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Introduction

Acute severe respiratory syndrome

e coronavirus type 2 (SARS-CoV-2) is one of the coronavirus subtypes. Since December 2019, this viral illness has been a ecting a number of people in Wuhan City, Hubei Province, China [1]. e most recent [illegible] is Omicron. Close contact with persons who are sick with this illness, including those who are asymptomatic, has been the source of infection in cases that have been reported thus far. e virus is mostly spread by infected droplets and direct contact with infected individuals. In general, the population is at risk. A er infection, there are no unique clinical indications, and the majority of infected people exhibit symptoms like those of viral pneumonia, such as fever, coughing, painful muscles, etc. Results from the throat swab and imaging ndings are mostly used to make the diagnosis of the illness.

e primary characteristics of computed tomography imaging (CT) [2] include early many tiny patchy shadows and interstitial alterations, observable in the extrapulmonary zone, numerous ground glass in ltrations and in ltrates in both lungs, and pulmonary consolidation in severe instances. Pleural e usions don't happen o en. ere are four categories for clinical classi cation: mild, typical, severe, and critical. People who t one of the following descriptions are thought to be critically ill: Illnesses needing intensive care unit (ICU) monitoring and care include shock, organ failure, and respiratory failure necessitating mechanical ventilation. Dyspnea and respiratory failure can develop fast in cases of severe and serious disease. LUS is useful, non-radioactive, and essentially unrestricted by environmental conditions, making it a frequent choice for usage in urgent and emergency situations. Pulmonary edoema, lung consolidation, and pleural e usion are o en symptoms of acute respiratory distress syndrome (ARDS). e major symptoms are di use comet tail indications, which were rst detected by ultrasonography before chest radiography. Pleural e usion can also be measured using LUS. Additionally, lung re-expansion or prone ventilation are frequently needed to treat lung consolidation brought on by ARDS. Lung ultrasonography (LUS

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Case presentation

On January 30, 2020, an 82-year-old man who had a worsening cough, expectoration, and a three-day fever of 38 °C was taken to a nearby hospital. He needed long-term oxygen treatment for his everyday activities because his symptoms had been steadily becoming worse a er light exertion. He was given ambroxol and piperacillin-tazobactam in the neighbourhood hospital, but his symptoms did not get any better. e nucleic acid testing of SARS-CoV-2 from a throat swab returned positive results the next day. ese ndings, together with those from the CT scan, supported the coronavirus disease of 2019 (COVID-19) diagnosis. e patient was subsequently sent to the A liated Jinhua Hospital's Department of Intensive Care Medicine, Zhejiang University School of Medicine, for further care. All methods carried out for this study complied with the Declaration of Helsinki (as updated in 2013) and the ethical guidelines established by the institutional and/or national research committee(s). e patient's written informed consent was acquired before this case report and the associated pictures could be published. e editorial o ce of this journal has a copy of the written consent on le for examination.

Previous sickness: For more than 10 years, he had a history of asthma and chronic obstructive pulmonary disease (COPD), with his cough and expectoration always getting worse in the winter and spring.

Inspection of the body: e patient was aware but not in a good mood when examined. He had a barrel chest, pursed lips, and shortness of breath. His blood pressure was 170/84 mmHg, his temperature was 36.5 ºC, and his oxygen saturation (SpO2) was 78%. Proiosystole and arrhythmia were also seen. None of the lower limbs had edoema.

Laboratory assessments: e blood tests showed the following results: C-reactive protein (CRP) 20.1 mg/L; white blood cells 7.39×109/L; neutrophils (N) 0.926; absolute lymphocyte count 0.27×109/L; hemoglobin 155 g/L; and platelets 112×109/L.

Diagnosis: A chest CT revealed emphysema, bullae in the le upper lung, persistent right lower lung infection, and bronchitis. e following diagnoses were made: (I) pneumonia (critical illness) caused by a novel coronavirus (SARS-CoV-2); (II) respiratory failure; and (III) acute aggravation of COPD.

Treatment: e patient received treatment with oseltamivir (75 mg, nasal feeding, twice daily), lopinavir/ritonavir (3 tablets, nasal feeding, twice daily), abidol (2 tables, nasal feeding, three times daily), and cefoperazone-sulbactam (2 g, intravenously, three times daily). s. esge patient61

