

## COVID-19 with spontaneous pneumomediastinum

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A 38-year-old man from Wuhan, China, was admitted to the Central Hospital of Wuhan (Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China), on Jan 20, 2020, with a 1-day history of fever without dizziness, cough, and headaches. On presentation, his temperature was 38.1°C. Laboratory tests showed a C-reactive protein concentration of 0.56 mg/dL (normal range 0.00–0.60 mg/dL). Complete blood count showed elevated leukocytes (10 060 cells per  $\mu$ L [normal range 3500–9500 cells per  $\mu$ L]), neutrophils (7550 cells per  $\mu$ L [1800–6300 cells per  $\mu$ L]), and monocytes (990 cells per  $\mu$ L [100–600 cells per  $\mu$ L]), while the lymphocyte count (1490 cells per  $\mu$ L) was in the normal range (1100–3200 cells per  $\mu$ L). The patient was negative for influenza A and B viruses, adenovirus, respiratory syncytial virus, and parainfluenza 1, 2, and 3 viruses. Chest CT showed multiple ground-glass opacities in the lower lobes bilaterally.

The patient was given antibacterial, antiviral, and corticosteroid treatments (moxifloxacin [0.4 g/day] for 5 days, followed by ribavirin [0.5 g/day] and methylprednisolone [40 mg/day] for 5 days) via intravenous drip infusion. However, after 10 days, the patient had persistent fever (highest temperature 38.5°C), cough, and shortness of breath. The patient was diagnosed with coronavirus

disease 2019 (COVID-19) on the basis of RT-PCR analysis of sputum samples. On day 11, the patient developed exertional angina with cardiac palpitations along with respiratory wheezing. Chest CT revealed multiple ground-glass opacities with bilateral parenchymal consolidation and interlobular septal thickening. Spontaneous pneumomediastinum and subcutaneous emphysema were also observed (figure).

Corticosteroid treatment was stopped, while ribavirin was continued at the same dosage for 14 days. Supplemental oxygen, antibiotics, antitussives, and bronchodilators were also added to the regimen, which included theophylline (0.2 g/12 h), ambroxol (45 mg/12 h), and cefoperazone–tazobactam (2 g/8 h) via intravenous drip infusion, as well as recombinant human interferon alfa-1b via aerosol (three times daily) for 14 days.

By day 25, the patient's temperature had recovered to normal (36.5°C), his cough had improved, and his breathing was normal. RT-PCR analysis of COVID-19 was negative. Chest CT revealed resolution of previous pneumomediastinum and a reduction of parenchymal consolidation with pulmonary fibrosis and pneumatocele in the inferior left lower lobe. Repeat RT-PCR was negative on day 30, and the patient was discharged for outpatient follow-up.

Although the precise mechanism of pneumomediastinum is unknown, spontaneous pneumomediastinum is usually a self-limiting disease. However, it can potentially cause severe circulatory and respiratory pathology. Therefore, the occurrence of spontaneous pneumomediastinum in COVID-19 patients should be monitored closely as a potential indicator of worsening disease.

### Contributors

CZ and CG contributed to data analysis, data interpretation, the literature search, and manuscript drafting. YX contributed to data collection, data analysis, and figure preparation. MX contributed to study design and reviewed the final draft. All authors read and approved the manuscript.

### Declaration of interests

We declare no competing interests.

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Figure: Chest CT showed spontaneous pneumomediastinum (arrow), subcutaneous emphysema, and bilateral ground-glass opacities of the lung