



## Delayed Spontaneous Pneumothorax in the COVID-19 Patient in the Highlander

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### Abstract

Covid-19 is a pandemic caused by SARS-Cov-2 primarily affecting the respiratory tract. However, there is scarce evidence of the association of a delayed spontaneous pneumothorax in a spontaneously breathing patient with covid-19. This report describes a patient with covid-19 who developed spontaneous pneumothorax after 20 days during infection without any underlying pulmonary predisposing factors. Pneumothorax in these patients if treated promptly has no bearing on clinical outcome.

**Keywords:** COVID-19; SARS-CoV-2; Spontaneous Pneumothorax; Coronavirus; Pneumothorax

### Introduction

Coronavirus disease 2019 (COVID-19) infection is a global infection that affects many countries, including Pakistan. This infection has a broad spectrum of presentations that can range from asymptomatic disease to fatal acute respiratory distress syndrome.

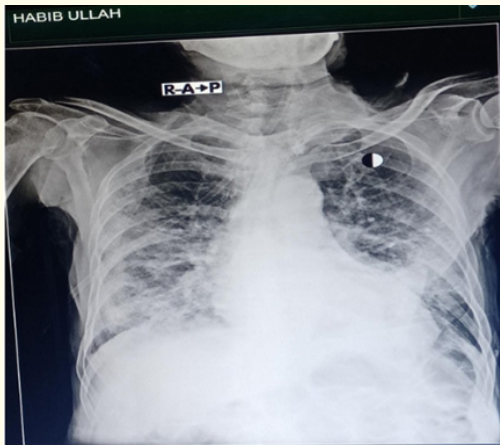
Spontaneous pneumothorax is a rare complication of COVID-19. Most of the reported cases of pneumothorax associated with COVID-19 have traditional risk factors or underlying predisposing lung disease [1-11]. This case report describes the clinical course with covid-19 infection in a spontaneously breathing patient with no major underlying pulmonary risk factors for delayed pneumothorax. Pneumothorax in these patients if treated promptly has no bearing on clinical outcome.

### Case Presentation

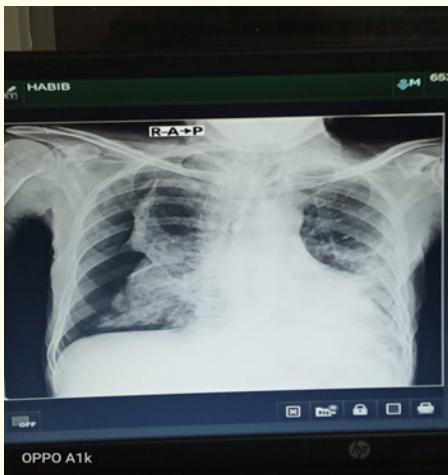
An 85-year-old gentleman with known hypertensive, ischemic heart disease (dual vessel coronary artery disease PCI done 2016) presented with complaints of fever, dry cough and dyspnoea for three days. He was a non-smoker. On examination at presentation, his BP was 130/70 mmHg, pulse rate of 92/min, SPO<sub>2</sub> was

80% at room air, 95% with face mask at 5 liters/min. He was afebrile. On chest examination, there was bilateral crepitation at the lower chest. Other system examinations were unremarkable. Laboratory investigations showed a Haemoglobin of 12.5 mg/dl, platelet count of 388,000, total leukocyte count of  $12.5 \times 10^9$  with neutrophils 93%, and lymphocytes of 4%. C-Reactive Protein was elevated. Chest X-ray showed bilaterally scattered infiltrates more prominent in lower zones (Figure 1). His nasopharyngeal COVID PCR was positive. Liver function test and renal function were unremarkable. He received COVID 19 treatment with Remdesivir 200 mg loading dose, followed with 100 mg daily for the next four days, Dexamethasone 6 mg intravenous two times daily, injection Enoxaparin 40 mg subcutaneous two times daily, injection Omeprazole 40 mg daily.

His oxygen demand progressively increased during his hospital stay and was shifted from face mask to non-rebreathable mask up to 15 liters FIO<sub>2</sub>. On the 20<sup>th</sup> day of admission, his dyspnoea worsened. On examination, there was decreased air entry on the right side. Chest X-ray was repeated, which showed right-sided pneumothorax involving more than 50% of right hemithorax (Figure 2).



