

First-ever pathology of the early phase of lung infection with the 2019 novel coronavirus (COVID-19)

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An international team of clinicians and researchers for the first time have described the pathology of the SARS-CoV-2, or coronavirus, and

published their findings in the *Journal of Thoracic Oncology*, the journal of the International Association for the Study of Lung Cancer.

The article's senior author, Shu-Yuan Xiao, M.D., from the University of Chicago Medicine in Chicago, teamed up with a small group of clinicians from the Zhongnan Hospital of Wuhan University, in Wuhan, China.

"This is the first study to describe the pathology of disease caused by SARS-CoV-2, or COVID-19 pneumonia, since no autopsy or biopsies had been performed thus far," Dr. Xiao said. "This would be the only descriptions of early phase pathology of the disease due to this rare coincidence. There would be no other circumstance that this will happen. Autopsies will only show late or end stage changes of the disease."

The article describes two [patients](#) who recently underwent lung lobectomies for adenocarcinoma and were retrospectively found to have had COVID-19 at the time of surgery. Pathologic examinations revealed that, apart from the tumors, the lungs of both patients exhibited edema, proteinaceous exudate, focal reactive hyperplasia of pneumocytes with patchy inflammatory cellular infiltration, and multinucleated giant cells. Fibroblastic plugs were noted in airspaces.

"Since both patients did not exhibit symptoms of pneumonia at the time of surgery, these changes likely represent an early phase of the lung pathology of COVID-19 pneumonia," Dr. Xiao said.

CASE 1 was a female patient of 84 years of age who was admitted for treatment evaluation of a tumor measuring 1.5 centimeters in the right middle lobe of the lung. The tumor was discovered on chest CT scan at an outside hospital. She had a past medical history of hypertension for 30 years, as well as type 2 diabetes. Despite comprehensive treatment, assisted oxygenation, and other supportive care, the patient's condition

deteriorated, and she died. Subsequent clinical information confirmed that she was exposed to another patient in the same room who was subsequently found to be infected with the 2019 novel [coronavirus](#).

CASE 2 was a male patient of 73 years of age, who presented for elective surgery for lung cancer, in the form of a small in the right lower lobe of the lung. He had a past medical history of hypertension for 20 years, which had been adequately managed. Nine days after lung surgery, he developed a fever with dry cough, chest tightness, and muscle pain. A nucleic acid test for SARS-CoV-2 came back as positive. He gradually recovered and was discharged after twenty days of treatment in the infectious disease unit.

According to the study, these two incidences also typify a common scenario during the earlier phase of the SARS-CoV-2 outbreak, during which a significant number of healthcare providers became infected in hospitals in Wuhan, and patients in the same hospital room were cross-infected, as they were exposed to unknown infectious sources. The presence of early lung lesions days before the patients developed symptoms, corresponds to the long incubation period (usually 3-14 days) of COVID-19. Making it difficult to prevent transmission during the early days of this outbreak, as many healthcare workers in Wuhan became infected, when they were seeing patients without sufficient protection, according to Dr. Xiao. As of today, more than 15 doctors in Wuhan died of COVID-19, from infections while they were taking care of patients. Some of them were previously healthy and as young as 29 years old.

"We believe it is imperative to report the findings of routine histopathology for better understanding of the mechanism by which the SARS-CoV-2 causes [lung](#) injury in the unfortunate tens and thousands of patients in Wuhan and worldwide," Dr. Xiao said. Further studies by Dr. Xiao's team and collaborators on COVID-19 pathology through

postmortem biopsies are ongoing, which should provide data on the late changes of this disease.

More information: Sufang Tian et al, Pulmonary pathology of early phase 2019 novel coronavirus (COVID-19) pneumonia in two patients with lung cancer, *Journal of Thoracic Oncology* (2020). [DOI: 10.1016/j.jtho.2020.02.010](https://doi.org/10.1016/j.jtho.2020.02.010)

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