

A Case Report of Spontaneous Pneumothorax in the 2019 Novel Coronavirus–Infected Pneumonia

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Case Report

Keywords: COVID-19, dyspnea, pneumothorax, respiratory failure, ECMO

Posted Date: June 12th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-34276/v1>

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Abstract

Background: COVID-19, which pathogen virus officially named SARS-CoV-2, started in China Wuhan city and so far rapidly spread to a global outbreak. Since the lung is the main lesion organ for virus invasion, Chest CT is strongly recommended in COVID-19 on either initial diagnosis and follow-up. Multiple patchy shadows and ground glass opacity of bilateral lung are typical features of CT scan, and spontaneous pneumothorax appeared in the early onset of COVID-19 is rare.

Case Presentation: We reported one case of spontaneous pneumothorax in the early onset of COVID-19, chest CT showed only a small amount of pneumothorax were seen in the right lobe. After receiving 4 days of treatment, re-examination chest CT shows right pneumothorax disappeared, but the patient was clinically worse, and progressive multiple diffuse consolidation. Although treatment with extracorporeal membrane oxygenator, the patient died 15 days after admission.

Conclusion: Spontaneous pneumothorax in the early stages of COVID-19 is rare, which imaging features differ from other lung diseases complicated with pneumothorax, such as COPD. More than we usually know, the improvement of pneumothorax and the outcome of COVID-19 may be inconsistent.

Introduction

COVID-19, which pathogen virus officially named SARS-CoV-2, started in China Wuhan city and so far rapidly spread to a global outbreak (1,2). Since the lung is the main lesion organ for virus invasion, multiple patchy shadows and ground glass opacity of bilateral lung are typical features of CT scan (3), and pneumothorax appeared in the early onset of COVID-19 is rare. Here we report a fatal case of COVID-19 with spontaneous pneumothorax.

Case Presentation

A 67-year-old woman presented to the hospital with a 15-day history of low-grade fever, fatigue, cough and progressive dyspnea. She had never smoked and denied any chronic underlying illness. At admission, physical examination revealed a body temperature of 37.6°C (99.68°F), respiratory rate of 26 breaths per minute, pulse of 92 beats per minute, and 66% oxygen saturation in ambient air. Lung auscultation revealed coarse breath sounds of both lungs. Laboratory studies showed white blood cell count $9.0 \times 10^9/L$. The white blood cell differential count showed 82.9% neutrophils and 11.1% lymphocyte. There were elevated blood levels for C-reactive protein (24.07 mg/L; normal range, 0–4 mg/L), and D-dimer (7890 ng/mL; normal range, 0–500 ng/mL). Chest CT showed multiple diffuse consolidation and ground-glass opacities in bilateral lungs. A small amount of pneumothorax were seen in the right lobe (Figure, A). A nucleic acid amplification test was positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by nasopharyngeal swab. The diagnosis of severe 2019 novel coronavirus–infected pneumonia (COVID-19) was made. After receiving 4 days of treatment, the patient was clinically worse, re-examination chest CT shows right pneumothorax disappeared, but progressive multiple diffuse

consolidation(Figure, B). Although treatment with extracorporeal membrane oxygenator(ECMO),the patient died 15 days after admission.

Discussion

China and the rest of the world are experiencing an outbreak of a novel coronavirus known as SARS-CoV-2 that caused a public health emergency of international concern (4).The most appropriate treatment regimens for COVID-19 still have not been firmly established despite several new agents that are currently under investigation. Since the lung is the main lesion organ for virus invasion,chest CT is strongly recommended in COVID-19 on either initial diagnosis and follow-up.Most common features of CT scan is bilateral ground glass opacity in the disease,atypical imaging features including pleural effusion, lymphadenopathy and bronchial wall thickening[5],and spontaneous pneumothorax was rare,as pneumothorax is well-known complications of mechanical ventilation when support treatment for COVID-19.

We reported one case of spontaneous pneumothorax in the early onset of COVID-19,the virus damage to the alveoli and persistent cough in COVID-19 can be the causative factor for spontaneous pneumothorax in this patient.Though spontaneous pneumothorax occurs in the initial disease is seldom seen. it has a significant impact on treatment and prognosis, and early identification of pneumothorax is critical.When pneumothorax accompanied by respiratory failure,correcting hypoxia can be tricky. In view of exercising noninvasive or invasive ventilator can aggravate pneumothorax, ECMO may be the appropriate therapy .Calamitously,if the disease is critical, the chances of survival are slim.Our case suggests that lung tissue compression may not be severe in the presence of pneumothorax in COVID-19 compared with other diseases,such as COPD. and the improvement of pneumothorax and the outcome of COVID-19 may be inconsistent.

Conclusion

Spontaneous pneumothorax in the early stages of COVID-19 is rare,which imaging features differ from other lung diseases complicated with pneumothorax,such as COPD.More than we usually know,the improvement of pneumothorax and the outcome of COVID-19 may be inconsistent. When COVID-19 complicated with pneumothorax, it can have an impact on treatment, especially occurs with respiratory failure,which correlates with poor outcome of COVID-19.