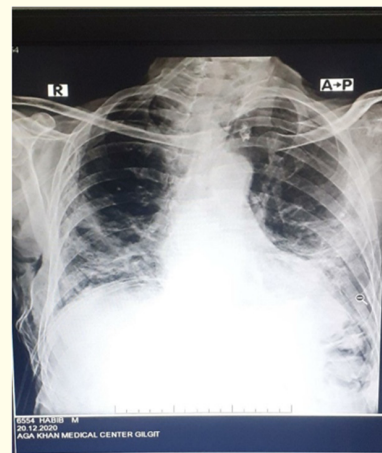
**Figure 1:** Chest X-ray AP view on presentation, showing bilateral patchy infiltrate, worse in the right lower lobe segments.



**Figure 2:** Chest X-ray showing right-sided pneumothorax (before tube thoracostomy).

Tube thoracostomy on right 5<sup>th</sup> ICS was done under aseptic measures after informed consent. Repeat chest x-ray after tube thoracostomy showed resolution of pneumothorax (Figure 3). His arterial blood gases on nonrebreathable mask (NRM) showed hypoxemia with PO<sub>2</sub> of 51.3, PCO<sub>2</sub> of 36.4, SPO<sub>2</sub> of 87%, PH 7.45, HCO<sub>3</sub> 25.9, for which he was started on non-invasive therapy with CPAP of 8 cm-H<sub>2</sub>O overnight. Repeat arterial blood gases that morning showed PH 7.41, PO<sub>2</sub> 56.6, PCO<sub>2</sub> 36.0 and SPO<sub>2</sub> 92.2%, HCO<sub>3</sub> 30.6. Repeat

chest x-ray after overnight CPAP showed worsening of pneumothorax and subcutaneous emphysema on the right side. The patient was not tolerating CPAP. His pneumothorax size increased with the positive airway pressure; therefore, he was switched to NRM with up to 15 liters, and he was maintaining SPO<sub>2</sub> of more than 92%. His chest tube remained for nine days. During this time, his oxygen requirement improved. On the 9<sup>th</sup> day, the chest tube was removed, and he was maintaining SPO<sub>2</sub> with 2 liters on a nasal cannula (Figure 4). He was mobilized fully and was discharged home on one-liter oxygen via nasal cannula with outpatient follow-up.



**Figure 3:** Chest X-ray post right-sided tube thoracostomy.



**Figure 4:** Chest X-ray after removal of chest tube.

## Discussion

Coronavirus disease 2019 infection is a severe and pandemic global infection spread in many countries, including Pakistan. It affects mainly the lung due to its access smoothly to cells through the angiotensin-converting enzyme. These two receptors are present commonly in type II alveolar cells in the lung [3]. Pneumothorax can be developed with primary or secondary spontaneous causes. It occurs mainly in patients with a history of smoking, COPD, pneumonia, or inpatient mechanical ventilation with pre-existing lung disease. In this case, spontaneous pneumothorax was developed after 20 days of admission during the hospital stay. The patient requirement of  $fiO_2$  was increasing gradually with increasing density of bilateral lung infiltrates since hospital admission. Weiyi, *et al.* had a 62-year-old man who developed of pneumothorax after about 20 days of admission for COVID-19 infection [5]. Luke flower, *et al.* study in which a 36-year-old man was diagnosed with tension pneumothorax of 4-hour duration following a 3-week history of cough, fevers, and dyspnoea with positive PCR for COVID-19 infection [7]. Fahad, *et al.* described a case report in which a fifty-six-year-old male patient with covid-19 infection developed right-sided pneumothorax on 21-day admission [10]. Burcin, *et al.* and Suphi, *et al.* case reports, both patients were present with spontaneous pneumothorax in addition to other features of COVID-19 infection initially [3,4].

Here, there are no identified risk factors for developing a pneumothorax. Same as with Sharma, *et al.* case of severe pneumothorax and pneumoperitoneum in a non-ventilated patient like other reported cases [4,5,10,11].

## Conclusion

Coronavirus disease 2019 infection may be complicated with spontaneous pneumothorax after a period of initial symptoms (delayed pneumothorax). Pneumothorax is an important differential for acute deterioration of covid-19 besides pulmonary embolism later in the acute phase. Positive airway pressure may worsen pneumothorax, which clinicians need to be on lookout for. Pneumothorax in these patients if treated promptly has no bearing on clinical outcome.

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