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Three Dimensional Thorax Computed Tomography Findings in COVID-19

Mehmet Atalar[1], Ömer Tamer Doğan[2]

A 47-year-old woman with spells of dry cough, malaise, headache, and nausea presented to a pandemic hospital with a progressive respiratory difficulty for two days. On physical examination, her body temperature was 36.2°C, arterial blood pressure 110/80 mm Hg, heart rate 80 beats/min, respiratory rate 20/min, and 02 saturation 96%. She had polyphonic rhonchi in both hemithoraces. Laboratory tests showed a C-reactive protein level of 28.3 mg/L (normal: <5 mg/L), an erythrocyte sedimentation rate of 34 mm/hour (normal: 0–20 mm/hour), a lactate dehydrogenase level of 233 U/L (normal: 90–220 U/L), and a D-dimer level of 596 mg/L (<500 mg/L). Other laboratory tests were within normal limits. She underwent a low-dose thoracic computed tomography (CT) examination for a suspected diagnosis of pneumonia. Thoracic CT examination showed scattered areas of ground-glass opacity in both hemithoraces, which had a nodular and patchy pattern (Fig. 1A, B). The CT images taken by the three-dimensional volume rendering and maximum intensity projection techniques showed that the lesions were at the posterior and peripheral segments of the middle and lower lobes and that they were extending along bronchovascular structures (Fig. 1C, D). As the patient's thoracic CT signs were compatible with COVID-19 disease, a real-time polymerase chain reaction (RT-PCR) test was taken, which was positive for COVID-19. The patient was administered a hydroxychloroquine, oseltamivir, and azithromycin treatment. Patient's consent was obtained for this study.

The basic CT findings of COVID-19 include bilateral subpleural, peripheral ground-glass opacities at early stages, and airspace consolidations and bronchovascular thickening at later stages. The basal and posterior parts of the lungs are more commonly involved. However, in addition to the basic signs, a wide array of signs, including a crazy-paving pattern, tree-in-bud appearance, reverse halo sign, air bronchogram, subpleural bands, vascular dilation, cavitation, and mediastinal lymphadenopathy, can also be observed in COVID-19 cases (1–3). In the differential diagnosis, infectious (e.g., other viral pneumonia, atypical bacterial pneumonia) and non-infectious conditions (e.g., pulmonary edema, interstitial lung diseases) should be considered.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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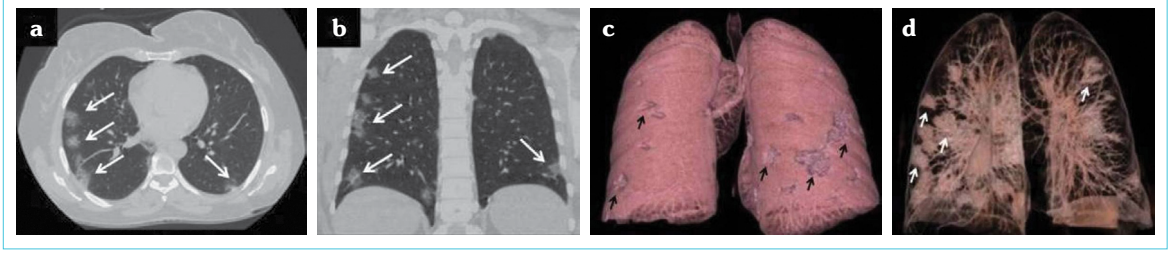

Figure 1. (a) Axial non-contrast enhanced thoracic computed tomography image in the parenchyma window shows areas of infiltration with ground-glass density at the posterior and subpleural segments of both lungs (arrows). (b) Coronal non-contrast enhanced thoracic computed tomography image in the parenchyma window shows areas of infiltration with ground-glass density at the posterior and subpleural segments of both lungs (arrows). (c) Thoracic computed tomography image obtained by three-dimensional volume rendering technique clearly shows ground-glass opacities at the posterior segments of both lungs (short black arrows). (d) Three-dimensional maximum intensity projection technique image demonstrates ground-glass opacities close anatomical adjacency with vascular structures (short white arrows)

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[1]Department of Radiology, Cumhuriyet University Faculty of Medicine, Sivas, Turkey
[2]Department of Chest Diseases, Cumhuriyet University Faculty of Medicine, Sivas, Turkey

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Correspondence
Mehmet Atalar,
Cumhuriyet University Faculty of Medicine, Department of Radiology, TR-58140 Sivas, Turkey
Phone: +90 346 258 02 89
e-mail: mhatalar@gmail.com

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