


Early CT in COVID-19: Should I or Should I Not

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Little over a year since the first reported case of COVID-19, and close to 100 million cases later, the disease remains an enigma to the scientific world and continues to be a challenge from diagnosis to treatment.¹

The clinical spectrum of COVID-19 extends from asymptomatic or pre-symptomatic infection to critical illness causing respiratory failure, septic shock, and multi-organ dysfunction.² Both clinical and laboratory markers, including hematological and immunological, have been determined to define the disease severity.^{3,4}

Lung infiltrates involving more than 50% of lung fields are classified as severe COVID-19 disease.^{2,3} Computed tomography (CT) imaging of lung parenchyma though routinely used for evaluation of disease severity in multiple studies, disagreement exists among the physicians, concerning the utility of CT imaging in COVID-19 and the timing of the investigation. The principal reason is due to an array of radiological findings, atypical presentations, and perceived limited clinical merits.

In this edition, Aalinezhad et al. compared the early CT chest findings with capillary oxygen saturation of patients diagnosed with COVID-19 disease.⁵ The study is bespoke of an inverse correlation between the CT severity score and oxygen saturation. Albeit a small number, 27 patients with hypoxia had a higher CT severity score when compared to patients without hypoxia (18.14 ± 7.43 in hypoxic patients juxtaposed to 2.64 ± 7.25 in patients without hypoxia). The study also showed higher CT severity scores in patients with pre-existing illnesses, but interestingly the findings were not similar when increasing age was compared with CT severity score. Highlights of this study were that both the imaging and oxygen levels were compared at the early part of the disease and both the investigations were done within 24 hours of each other. Early imaging also nullified the potential effect of any therapeutic intervention like ventilation on CT findings.

The study is extremely appropriate to the prevailing situation and exerts interest for further discussion on the role of CT imaging in COVID-19 disease and needs further refinement.

First and foremost is the timing of CT imaging in a patient with confirmed COVID-19 disease. Ding et al. demonstrated a varying pattern of CT abnormalities in various stages of the disease, and most importantly showed that over one-fifth of the patients did not show any CT abnormalities until after 4 days of symptom onset.⁶ The authors also showed that the disease findings changed rapidly up to 10 days of initial symptoms and stabilized thereafter, reflecting the pathological stages of the disease. Similarly, Francone et al. in their analysis involving 130 patients, demonstrated an increase in CT severity score after 7 days of symptom onset when compared to early imaging.⁷ Although a very early CT imaging of the lungs may underestimate the disease severity, early CT might help in

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establishing the baseline status of lung parenchyma and detect other underlying pathologies that might characterize disease progression.

Percentage of lung aeration of less than 73% at admission on lung CT imaging is associated with higher intensive care admissions and mortality.⁸ Higher CT severity scores have also been shown to predict clinical severity and progression, need for mechanical ventilation, and thus can supplement the other clinical and laboratory parameters for triaging the patients to intensive care units and early aggressive and appropriate therapy.^{7,9,10}

This brings to a rather perplexing situation with a difficult question, if or not to order a CT imaging in the early stage of COVID-19. The early use of CT imaging of lungs in confirmed cases of COVID-19 is a predicament that we cannot even conjecture. The scientific understanding of the disease is in continuous influx, so is the knowledge on CT findings of COVID-19. Current literature has indubitably shown the usefulness of lungs CT imaging in the diagnosis, staging, triaging, and prognosis of patients with COVID-19 disease. The clinician should be aware of limitations, atypical presentations, the time frame of the disease during which the imaging is undertaken to maximize the utility of early CT in a devastating pandemic of COVID-19.

We would like to conclude by the famous quote of John Milton from *Paradise Lost*, “For good unknown sure is not had or had and yet unknown is has had not at all”. Despite having the CT imaging, if one does not know when and how to use it, it is as had not at all.

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