



Pneumothorax in 2019 novel coronavirus pneumonia needs to be recognized

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To the Editor,

We read with interest the article recently published by Judith E. Spiro et al. [1] describing a case of secondary tension pneumothorax in a 2019 novel coronavirus pneumonia (COVID-19) patient. Similarly, we treated a male patient aged 77 years, who was diagnosed with COVID-19 based on computed tomography (CT) and positive RT-PCR findings. On the 10th day after admission the patient was intubated and needed mechanical ventilation due to acute respiratory distress syndrome. Just 7 h later, a sudden drop in oxygen saturation (SO₂) from 98 to 83% was discovered. Thus, pneumothorax was suspected, and a tension pneumothorax was soon confirmed by bedside chest radiography. Immediate drainage with a chest tube was successfully established and the patients' SO₂ returned to normal. Unfortunately, the patient died of multiple organ failure on the 19th day in hospital.

The outbreak of COVID-19 has developed from a global concern to a global threat and health emergency due to the rapidly growing number of cases both in China and internationally. During this epidemic crisis, ordinary conditions, such as pneumothorax, may have been neglected. Commonly, the overall incidence of spontaneous pneumothorax has been reported to be 17–24 per 100 000 males and 1–6 per 100 000 females [2]. However, when considered in the COVID-19 population, the incidence can be 40- to hundreds-fold higher and was 1% (1/99) in a recent report [3]

and 1.3% (1/75) among the inpatients treated in the intensive care isolation ward of Wuhan Union Hospital West Campus, which is supported by doctors from the 1st Hospital of China Medical University. A total of 26–32% of early COVID-19 patients were transferred to the intensive care unit (ICU), and up to 10–47.2% of severe patients received invasive ventilation [4, 5], which will theoretically increase the occurrence of pneumothorax and accelerate the progression of pneumothorax, resulting in tension pneumothorax and a life-threatening condition, as shown in our case and in other case reports [1, 3]. Based on not only its high incidence but also the severity of disease progression, pneumothorax in COVID-19 pneumonia patients should be given more attention.

There is a bimodal age distribution for spontaneous pneumothorax, with one peak at 15–34 years and the other peak at older than 60 years in the overall population [2]. From a review of recent articles, the median age was 49–56 years, and there was a male predominance (54–73%) [3–5], which is quite similar to the second peak of spontaneous pneumothorax. This may partially explain why the incidence of spontaneous pneumothorax is so high in the COVID-19 pneumonia population.

For COVID-19 patients, the accuracy of auscultation is limited because the physicians need to wear thick isolation clothes. Generally, CT is the best choice for pneumothorax and is not only the gold standard for diagnosis but also a good method to screen underlying lung diseases. However, CT is neither practical nor safe for isolated infectious patients. Therefore, we recommend bedside chest film as the first choice, which has the advantages of both convenience and accuracy, for suspected COVID-19 pneumonia with associated spontaneous pneumothorax.

For mild patients with little pneumothorax, oxygen inhalation, and close observation can be performed. For severe patients, especially those with mechanical ventilation, chest tube drainage should be performed as soon as possible to ensure sufficient ventilation and oxygen exchange.

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If drainage is necessary, close attention must be paid to, for example, keeping the drainage tube head pointed away from the faces of the medical staff to avoid iatrogenic infections by high pressure air and pleural effusion.

We recommended continuous and negative pressure suction (-20 cm/H₂O) for chest drainage until no air leakage and obvious regression of the pneumothorax, because of the following reasons: (1) in severe COVID-19 pneumonia patients, lung consolidation causes poor lung compliance, so mechanical ventilation combined with negative pressure suction may make the lungs more fully dilated and oxygenated; and (2) COVID-19 is highly infectious, and the ICU ward has poor air circulation. Thus, negative pressure suction of pneumothorax combined with COVID-19 may decrease the risk of iatrogenic infection.

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Compliance with ethical standards

Conflict of interest The authors have no conflict of interest to disclose.

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