Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Pulmonary Pathology of Early Phase 2019 Novel Coronavirus Pneumonia

To the Editor:

We read the publication on "Pulmonary pathology of early phase 2019 novel coronavirus (COVID-19) pneumonia in two patients with lung cancer" with great interest.[1] Tian et al.[1] concluded that "the lungs of both patients exhibited edema, proteinaceous exudate, focal reactive hyperplasia of pneumocytes with patchy inflammatory cellular infiltration, and multinucleated giant cells" and noted that "these changes likely represent an early phase of the lung pathology of COVID-19 pneumonia." Although this pathologic finding might be a lung abnormality in COVID-19, it should not be referred to as COVID-19 pneumonia because the patients did not have pneumonia. In a previous report of a case with pneumonia and severe respiratory distress, fibromyxoid exudates and hyaline membrane formation were the main histopathologic findings.[2] Asymptomatic or mildly symptomatic COVID-19 is possible[3] and the pathologic findings in the lungs mentioned by Tian et al.[1] should correspond to that case.

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Pathology of 2019 Novel Coronavirus Pneumonia: A Dynamic Disease Process

To the Editor:

Thank you for forwarding the letter by Joob and Wiwanitkit[1] regarding our recent paper "Pulmonary pathology of early phase 2019 novel coronavirus (COVID-19) pneumonia in two patients with lung cancer."[2] We thank Dr. Joob and Dr. Wiwanitkit for their interest in our work and appreciate their comments.

In our paper, we described two patients who came to the hospital for elective surgical resections of SCLC at the time when COVID-19 was spreading in Wuhan and even more so in hospitals, but when stringent infection preventive measures had not yet been implemented owing to low public awareness. Afterward, both patients were confirmed to have developed COVID-19 pneumonia. Retrospective reviews revealed radiographic changes in the patients' lungs around the time of the operation. Both patients had a history of exposure to the virus. Although the patients did not exhibit symptoms at the time of the operation, subsequent pathologic examination revealed changes as reported in the paper;[2] thus, this represents the early changes seen in COVID-19 pneumonia. As we know, many diseases can have radiographic or pathologic changes before clinical symptoms develop.

To be more specific, what the physician finds and what the patient feels are not always synchronized. Post operation on day 1, patient 1 had increased white blood cell count and lymphocytopenia, which are not consistent with the usual nonspecific postoperative responses.

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Instead, they are consistent with what has been described in many patients with COVID-19. Patient 2 exhibited evident ground-glass opacity in the lungs as early as on day 2 post operation. These are signs of early COVID-19 pneumonia, given the subsequent development of respiratory symptoms and more typical radiographic changes, as well as positive nucleic acid tests.

Dr. Joob and Dr. Wiwanitkit compared our findings with those described by Xu et al.[3] The latter is a case report of a postmortem core biopsy in which the patient died of the disease. Changes there represent a late, advanced stage of COVID-19 pneumonia. We know that diseases evolve and progress in a subpopulation of patients. For most fatal acute infectious diseases, pathologic studies are on autopsies, which only reveal the most advanced stage of the disease. Even though the two patients referred to in our paper eventually progressed to severe pneumonia (one died), our findings in their lobectomy specimens represent the early, presymptomatic stage of the disease. For these reasons, what we have reported[2] is particularly valuable in helping us understand the evolution of the disease better and is not just a simple "snapshot" of the disease. In other words, it is more important to learn about the dynamic "live" pathology than "dead" pathology.

With more data accumulating, we now know that the underlying pathology of COVID-19 is that of diffuse alveolar damage in which hyaline membrane formation is only one of the histologic changes and usually appears late. We saw in our two patients that its progression starts with an exudative process.

Finally, what we have described in the article should not be interpreted as pathologic changes of asymptomatic or mild COVID-19 because both patients progressed to severe disease and one died. Most patients with asymptomatic or mild COVID-19 should not have any lung pathology at all, although the patients may be positive for either viral sequence in pharyngeal swab polymerase chain reaction or serologic tests.[4] COVID-19 refers to the disease caused by the 2019 Novel Coronavirus (Severe Acute Respiratory Syndrome Coronavirus 2). A small percentage of patients develop pneumonia, and thus it is designated as COVID-19 pneumonia.

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