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【 CASE REPORT 】

Hemoptysis and a Newly Formed Lung Bulla in a Case of Convalescent COVID-19 Pneumonia

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Abstract:
Coronavirus disease 2019 (COVID-19) is a novel infectious disease affecting the general population worldwide. A fever and cough are the common clinical presentations of COVID-19. In most of these patients, computed tomography (CT) shows bilateral peripheral ground-glass opacities. We herein report a case of hemoptysis and lung bulla in the convalescent phase of COVID-19. Based on the clinical observations, alveolar destruction was likely associated with hemoptysis and bulla formation. Therefore, we suggest the follow-up of COVID-19 patients whose clinical parameters indicate alveolar damage, even after their symptoms improve.

Key words: COVID-19 pneumonia, lung bulla, hemoptysis

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Introduction

Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory coronavirus 2 (SARS-CoV-2), has spread rapidly all over the world in 2020. The common clinical features of COVID-19 include a fever, cough, myalgia, and fatigue (1, 2). Notably, most COVID-19 patients are also diagnosed with pneumonia, including asymptomatic cases (3). During the acute phase, chest computed tomography (CT) in these patients shows bilateral peripheral ground-glass opacities with ill-defined margins that progress to consolidations and fibrosis (4, 5).

We herein report a case of convalescent COVID-19 pneumonia with hemoptysis and subpleural bulla formation on chest CT, rare clinical presentations of COVID-19.

Case Report

A 53-year-old man without a history of smoking presented to our hospital with a 5-day history of a fever, pronounced cough, and diarrhea. Informed consent to publish this information was obtained from the patient.

A physical examination revealed a body temperature of 37.1 °C, blood pressure of 124/76 mmHg, pulse rate of 94 beats/minute, respiratory rate of 24 breaths/minute, and oxygen saturation of 96% in ambient air. Laboratory testing revealed lymphopenia (830/μL), elevated levels of lactate dehydrogenase (LDH) (414 U/L) and C-reactive protein (14.5 mg/dL) and normal levels of D-dimer. Chest CT showed bilateral multifocal peripheral ground-glass opacities (Fig. 1), despite the absence of respiratory failure. He was diagnosed with COVID-19 by reverse transcription polymerase chain reaction. He was hospitalized and administered 200 mg hydroxychloroquine orally (twice daily). He did not need oxygen therapy during hospitalization and was discharged from the hospital on day 10 (after remission).

Ten days after discharge, he presented to our hospital with hemoptysis. Re-examination of the chest CT scan revealed multifocal consolidations and a subpleural bulla in the same region as the ground-glass opacities found on the first CT scan (Fig. 2A). A consolidation in the right lower lobe was suspected of being a fluid retention cyst, which had probably caused hemoptysis (Fig. 2B). He received hemostatic agent therapy orally, and the hemoptysis gradually disappeared by day 40 from the onset of COVID-19. Subsequent chest CT on day 90 from the onset of COVID-19 showed the recovery and disappearance of the subpleural bulla and consolidations (Fig. 3).

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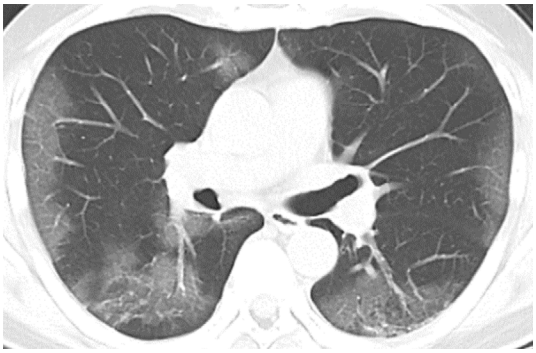

