



(CASE REPORT)



## Bilateral pneumothorax following COVID- 19

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### Abstract

Risk factors for pneumothorax include male sex, height, smoking and underlying lung conditions. The reported causes of bilateral pneumothorax include trauma, tumor, and iatrogenic causes. Complications of pneumothorax include Respiratory failure or arrest, Pneumoperitoneum, Pyopneumothorax, Pneumohemothorax, Pneumopericardium, Bronchopulmonary fistula, damage to the neurovascular bundle during tube thoracostomy and pain and skin infection at the site of tube thoracostomy. Pneumothorax is rather rare complication of pneumonia associated with SARS COV-2. Herein, we described a COVID-19 patient who presented with breathlessness and chest pain which turned out is bilateral pneumothorax.

**Keywords:** Bilateral Pneumothorax; SARS-COV 2; COVID- 19; Intercostal Drainage

### 1. Introduction

Pneumothorax can be defined as a collection of air inside the pleural cavity between the parietal and visceral pleura. Simultaneous spontaneous bilateral tension pneumothorax occurs when no tracheal shift occurs and the degree of bilaterally lung collapse is similar in a chest X-ray. Patients with simultaneously developed bilateral tension pneumothorax may deteriorate rapidly, and immediate decompression is recommended. Reported risk factors for pneumothorax include male sex, height, smoking and underlying lung conditions. Increased incidence occurs in Human immunodeficiency virus infection (HIV) patients with underlying pneumocystis carinii infection. The documented causes of bilateral pneumothorax include trauma, tumor, and iatrogenic causes [1-3]. Other rare causes include catamenial pneumothorax, sarcoidosis, pregnancy, and radiation [4]. Pneumothorax is a rare but life-threatening complication associated with COVID pneumonia.

### 2. Case report

**Table 1** Arterial blood gas at that time

<b>pH</b>	7.47	7.48
<b>pCO<sub>2</sub></b>	45	46
<b>pO<sub>2</sub></b>	64	173
<b>HCO<sub>3</sub></b>	32.8	34.3
<b>TCO<sub>2</sub></b>	34.2	35.7
<b>SO<sub>2</sub></b>	93	100

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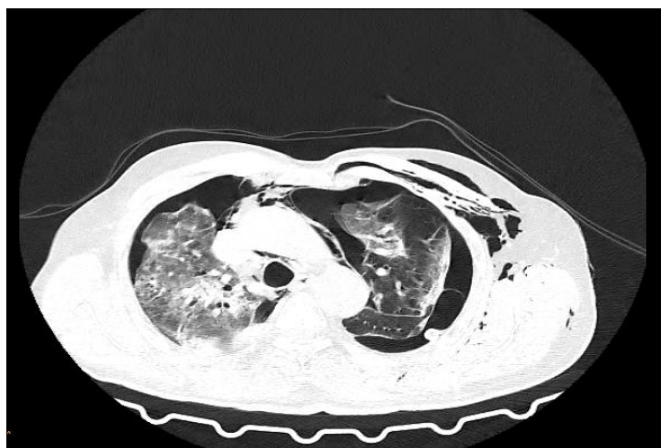


**Figure 1** Chest X-ray showing bilateral pneumothorax

58 years old male was admitted to Intensive care unit presented with complaints of breathlessness and chest pain for 2 days. The patient was afebrile, breath sounds present bilaterally and oxygen saturation was 96% on 4 litre oxygen per minutes.

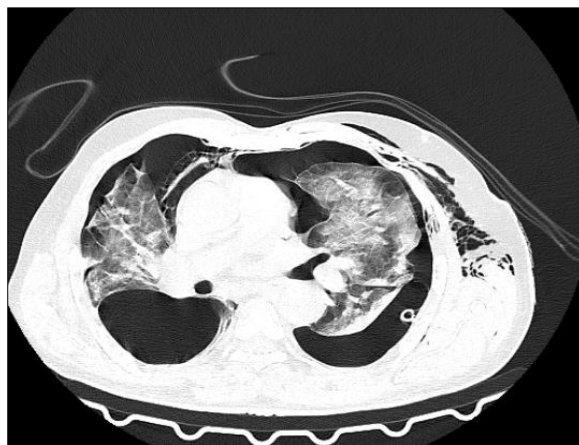
### 3. CT thorax

Left chest drain tube in situ. Large volume left pneumothorax with fluid level –Hydropneumothorax. Mediastinal shift to right side and mild flattening of left hemidiaphragm noted - ? Tension pneumothorax. Diffuse subcutaneous emphysema in the left chest wall. Small volume pneumothorax in right side. Encysted pneumothorax in right side between middle and lower lobes. Diffuse ground glass opacities and early consolidation changes seen bilaterally – Secondary to Covid -19 infection - Moderate to severe (Fig 2 and 3).



**Figure 2** CT scan showing bilateral pneumothorax

He was diagnosed as recurrent pneumothorax- left side, Minimal pneumothorax- right side. Bilateral lung lesion, Respiratory failure and Post covid 25/6/2021. Intercostal drainage tube was introduced on the left side. The patient was treated with bilateral chest tube insertion and the X-ray showed a successful re-expansion of both lungs. Intercostal drainage tube removed on 10/7/2021. Patient was discharged with metered dose inhaler and nocturnal oxygen therapy.



