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IMAGE OF THE MONTH

# Lung perfusion [$^{99m}$Tc]-MAA SPECT/CT to rule out pulmonary embolism in COVID-19 patients with contraindications for iodine contrast

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In patients suffering from 2019 novel coronavirus disease (COVID-19) and associated pulmonary infiltrates, pulmonary embolism (PE) represents a differential diagnosis which could alter therapy [1]. The gold standard to rule out significant PE in patients with COVID-19 pneumonia is a contrast-enhanced CT-scan (ceCT) [2, 3]. In patients with contraindications for iodinated contrast-media, perfusion single-photon emission tomography (SPECT) using [$^{99m}$Tc]-labeled-macroaggregated albumin (MAA) could be an alternative. We present a 59-year-old female patient, with high fever and respiratory symptoms since 1 week. A swab test was COVID-19 positive, matching typical mild ground-glass infiltration on an unenhanced CT scan (Fig. 1a), with a CT-based total severity score (TSS) of 4 [4]. The initial D-dimer was 935 μg/l. Supportive therapy and prophylactic anticoagulation was initiated. Although she reported clinical improvement, oxygen demand increased after 6 days. Ruling out PE with ceCT was not possible due to known severe anaphylactic reactions in the past despite premedication. A SPECT/CT with 180 MBq [$^{99m}$Tc]-MAA was acquired. Despite large wedge-shaped perfusion defects on SPECT (Fig. 1 b) the scan ruled out significant PE, given that all perfusion defects correlated with pulmonary infiltrates or consolidations in the CT lung window, which would result in ventilation defects on V/Q-scans (Fig. 1c, d), as further explained in the accompanying editorial [5]. The TSS for the second CT was 12, compatible with severe to critical disease [4]. Three days later, the D-dimer dropped to 409 μg/l without initiation of therapeutic anticoagulation. Respiratory distress increased, indicating invasive ventilation. After 5 days of invasive ventilation, the pulmonary capacity started to improve again, and the patient recovered.

This article is part of the Topical Collection on Infection and inflammation

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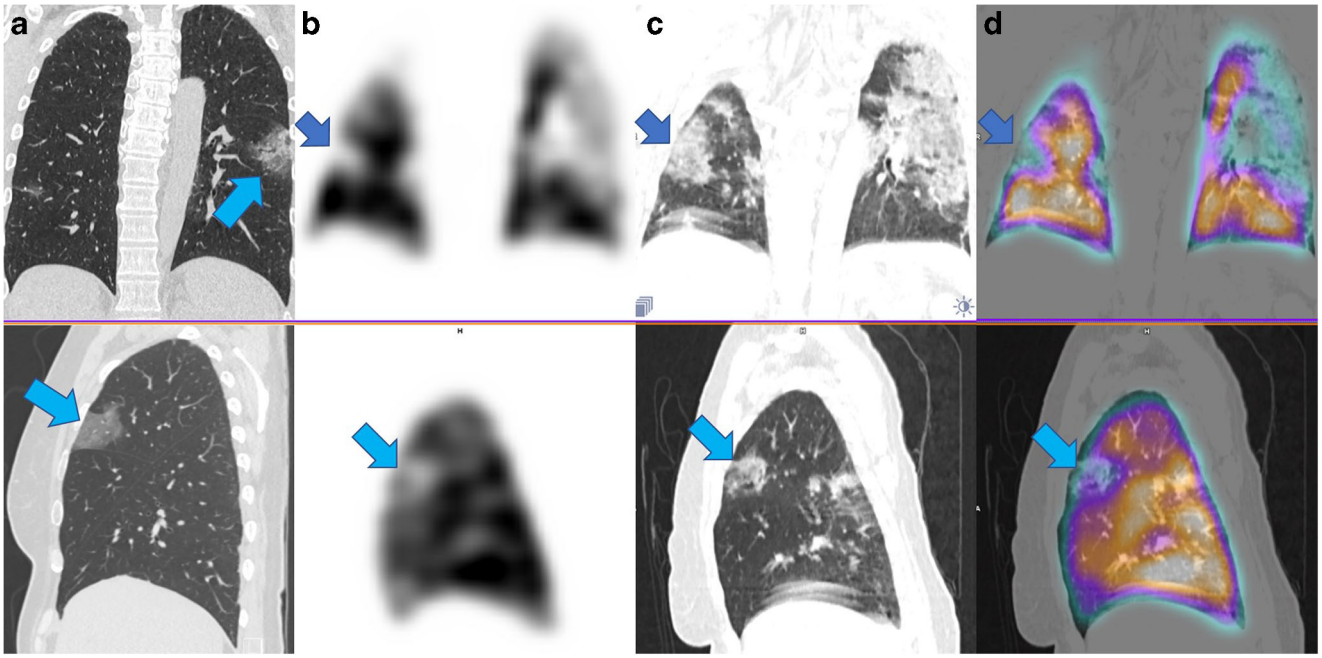


## Compliance with ethical standards

**Competing interests** The authors declare that they have no competing interests.

**Ethics approval** Not applicable.

**Informed consent** General consent for case publication was given by patient.

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