set in, necessitating the administration of norepinephrine to keep blood pressure stable. At this point, the cause of the shock had to be discovered right away. For the purpose of identifying shock causes, which are categorised by hemodynamic factors, the uid administration limited by lung sonography (FALLS) protocol [13] integrates cardiac ultrasonography based on the blue or blue-plus protocol as described by Lichtenstein. e patient's severe weight reduction le him with a barrel-shaped chest, making it di cult to access the cardiac regions. e ejection fraction (EF) was between 30 and 50 percent, the heartbeat was normal, and there was no serious cardiogenic pulmonary edoema, according to the available subxiphoid 4-chamber cardiac section and inferior vena cava section. e inferior vena cava allowed for the measurement of respiratory variation, and its value was 20% (Figure 1). Given that the inferior vena cava's respiratory uctuation during mechanical ventilation was larger than 18%, we assumed that the patient was uid sensitive. Due to the thorough evaluation of the size ratio of the 4 cardiac chambers and the uctuation of the inferior vena cava, we temporarily ruled out obstructive shock. Other areas of the heart could not be evaluated, and the isolation wards did not have access to invasive hemodynamic monitoring devices like the Swan-Ganz catheter and pulse index continuous cardiac output (PiCCO). As a result, it was impossible to determine the cardiac output precisely and septic shock could not be totally ruled out. In conclusion, we thought the patient's heart activity was satisfactory and that there was volume responsiveness, however there were B-lines in various lung regions, as shown by LUS. We e0 horougheeOthes5i s s heart ofsv.DnarywtuaSwan-stable. At to rt ade. At 43 Twte to keep t3nz cathet rtg6(strert.).5(ladeuas lc outj
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for more prone position ventilation, we performed the FALLS protocol in conjunction with pulmonary and cardiac ultrasonography. e BLUE procedure more accurately represented the recoverability of the lung by comparing the oxygenation and circulation parameters before and a er prone position breathing.

Acknowledgement

Not applicable.

Conflict of Interest

Author declares no con ict of interest.

References

1. Carlos WG, Dela Cruz CS, Cao B, Pasnick S, Jamil S (2020) Novel Wuhan (2019-nCoV) Coronavirus. Am J Respir Crit Care Med 201:7-8.
2. Lei J, Li J, Li X, Qi X (2020) CT Imaging of the 2019 Novel Coronavirus (2019-nCoV) Pneumonia. Radiology 295:18.
3. Cortellaro F, Colombo S, Coen D, Duca PG (2012) Lung ultrasound is an accurate diagnostic tool for the diagnosis of pneumonia in the emergency department. Emerg Med J 29:19-23.
4. Parlamento S, Copetti R, Di Bartolomeo S (2009) Evaluation of lung ultrasound for the diagnosis of pneumonia in the ED. Am J Emerg Med 27:379-384.
5. Solomon JJ, Heyman B, Ko JP, Condos R, Lynch DA (2021) CT of Post-Acute Lung Complications of COVID-19. Radiology 301:383-395.
6. Weil MH, Shubin H (1971) Proposed reclassifcation of shock states with special reference to distributive defects. Adv Exp Med Biol 23:13-23.
7. Lichtenstein D (2014) Lung ultrasound in the critically ill. Curr Opin Crit Care 20:315-322.
8. Pesenti A, Musch G, Lichtenstein D, Mojoli F, Amato MB, et al. (2016) Imaging in acute respiratory distress syndrome. Intensive Care Med 42:686-698.
9. Kumar A, Weng Y, Graglia S, Chung S, Duanmu Y, et al. (2021) Interobserver Agreement of Lung Ultrasound Findings of COVID-19. J Ultrasound Med 40:2369-2376.
10. Peixoto AO, Costa RM, Uzun R, Fraga ADM, Ribeiro JD, et al. (2021) Applicability of lung ultrasound in COVID-19 diagnosis and evaluation of the disease progression: A systematic review. Pulmonology 27:529-62.
11. Villén Villegas T (2021) Lung ultrasound in COVID-19: What has it contributedand what can it contribute? Emergencias 33:331-2.
12. Fuchs L, Feng M, Novack V, Lee J, Taylor J, et al. (2019) The E fect of ARDS on Survival: Do Patients Die From ARDS or With ARDS? J Intensive Care Med 34:374-382.
13. Lichtenstein DA (2015) BLUE-protocol and FALLS-protocol: two applications of lung ultrasound in the critically ill. Chest 147:1659-1670.
14. Seiler C, Klingberg C, Hårdstedt M (2021) Lung Ultrasound for Identifcation of Patients Requiring Invasive Mechanical Ventilation in COVID-19. J Ultrasound Med 40:339-351.
15. Guérin C, Reignier J, Richard JC, Beuret P, Gacouin A, et al. (2013) Prone positioning in severe acute respiratory distress syndrome. N Engl J Med 368:159-168.
16. González-Seguel F, Pinto-Concha JJ, Aranis N, Leppe J (2021) Adverse Events of Prone Positioning in Mechanically Ventilated Adults With ARDS. Respir Care 66:1898-911.
17. Fan E, Brodie D, Slutsky AS (2018) Acute Respiratory Distress Syndrome: Advances in Diagnosis and Treatment. JAMA 319:698-710.
18. Fan H, Tong H, Chen K (2022) Lung ultrasound-guided treatment for acute respiratory distress syndrome in a critically ill patient with severe COVID-19: a case report. Ann Palliat Med 11:3794-3803.