

Successful Lung Clearing Even after Spontaneous Pneumomediastinum and COVID-19 ARDS

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Abstract

In severe COVID pneumonia, we have seen reports of patients suffering from spontaneous pneumomediastinum, as well as pneumothorax as a unique complication. Diffuse alveolar damage can be the etiology behind this. We report a case of a 51-year-old mountaineer female who had severe COVID pneumonia, developed air leaks, but her lung injury and scarring completely improved in 5 months.

Keywords: COVID pneumonia, pneumothorax, spontaneous pneumomediastinum

INTRODUCTION

Coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is an acute respiratory illness. Its clinical presentation and complications attributed to this virus have been varied. Several case reports have been published on the occurrence of spontaneous pneumomediastinum and pneumothorax after severe COVID infection due to diffuse alveolar injury.^[1-3] We present a case of a 51-year-old female who developed spontaneous pneumothorax and pneumomediastinum during her course of illness, while she was never been on any mechanical ventilator.

CASE REPORT

A 51-year-old female, mountaineer by profession, was referred to the emergency of our institute in view of severe respiratory distress. She was found to be COVID positive via RT-PCR testing 6 days before admission at our hospital. She was conscious, oriented with normal blood pressure. However, she was extremely tachypneic with hypoxia. Her saturation was 90% on a FiO₂ of 80%.

She was immediately admitted to the intensive care unit designated for COVID patients and put on high-flow nasal cannula (HFNC). Her initial investigations revealed normal total leukocyte count, increased C-reactive protein, D dimer, lactate dehydrogenase with normal renal and liver functions.

Arterial blood gas revealed hypoxia. Chest skiagram revealed bilateral patchy consolidation.

She was treated with injection remdesivir for 5 days and methylprednisolone. The steroid was given for around a month and then slowly tapered. She also underwent awake prone ventilation. Even after 1 month of continuous treatment, her breathlessness did not improve. She developed secondary septicemia and was administered injection amoxicillin clavulanate. The blood culture, however, revealed *Acinetobacter* sensitive to carbapenems and colistin. Hence, her antibiotics were revised. When repeat RT-PCR testing was done, she was found to be COVID negative. High resolution computed tomography (HRCT) thorax revealed bilateral ground-glass appearance with interstitial thickening, pneumothorax, as well as pneumomediastinum [Figure 1]. In consultation with the pulmonologist and intensivists, it was decided that she would be managed conservatively. She was started on antifibrotics (pirfenidone) and anticoagulants (initially on fondaparinux for 1 month and then rivaroxaban). As her

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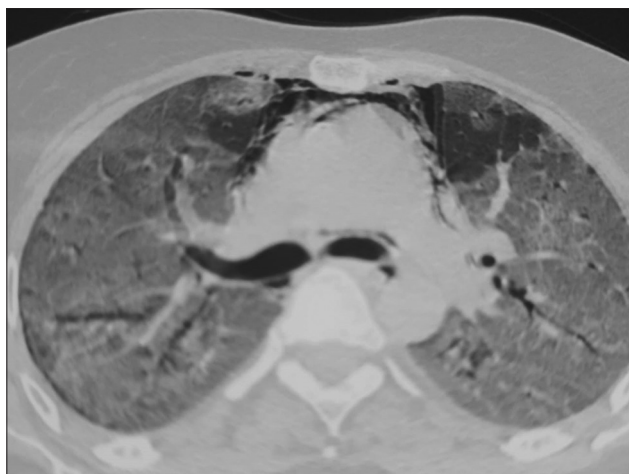


Figure 1: HRCT thorax of patient revealing bilateral ground glassing with pneumomediastinum and pneumothorax

infection settled, the antibiotics were tapered. Her oxygen requirement slowly started to decrease. We shifted her from HFNC to rebreathing mask and shifted her to the ward. The chest X-ray did not show any worsening. She improved slowly with pulmonary rehabilitating exercises. She was discharged from the hospital after 2½ months of long-term oxygen therapy and oral medications. She was advised breathing exercises to be followed at home. She showed good improvement both clinically and radiologically. Her repeat HRCT after 5 months of illness revealed resolution of ground-glass opacities and alveolar leaks [Figure 2]. She was given antifibrotics and anticoagulants for 5 months and then stopped.

DISCUSSION

SARS-CoV-2 is a RNA virus causing various clinical presentations and complications.^[1] Majority of the cases have mild infections, while others can present with serious presentations such as pneumonia, sepsis, acute respiratory distress syndrome (ARDS), and/or multiorgan failure.^[4-6] The virus uses angiotensin-converting enzyme receptor^[7] to internalize and then triggers extensive host immune response. Release of interleukin (IL)-6 and IL-1B causes uncontrolled inflammation ultimately, leading to lung scarring.^[8] Development of ground-glass opacities occurring in the intermediate/late phase and reticular alterations occurring in the early phase is the most common HRCT thorax finding. Development of pneumothorax, subcutaneous emphysema, or pneumomediastinum in a nonventilated patient is a rare finding. It is hypothesized that since SARS-CoV infects both type I and II pneumocytes,^[9] it causes breakdown of the integrity of alveolar membrane, leading to alveolar leaks. It has been found that development of air leaks is proportional to the presence of widespread lesions on CT.^[2]

To the best of our knowledge, there have been over 20 case reports mentioning this rare and fatal complication. However, all reports suggest that one needs to have conservative approach in dealing with such air leaks. The patient should



Figure 2: HRCT thorax of the same patient done after 5 months showing resolution of lung scarring and air leaks

be given adequate hydration and oxygen supply.^[3] As far as possible, positive pressure ventilation should be avoided in such patients as it may increase such leaks. However, the use of HFNC has emerged as a wonderful aid in managing such patients.

Complete resolution of the lung scarring is notable from the two scans obtained 5 months apart. This virus is still a riddle and apart from steroids,^[10] none of the drugs have been found to be completely effective against this virus.

CONCLUSION

This case highlights the fact that severe COVID pneumonia can cause alveolar leaks due to diffuse alveolar damage causing pneumomediastinum even in the nonventilated patient. If they can be managed conservatively with controlled oxygen therapy alone, these leaks can heal.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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