Editorial

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Pneumonia Associated with 2019 Novel Coronavirus: Can Computed Tomographic Findings Help Predict the Prognosis of the Disease?

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In this issue of the *Korean Journal of Radiology* (KJR), Lin et al. (1), while reporting computed tomography (CT) findings of two cases of the 2019 novel coronavirus (2019-nCoV or officially named by the World Health Organization as COVID-19) pneumonia, demonstrated that multiple areas of patchy consolidation and ground-glass opacity (GGO) are main CT findings of the infection. The lesions in their cases were typically distributed along the bronchovascular bundles or subpleural regions in the bilateral lungs.

Similarly, in a recent report published in the *Radiology*, Chung et al. (2) described CT findings of 2019-nCoV pneumonia in 21 symptomatic patients. Representative CT findings included bilateral pulmonary parenchymal GGO and consolidation. Notably, cavitary lung lesions, discrete pulmonary nodules, pleural effusions, and lymphadenopathy were absent. Follow-up CT in a subset of patients demonstrated mild or moderate disease progression, as manifested by the increasing extent and density of lung opacities.

CT findings of viral pneumonia in immunocompetent adults have been well known. Although the findings overlap among various pneumonias caused by diverse viral organisms, CT features include poorly defined centrilobular nodules, GGO with a lobular distribution, segmental consolidation, and diffuse GGO with thickened interlobular septa (3). Pleural effusion or necrotic lung abnormality is rarely seen. Particularly, in severe acute respiratory syndrome, for which corona viruses are also being implicated, common CT features are GGO and lower lobe and peripheral lung distributions (4). In middle-east respiratory syndrome (MERS) caused by coronavirus infection, bilateral subpleural and lower lung zone-predominant GGO and consolidation were the most commonly observed findings (5, 6).

The main role of imaging in viral infection lies in the detection or exclusion of pneumonia. Other roles include narrowing down of the differential diagnosis of pneumonia with respect to the involved causative organisms in consideration of the patterns, distribution, and extent of lung abnormalities. Further diagnostic approaches may be clued into. The response to antibiotic therapy may be evaluated using follow-up imaging studies (7). Particularly with the pattern approach, viral pneumonia in an immunocompetent cohort can be further divided into three patterns, namely, bilateral bronchopneumonia, organizing pneumonia, and diffuse alveolar damage patterns. With this approach, patient management (necessitating ventilation support) and prognostication could be determined. Kang et al. (8) evaluated chest CT findings of influenza A pneumonia and correlated the results with the clinical outcome. They classified CT findings of pneumonias into organizing pneumonia, diffuse alveolar damage, and bronchopneumonia patterns and concluded that patients presenting with the diffuse alveolar damage pattern tend to

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show a poor prognosis and need ventilation therapy in the intensive care unit (8). In cases of MERS, the mean number of lung segments involved was higher in the mortality group than in the recovered group, and pleural effusion correlated with a poor prognosis (9).

Although CT findings of 2019-nCoV pneumonia were well described in the current study (1) and in the study by Chung et al. (2), the authors did not depict the detailed distribution or the extent of lung abnormalities. With a detailed analysis, authors could have drawn specific patterns of lung abnormalities, including organizing pneumonia, bilateral bronchopneumonia, and diffuse alveolar damage patterns. If such a pattern could have been drawn, the patient prognosis could have been predicted.

Conflicts of Interest

The author has no potential conflicts of interest to disclose.

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REFERENCES

1. Lin X, Gong Z, Xiao Z, Xiong J, Fan B, Liu J. Novel coronavirus pneumonia outbreak in 2019: computed tomographic findings in two cases. *Korean J Radiol* 2020 [Epub]. https://doi.org/10.3348/kjr.2020.0078
2. Chung M, Bernheim A, Mei X, Zhang N, Huang M, Zeng X, et al. CT imaging features of 2019 Novel Coronavirus (2019-nCoV). *Radiology* 2020 Feb 4 [Epub]. https://doi.org/10.1148/radiol.2020200230
3. Kim EA, Lee KS, Primack SL, Yoon HK, Byun HS, Kim TS, et al. Viral pneumonias in adults: radiologic and pathologic finidings. *Radiographics* 2002;22 Spec No:S137-S149
4. Wong KT, Antonio GE, Hui DS, Lee N, Yuen EH, Wu A, et al. Thin-section CT of severe acute respiratory syndrome: evaluation of 73 patients exposed to or with the disease. *Radiology* 2003;228:395-400
5. Ajlan AM, Ahyad RA, Jamjoom LG, Alharthy A, Mandani TA. Middle East respiratory syndrome coronavirus (MERS-CoV) infection: chest CT findings. *AJR Am J Roentgenol* 2014;203:782-787
6. Choi WJ, Lee KN, Kang EJ, Lee H. Middle East respiratory syndrome-coronavirus infection: a case report of serial computed tomographic findings in a young male patient. *Korean J Radiol* 2016;17:166-170
7. Lee KS, Kim TJ, Peck KR, Han J. Infectious pneumonia in immunocompetent patients: updates in clinical and imaging features. *Precis Future Med* 2018;2:79-94
8. Kang H, Lee KS, Jeong YJ, Lee HY, Kim KI, Nam KJ. Computed tomography findings of influenza A (H1N1) pneumonia in adults: pattern analysis and prognostic comparisons. *J Comut Assit Tomogr* 2012;36:285-290
9. Das KM, Lee EY, Enani MA, AlJawder SE, Singh R, Bashir S, et al. CT correlation with outcomes in 15 patients with acute Middle East respiratory syndrome coronavirus. *AJR Am J Roentgenol* 2015;204:736-742