**Figure 3** CT scan showing bilateral pneumothorax with ICD tube in-situ on left side



**Figure 4-** Chest X-ray after 3 months

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#### 4. Discussion

The incidence of pneumothorax is still not yet exactly known. In a report by Chen et al. 1% (one patient) had a pneumothorax among other radiographic features [7]. In a study published by Yang and colleagues in 92 deceased COVID-19 patients, one (1.1%) had a pneumothorax and died as a result of it 5 days after the initial presentation [8]. A pneumothorax has also been linked to poor prognosis in patients infected with the acute Middle East respiratory syndrome corona-virus (MERS-CoV) [9 and 10].

Although most patients with COVID-19 manifest as viral pneumonia characterized by symptoms such as fever, dyspnea, and cough, atypical presentations such as acute respiratory distress syndrome (ARDS) and acute kidney or cardiac injury have been reported amongst COVID-19 patients. Bilateral and peripheral ground-glass and opacities are the hallmarks of COVID-19 infection on imaging exams.

The reported causes of bilateral pneumothorax include trauma, tumor, and iatrogenic causes [1-3]. Other more rare causes have been reported, including catamenial pneumothorax, sarcoidosis, pregnancy, and radiation [4]. As per Muhammad AI, Pneumothorax as a complication in COVID-19 has been reported in 1% of patients in 2 case series (1/91 and 1/99 patients), however it's not clear if they were spontaneous or post mechanical ventilation. As per Alan et al. [5] reported 6 cases of SARS complicated by pneumothorax, and 3 of 6 cases were bilateral.

The treatment of bilateral pneumothorax requires definitive surgical therapy to reduce the risk of recurrence [2 and 6]. This can be done either through VATS or open thoracotomy, depending on the surgeon's preference. Mechanical pleurodesis should be performed to reduce the recurrence rate.

In the present study, intercostal drainage was done on left side. On the other side both pneumatocele as well as pneumothorax were present which were managed conservatively with high flow oxygen and other supportive measures. Chest x-ray after ICD removal showed resolution. Repeat chest X-ray after 3 months showed complete resolution of pneumothorax (Fig 4).

Complications of pneumothorax include Respiratory failure or arrest, Cardiac arrest, Empyema, Pyopneumothorax, Expansion pulmonary edema, Pneumohemothorax, Pneumopericardium, Pneumoperitoneum, Bronchopulmonary fistula, Damage to the neurovascular bundle during tube thoracostomy and Pain and skin infection at the site of tube thoracostomy. In our study, no complications including empyema and re-expansion pulmonary edema were noted due to timely diagnosis and interventions.

### *Abbreviations*

- COVID-19 - Corona virus disease 19.
- ICD – Intercostal drainage.
- SARS-COV 2 - severe acute respiratory syndrome coronavirus 2.

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## **5. Conclusion**

Pneumothorax occurs as rare complication SARS-COV 2 pneumonias. Even though it is life-threatening, timely diagnosis and active interventions often help to avoid many complications. This in turn prevents morbidity as well as mortality.

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## **Compliance with ethical standards**

### *Disclosure of conflict of interest*

No conflict of interest.

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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## **References**

- [1] Lee SC, Cheng YI, Huang CW, Tzao C, Hsu HH, Chang H. Simultaneous bilateral primary spontaneous pneumothorax. *Respirology*. Jan 2008; 13(1): 145-8.
- [2] Rivas de Andrés JJ, Jiménez López MF, MolinsLópez-Rodó L, et al. Guideline for the diagnosis and treatment of spontaneous pneumothorax. *Arch Bronconeumol*. 2008; 44: 437-448.
- [3] Kim ES, Sohn ST, Kang JY. Simultaneous bilateral spontaneous pneumothorax. *Journal of Chest Surgery*. 2006; 39(6): 475-8.
- [4] Shields TW, editor. *General thoracic surgery*. Lippincott Williams & Wilkins. 2005.
- [5] Muhammad AI, Boynton EJ, Naureen S. COVID-19 with bilateral pneumothoraces-case report. *Respiratory Medicine Case Reports*. 1 Jan 2020; 31: 101254.
- [6] Sihoe AD, Wong RH, Lee AT, Lau LS, Leung NY, Law KI, Yim AP. Severe acute respiratory syndrome complicated by spontaneous pneumothorax. *Chest*. 1 Jun 2004; 125(6): 2345-51.
- [7] Lewis LR. Simultaneous bilateral spontaneous pneumothorax: a case report. *Curr Surg*. 2002; 59: 99-100.
- [8] Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, Qiu Y, Wang J, Liu Y, Wei Y, Yu T. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *The Lancet*. 15 Feb 2020; 395(10223): 507-13.
- [9] Yang F, Shi S, Zhu J, Shi J, Dai K, Chen X. Analysis of 92 deceased patients with COVID-19. *Journal of medical virology*. Nov 2020; 92(11): 2511-5.
- [10] Das KM, Lee EY, Jawder SE, Enani MA, Singh R, Skakni L, Al-Nakshabandi N, AlDossari K, Larsson SG. Acute Middle East respiratory syndrome coronavirus: temporal lung changes observed on the chest radiographs of 55 patients. *American Journal of Roentgenology*. Sep 2015; 205(3): W267-S274.