Radiology: Cardiothoracic Imaging

Vascular Abnormalities as Part of Chest CT Findings in COVID-19

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Editor:

We read with great interest the recently published Expert Consensus Statement on reporting chest CT findings related to COVID-19 (1). Even though knowledge about COVID-19 still grows rapidly, we are convinced that structured reporting should be implemented and will help radiologists recognize specific patterns, suggestive signs, and atypical ones. The initiative also establishes accurate terminology, thus facilitating communication and supporting shared decision-making.

The consensus statement describes and stratifies high-resolution CT findings according to the likelihood of COVID-19 pneumonia, including characteristic and frequent parenchymal changes, non-specific and less frequent signs, and atypical appearances. We would like to comment that including vascular abnormalities in the spectrum of CT findings may provide added value to the diagnosis.

Vascular changes described in COVID-19 pneumonia were referred to as “vascular thickening,” and were reported both in clinical (2) and postmortem studies. Although the pathophysiology underlying these focal vascular changes remains uncertain, they play a potential diagnostic role. Comparing COVID-19 to non-COVID-19 pneumonia, Bai et al. found that vascular thickening was significantly associated with COVID-19 (59% vs. 22%, $p<0.001$) (3), indicating that vascular enlargement carries specificity for COVID-19. Consequently, this sign should be taken into account to distinguish COVID-19 from viral pneumonia, one of the principal differential diagnoses from the imaging point of view.

Interestingly, the authors present cases of unenhanced and contrast-enhanced chest CT, suggesting that selected patients may benefit from intravenous iodinated contrast injection for effective diagnosis and management. Depending on disease severity, patients having COVID-19 may have coagulation disorders leading to elevated D-dimer levels and increased risk of venous thromboembolism (4). Abrupt deterioration of the patient’s medical condition should raise suspicion of cardiovascular complications and prompt CT angiography if deemed appropriate, since associated diagnoses such as pulmonary embolism may impact therapeutic decisions (5).

In conclusion, non-contrast chest CT is appropriate for most patients undergoing imaging for suspected viral lung infection. Typical COVID-19-related pulmonary findings can be detected on non-enhanced chest CT, including the vascular thickening sign that may help discriminate COVID-19 from other diseases. CT angiography should be considered in particular clinical scenarios such as unexplained respiratory worsening or new-onset chest pain.

References:

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Thank you to the authors for their interest in our expert consensus statement on reporting chest CT findings related to COVID-19. We are aware of the publications mentioned in the letter to the editor, but at present there is insufficient evidence to support the finding of “vascular thickening” or “vascular enlargement” in pulmonary lesions as an indicator of COVID-19 pneumonia. Our manuscript does note that “as radiologists’ experience with COVID-19 increases, our categorization of [these] findings as typical, indeterminate, or atypical may evolve.” Further investigations may

clarify the definition, significance, and reproducibility of this CT feature as an indicator of COVID-19 infection.