

MRI appearance of COVID-19 infection

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Dear Editor,

On December 31st, 2019, the first case of coronavirus disease-19 (COVID-19) was reported in Wuhan, China. Rapid human-to-human transmission led to a fast worldwide pandemic (1). Clinical symptoms are often unspecific and similar to a common cold and/or influenza: fever and cough, which may be combined with dyspnea, headache, fatigue, and muscle soreness, are the main clinical symptoms (2).

Typical findings on computed tomography (CT) are ground-glass opacities, crazy paving, consolidations, multilobar occurrence, and rounded opacities (3). Reports of magnetic resonance imaging (MRI) appearance are lacking. This is the first report describing MRI of a patient infected with COVID-19. Diagnosis was

confirmed by polymerase chain reaction (PCR) of an upper airway smear. In this patient, an infection with COVID-19 was not suspected at the time of imaging and findings were made incidentally during a contrast-enhanced MRI of the liver. This report shall draw attention to COVID-19 suspicious findings on MRI.

A 47-year-old male with a known malignant primary disease received an MRI scan in an outpatient setting to evaluate new and suspicious liver lesions. Prior to the examination, the patient had no known or reported contact to a COVID-19 positive index-person and no suspicious travel history. The patient presented with slight abnormal fatigue but no typical clinical symptoms for a COVID-19 infection were recognized or reported.

A contrast-enhanced MRI of the upper abdomen with liver-specific contrast agent (gadoxetate disodium at 0.025 mmol/kg body-weight, Bayer AG) was performed. Parts of the chest and especially the inferior lung segments were covered on multiple sequences.

The MRI demonstrated bilateral multilobar focal lung infiltrations, several of which were inhomogeneous with peripheral preference, and some demonstrated direct contact to the visceral pleura, sparing the subpleural space. The majority of these lesions appeared round, while a few lesions were linear. The larger, circular round consolidations showed a slightly hyperintense rim on T2-weighted sequences, probably correlating with the previously described halo sign on CT (4). These consolidations appeared iso- to hyper-

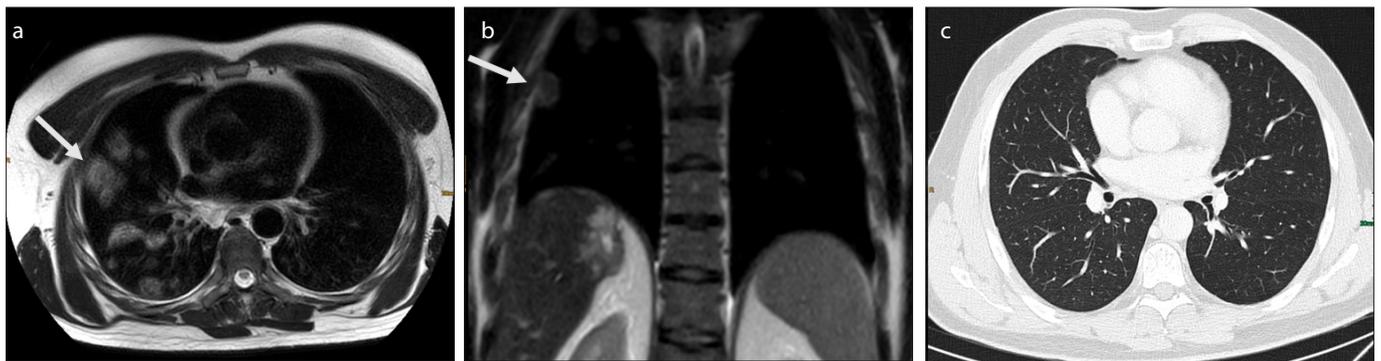


Figure 1. a–c. MRI of a patient with COVID-19 infection. Transversal (a) and coronal (b) T2-weighted images show multilobar distributed focal lesions (a, b, arrow), which appeared recently compared with a CT scan acquired 2 months earlier (c).

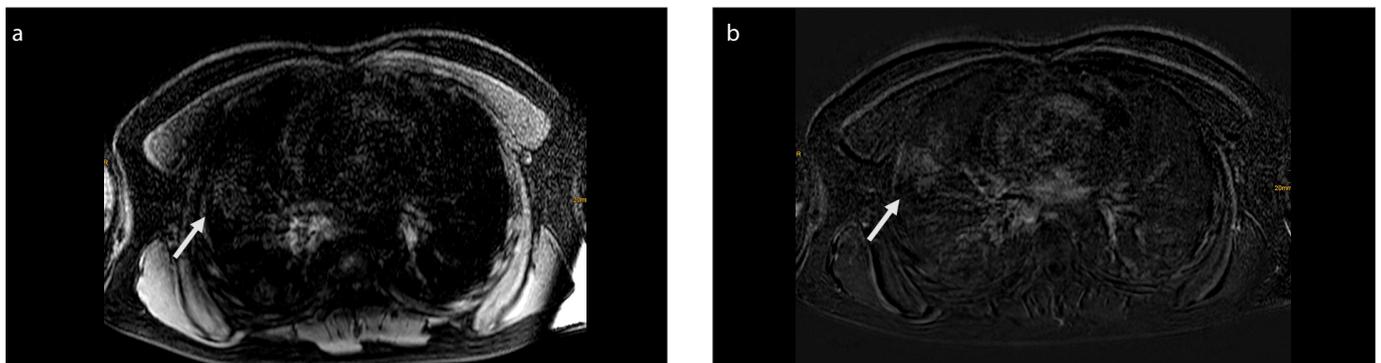


Figure 2. a, b. T1-weighted sequences pre-contrast (a) and 4 minutes after contrast injection (subtraction) (b) with bilateral, multiple, slightly enhancing lung consolidations (a, b, arrow).

intense on T2-weighted images (Fig. 1) and isointense on unenhanced T1-weighted images. After intravenous administration of Gd-EOB-DTPA, the infiltrations demonstrated mild enhancement (Fig. 2). Only a small pleural effusion was found on both sides. In knowledge of the prior reported findings on CT (3, 4), the patient showed several typical imaging criteria of COVID-19, which can be delineated on the MRI, even if the lung was only partially covered.

With the rapidly increasing number of COVID-19 infections, clinicians and radiologists should be aware of incidental findings in all imaging modalities. Earlier identification of these patients reduces the risk of additional infections for contact persons and therefore plays an important role for disruption of the chain of infection. COVID-19 suspicious findings should be reported immediately in all radiologic

examination to allow subsequent testing and isolation.

In conclusion, radiologists should be alarmed if patients, even with no or slight clinical symptoms, show suspicious findings on MRI presenting with bilateral multilobar, nodular, and predominantly peripheral mild contrast enhancing consolidations in the lung.

Conflict of interest disclosure

The authors declared no conflicts of interest.

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