Abbreviations

COVID-19[2019 Novel Coronavirus–Infected Pneumonia]SARS-CoV-2[severe acute respiratory syndrome coronavirus 2]ECMO[extracorporeal membrane oxygenator]COPD[chronic obstructive pulmonary disease]

Declaration

Acknowledgements

We thank all the hospital staff members (Liu J,He SQ, Liang JJ, Tang M, Wang Q, Cai YL, Yang QY, Ma X, Lin MF, Gan ZH) for their efforts in collecting the information that was used in this study.

Authors' contributions

YP and GC had roles in clinical management, CH contributed to data collections and data entry. YP and SW also wrote the manuscript. All authors reviewed and approved the final version of the manuscript.

Funding

This project was supported by the Key Research Project of Nanjing Military Area Command (grant no. 14ZD32)

Availability of data and materials

Not applicable.

Ethics approval and consent to participate

This study has been approved by the Ethics Committee of Huoshenshan Hospital (No. HSS141).

Consent for publication

Not applicable.

Competing interest

The authors declare that they have no competing interests.

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Figures

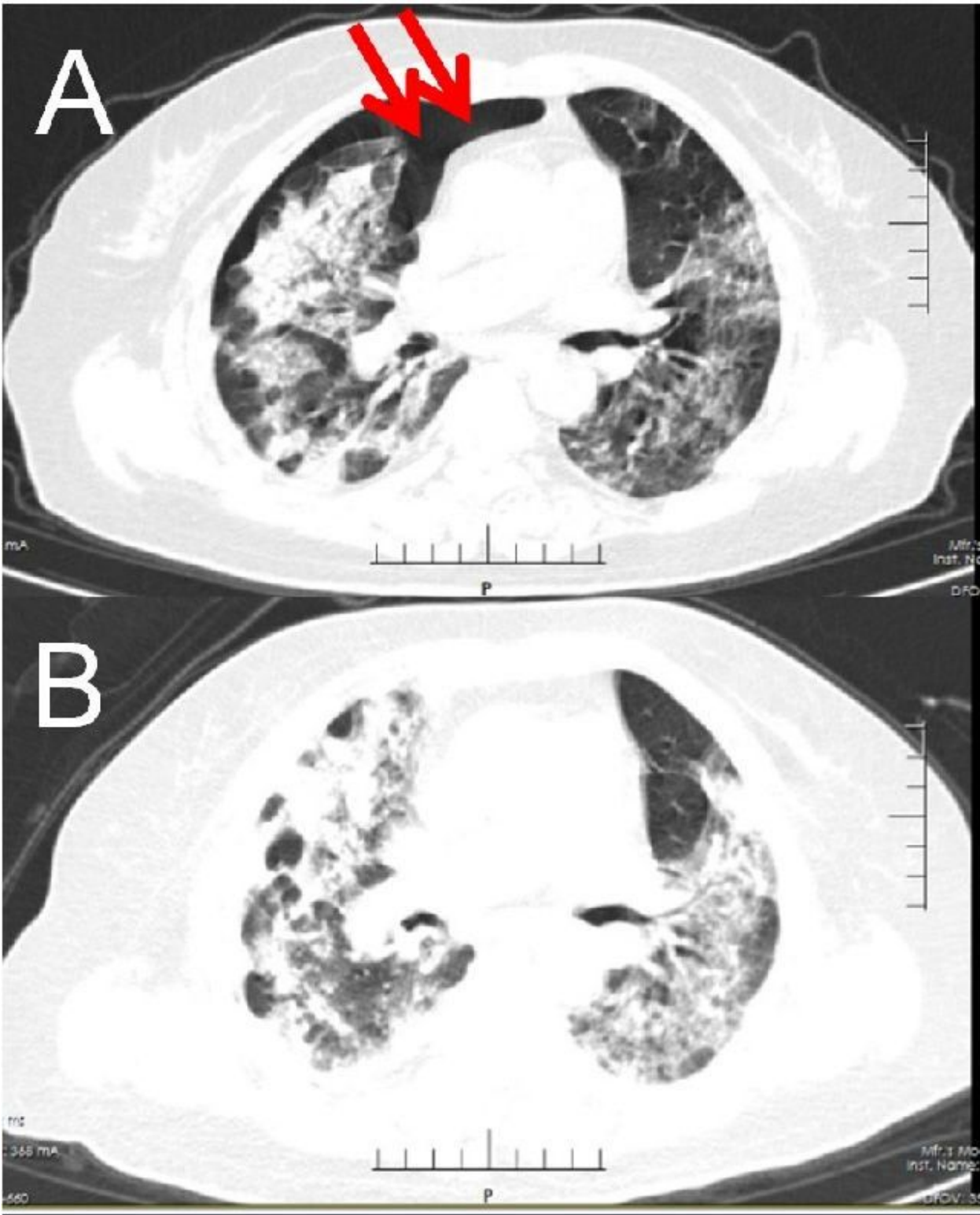


Figure 1

Chest CT images in a 67-year-old woman. A, Image shows multiple diffuse consolidation and ground-glass opacities in bilateral lungs. A small amount of pneumothorax are seen in the right lobe (red arrow). B, Image obtained 4 days after follow-up shows right pneumothorax disappeared, but progressive multiple diffuse consolidation.