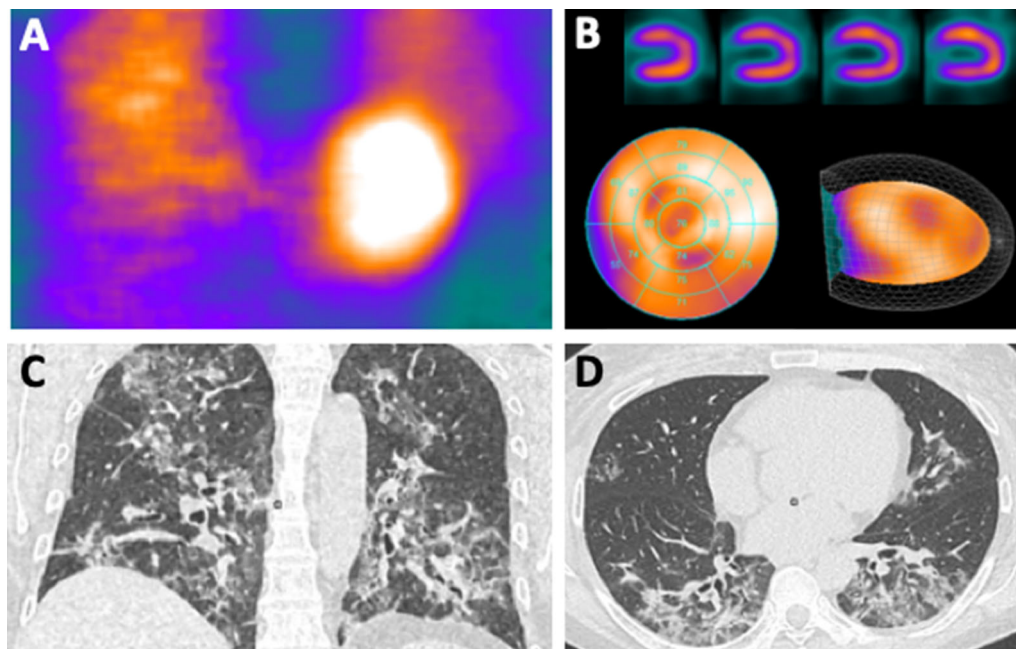


Figure 1. **A** On 3D projections of the chest obtained from quality controls of the D-SPECT, note the high signal in both lungs. **B** Myocardial perfusion imaging and left ventricular function were both normal. **C, D** Coronal (**C**) and axial (**D**) views of the chest CT scan showed ground-glass opacities with crazy-paving pattern in subpleural regions of both lungs typical of COVID-19 infection.

References

1. Gedik GK, Ergun EL, Aslan M, Caner B. Unusual extracardiac findings detected on myocardial perfusion single photon emission computed tomography studies with Tc-99m sestamibi. *Clin Nucl Med* 2007;32:920-6.
2. Li H, Liu L, Zhang D, Xu J, Dai H, Tang N, et al. SARS-CoV-2 and viral sepsis: Observations and hypotheses. *Lancet* 2020;395:1517-20.
3. Loke KSH, Tham WY, Bharadwaj P, Keng FYJ, Huang Z, Idu MB, et al. Adapting to a novel disruptive threat: Nuclear Cardiology Service in the time of the Coronavirus (COVID-19) Outbreak 2020 (SARS REBOOT). *J Nucl Cardiol* 2020. <https://doi.org/10.1007/s12350-020-02117-0>.

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