Magnetic resonance imaging (MRI) chest in post-COVID-19 pneumonia

A 61-year-old male, reverse transcription-polymerase chain reaction (RT-PCR) positive for COVID-19, was admitted to our hospital with features of moderate acute respiratory distress syndrome (ARDS). He was a known case of type-2 diabetes mellitus and was treated with steroids, remdesivir, and high-flow oxygen through a Venturi mask. He was discharged in a stable condition.

However, the patient complained of persistent dyspnea on walking and climbing stairs. During his post recovery phase, his baseline partial oxygen saturation was 96%, which decreased to 90% after 6-min walk test.[1] He underwent computed tomography (CT) and magnetic resonance imaging (MRI) chest after 53 and 55 days of symptom onset, respectively. The CT chest was acquired on SOMATOM Definition Flash (Siemens Healthcare, Forchheim, Germany), and the images shown [Figure 1, left pane] are reconstructed images of 1 mm thickness with pulmonary B80F kernel. MRI images [Figure 1, right pane] are respiratory-gated, fast-BLADE turbo spin-echo images acquired on 1.5 Tesla MAGNETOM Aera (Siemens Medical Solutions, Malvern, PA, USA). The information provided by both modalities was similar. Both showed areas of parenchymal bands, septal thickening, traction bronchiectasis and bronchiolectasis, crazy-paving, and pleural thickening. The patient was diagnosed with "fibrotic-like" changes as sequelae of COVID-19 pneumonia.[2]

The advancing age, ARDS, longer hospital stay, mechanical ventilation, high severity score on baseline CT, raised erythrocyte sedimentation rate, and eosinophil counts are reported to be the independent predictors of fibrotic lung changes in patients recovering from COVID-19.[2]

MRI has been emerging as a radiation-free alternative, comparable to CT, combining functional and morphological information. MRI provides high tissue contrast, which is

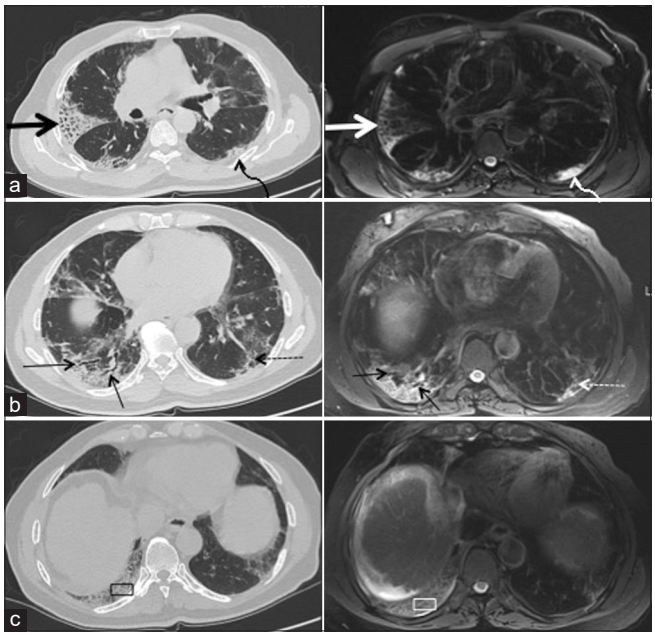

Figure 1: Axial sections of CT chest (left pane) and corresponding sections of MRI chest (right pane) showing sequelae of COVID-19 pneumonia as areas of septal thickening and traction bronchiectasis (thick arrows in a) and pleural thickening (curved arrows in a), traction bronchiectasis (thin arrows in b) and parenchymal bands (dashed arrows in b), and crazy-paving (boxes in c). Both imaging modalities provided comparable image quality and information

beneficial in identifying fibrotic changes in the lung.[3] High signal-to-noise ratio has been achieved in MRI by developing rapid image acquisition with the help of parallel imaging and under-sampling methods, as well as by reducing susceptibility artifacts caused by air.[4]

In patients with sequelae of COVID-19 infection, repeat imaging by CT is often needed to evaluate the progression and severity of the sequelae, thus giving considerable radiation exposure to the patients. A recent study by Torkian *et al*.[5] showed that MRI lung has similar capabilities as CT scan in depicting changes of COVID-19 pneumonia. Our present case also shows the comparable image quality of lung MRI and CT in delineating the extent and features of post-COVID-19 pneumonia. Thus, MRI being the radiation-free modality can be utilized more frequently as follow-up imaging tool in patients with COVID-19 pneumonia.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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