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MinIP technique may be helpful in diagnosing COVID-19

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Dear Editor,

I would like to share my observation related to the use of MinIP technique in COVID-19 diagnosis.

Coronavirus disease 2019 (COVID-19), which has been declared as a pandemic, is mainly diagnosed by real time-polymerase chain reaction (RT-PCR) and chest CT examination. Chest CT is especially helpful in cases with a high clinical suspicion and a negative RT-PCR test at initial presentation (1).

Frequently reported chest CT findings of COVID-19 include ground-glass opacities (GGO), consolidations, intra- or interlobular septal thickenings, air-bronchograms, and pleural changes. Subpleural curvilinear lines, vascular enlargements, a halo or a reversed halo sign, and an air bubble sign are encountered less frequently (2). As the disease progresses, enlarged lymph nodes, cavitations, pericardial and pleural effusions may also be seen (1–3).

Perhaps, more interestingly, small air pockets appearing in the areas with GGOs or consolidations are another COVID-19 related features. These little structures of air density are probably secondary to expansion of bronchioles or the resorption of consolidations (1, 2). These air bubbles seen in COVID-19 pneumonia do not meet the previously defined cyst or cavity definition (4), and thus represent a new class of pulmonary lesions.

For a detailed chest CT examination, a slice thickness of 1 mm is preferable; using thicker slices, small lesions can be easily missed. On the other hand, creating minimum intensity projection (MinIP) images with a slab thickness of 4–5 mm using the original CT data increases the conspicuity of the aforementioned tiny air bubbles. While air bubbles are not noticeable in normal thin-section CT images, they can be easily noticed when looked after performing the MinIP technique (Figs. 1 and 2). By definition, MinIP technique enables the detection of low-density structures in a given volume.

Figure 1. A 27-year-old male COVID-19 patient presenting with fever and dry cough for 3 days. MinIP image with a slab thickness of 4 mm shows small air opacity *(arrow)* and a small nodule surrounding ground glass opacities (GGOs) in the posterior segment of the right upper lobe.

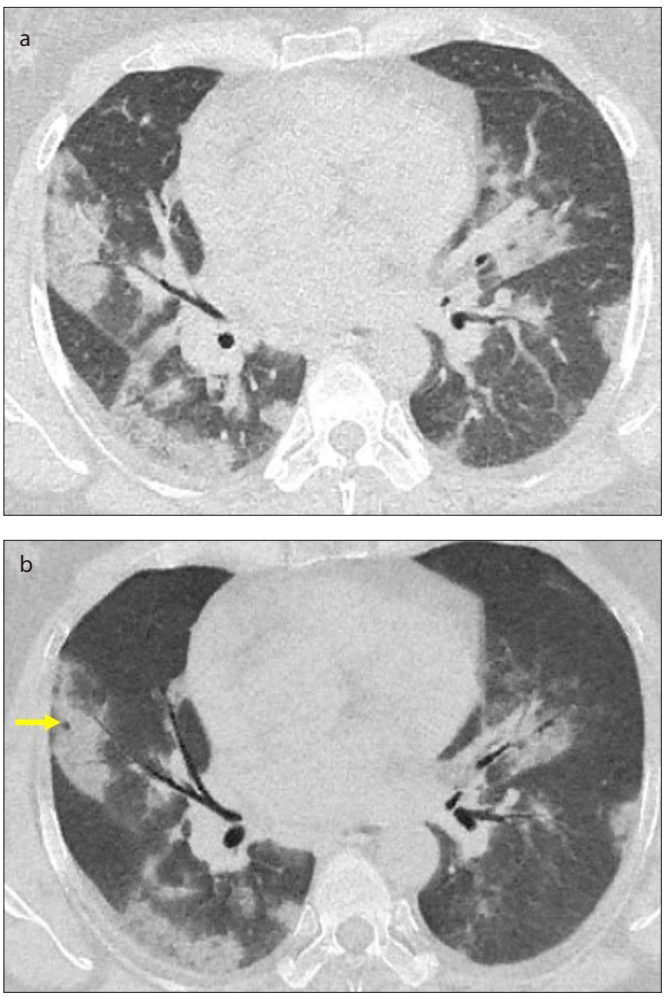

Figure 2. a, b. A 47-year-old female COVID-19 patient presenting with fever and myalgia for 7 days. CT image **(a)** shows bilateral patchy consolidations and GGOs. MinIP image **(b)** with a slab thickness of 5 mm shows a small round air bubble in the lateral segment of the right middle lobe *(arrow)*; this feature does not appear in normal CT sections.

In my clinical experience, in COVID-19 patients with tiny air-containing structures within the GGOs and consolidations on their CT scans, a positive PCR test is encountered more frequently. This observation needs confirmation through radiological studies.

Conflict of interest disclosure

The authors declared no conflicts of interest.

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