

Lung Scintigraphy Imaging Features in a Young Patient With COVID-19

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Abstract: A 31-year-old man developed diarrhea, fatigue, and intermittent fever for 2 weeks. The past few days he had experienced increasing dyspnea and dry cough. Ambulatory reverse transcriptase–polymerase chain reaction testing was positive for SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2). Because of elevated D-dimer (1.5 mg/L), a lung scintigraphy (V/Q scan) was performed as SPECT/CT. Ventilation SPECT showed reduced ventilation with central nuclide deposition, whereas perfusion SPECT was inconspicuous, excluding pulmonary embolism. However, the low-dose CT revealed bilateral ground-glass opacities as previously described in COVID-19. This case highlights the procedure and findings of V/Q scanning (without embolism) in COVID-19.

Key Words: COVID-19 pneumopathy, lung scintigraphy, SARS-CoV-2

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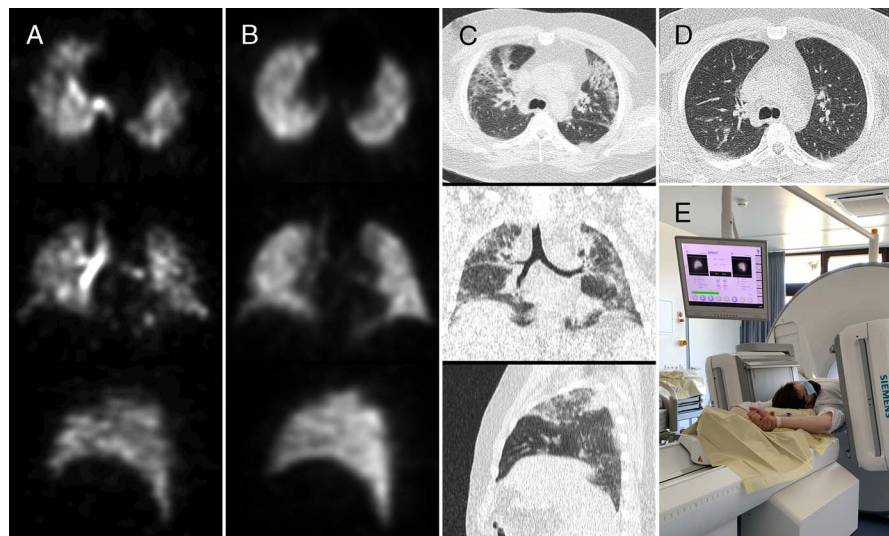


FIGURE 1. A 31-year-old man with a history of long-term corticosteroid treatment because of sarcoidosis with isolated renal and splenic involvement presented with a severely reduced walking perimeter (<5 m) and a significant hypoxia. He progressively developed a severe acute respiratory distress syndrome associated to the coronavirus disease with severe dyspnea, an increased respiratory rate, and dry cough. Because of elevated D-dimer (1.5 mg/L), the patient underwent a V/Q scan to exclude an associated pulmonary embolism **A**, The ventilation SPECT after inhalation of approximately 40 MBq ^{99m}Tc -technegas (Cyclomedica Europe Ltd, Dublin, Ireland) reveals an inhomogeneous deposition. The axial (upper panel), coronal (central panel), and sagittal (bottom panel) views illustrate a pronounced bronchial nuclide accumulation and a reduced distal alveolar tracer deposition, both in line with pathologically reduced ventilation. **B**, After intravenous injection of 162 MBq ^{99m}Tc -macroaggregates of albumin (Pulmocis; Curium, Paris, France), the perfusion SPECT shows a normal distribution of the radiotracer. The lack of mismatch effectively excludes pulmonary embolism. **C**, The concomitantly acquired low-dose CT reveals ground-glass opacities in the bilateral upper lobes accompanying the respiratory syndrome, which is in line with lung affection in COVID-19.^{1–8} **D**, For comparison purposes, reference chest CT acquired 10 months before to evaluate the extent of sarcoidosis. No granulomatous inflammation, pulmonary fibrosis, or lung opacities were initially reported. **E**, Recommended imaging setup in SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2)-infected patients.⁹ All preparation and imaging steps may potentially contaminate personnel and environment. Patients are frequently coughing after inhalation of the radiopharmaceutical, which may further expose nuclear medicine workers to aerosolized secretions. Thus, the ventilation study should be carefully indicated and possibly omitted or performed only in case of a perfusion defect.¹⁰ Health care personnel (physician only) in the room wear FFP2 filtering face pieces, eye protection, gloves, and a gown as recommended; the patient is also wearing a surgical mask during the whole imaging process. In addition to the decontamination process, disposable cover sheets (yellow sheets) offer an additive reduction of potential contamination risks. Preferably, imaging studies in COVID-19 should be performed as last examinations during working days.