Figure 1. **Chest CT scan on admission.**

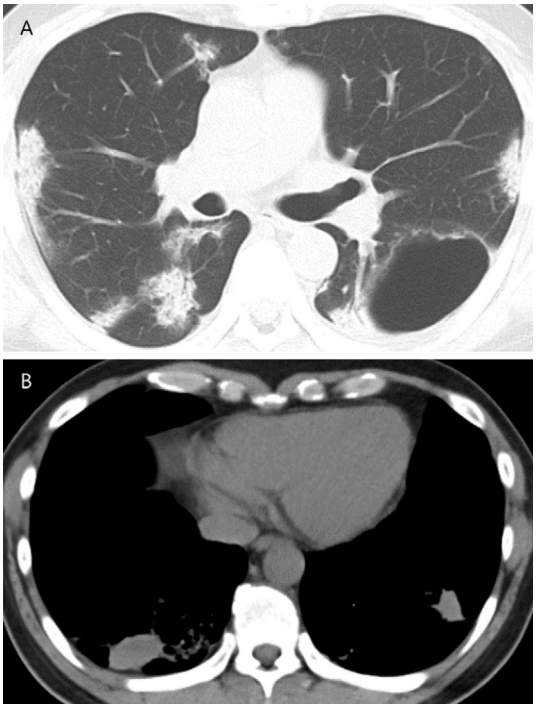

Figure 2. **Chest CT scan on day 25 from the onset of COVID-19 (A, B).**

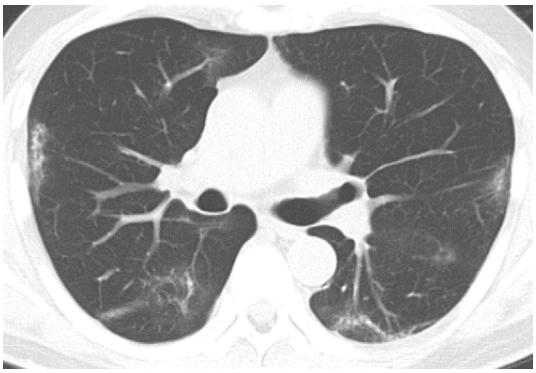

Figure 3. **Chest CT scan on day 90 from the onset of COVID-19.**

Discussion

This case is noteworthy because it demonstrates two useful observations. First, COVID-19 pneumonia can be a cause of lung bulla even without ventilation procedures and a history of pulmonary disease. Second, hemoptysis, which is a rare clinical presentation of COVID-19, can occur in the convalescent phase of COVID-19 pneumonia.

The present case did not require oxygen therapy during hospitalization; however, the elevated levels of LDH, an indicator of exacerbated COVID-19 pneumonia, suggest the existence of alveolar destruction (6). Furthermore, the increased rate of consolidative opacities on CT re-examination of the chest also indicates alveolar damage (7, 8).

Several cases of pneumothorax development have been reported during the course of COVID-19 pneumonia, wherein patients were treated without mechanical ventilation (9-13). According to these case reports, most of the patients who developed pneumothorax did not have a history of pulmonary disease, similar to our case, and their chest CT scans showed bullae or pneumomediastinum formation, which may have led to pneumothorax. The reason for bulla formation in COVID-19 patients is unclear. However, given the clinical course of our case, we strongly believe that pronounced cough and alveolar destruction are potential causes of bulla formation.

Hemoptysis is a rare clinical presentation that occurs in less than 1-5% of COVID-19 patients on admission (1, 2). In addition to alveolar destruction, pulmonary embolism can cause hemoptysis in COVID-19 patients, given that COVID-19 leads to hypercoagulation (14). However, the D-dimer level was normal in the present case, suggesting that alveolar destruction caused hemoptysis. The prevalence of hemoptysis in the convalescent phase of COVID-19 pneumonia is unknown, but it can occur in any clinical phase until the destructed alveoli have regenerated.

In conclusion, we present a case of hemoptysis and bulla formation, which are rare findings in COVID-19 patients. Our case suggests that alveolar destruction may cause lung bulla and hemoptysis. Pneumothorax caused by bulla formation can develop in COVID-19 patients, even without the use of mechanical ventilation. Importantly, pneumothorax and hemoptysis can occur in the convalescent phase of COVID-19 pneumonia. Therefore, patients with COVID-19 who are susceptible to alveolar destruction should be followed-up even after they reach remission.

The authors state that they have no Conflict of Interest (COI).

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