Case report

Recurrent pneumothorax in a COVID-19 patient: A case report

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ABSTRACT

An 88-year-old woman diagnosed with COVID-19 in Brazil presented with recurrent pneumothorax. She was under mechanical ventilation for 20 days because of acute respiratory distress syndrome (ARDS). Chest x-ray revealed right lung pneumothorax, which was treated with a pigtail chest tube leading to successful lung reexpansion. After 48 hours the patient developed an ipsilateral pneumothorax and a new tube thoracostomy under conventional chest tube under suction was performed and kept in place for 14 days.

This brief report highlights that the conventional chest tube under suction procedures might be a good choice in Covid-19 patients.

1. Introduction

Recently, a cluster of atypical pneumonia originated in Wuhan, China, with the first known case recorded on December 1st, 2019. On March 11th, 2020, the World Health Organization (WHO) declared the outbreak of COVID-19 as a pandemic [1,2]. The first case in Brazil was confirmed on February 26th, 2020, and since then the country has seen an exponential increase in case numbers. The symptoms vary in intensity and severity, from asymptomatic to lethal cases, leading to different outcomes [2]. To date, there have been few reports of pneumothorax as a complication associated with COVID-19. We report a case in which the patient presented a recurrent pneumothorax treated with conventional chest tube under suction.

2. Results

An 88-year-old woman diagnosed with COVID-19 at a hospital in São Paulo - the epicenter of the COVID-19 outbreak in Brazil – was put under mechanical ventilation for 20 days due to acute respiratory distress syndrome (ARDS). Chest x-ray revealed right lung pneumothorax, which was treated with a pigtail chest tube leading to successful lung reexpansion. After 48 hours the patient developed an ipsilateral pneumothorax and a new tube thoracostomy under conventional chest tube under suction was performed and kept in place for 14 days.

This brief report highlights that the conventional chest tube under suction procedures might be a good choice in Covid-19 patients.

3. Discussion

Recent studies suggest that pneumothorax is a rare complication,
found in 1–2% of COVID-19 patients with a mean time occurrence of 24.3 days from the hospital admission during the early phase of intubation [3, 4]. Also, reported cases have shown that spontaneous pneumomediastinum may occur in 12% of SARS patients sometimes not related to pneumothorax [5]. Mechanical ventilation associated with pulmonary fibrosis could cause pulmonary bullae. Variations on the intrapulmonary pressure could result in bullae rupture, leading to a secondary pneumothorax [6].

The patient presented high levels of leukocytes, neutrophils, and LDH, some studies have drawn a parallel between all these findings and COVID-19 pneumothoraces [5, 7]. Pneumothorax diagnosis presents clinical manifestations - especially in patients under mechanical ventilation - such as a sudden increase in dyspnea and rapid oxygen desaturation, confirmed by imaging exams [5]. Improvement on therapeutic effect and reduction in mortality can be achieved with early diagnosis and timely treatment [8]. This complication may be associated with poorer pulmonary prognosis, especially among COVID-19 patients [9].

The chest drainage, a potentially viral transmitter, offered short-term stabilization of clinical signs, ensuring adequate lung expansion [5, 10]. To avoid aerosolization from conventional chest tube, it is recommended closed drainage systems connecting the standard tube bottle to wall suction, as was used in our case [10].

We advocate the use of the conventional chest tube instead of pigtail catheter for high debt fistulae, as it minimizes aerosol and can be used under suction, which allows a faster fistulae recovery.

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**Declaration of competing interest**

The authors declare that there were no conflicts of interest regarding the article.

**References**

[1] D.N. Valencia, Brief review on COVID-19: the 2020 pandemic caused by SARS-CoV-2, Cureus 12 (3) (March 24, 2020), e7386.
[2] (WHO) World Health Organization, Western Pacific Region. Coronavirus Disease (COVID-19) Outbreak, 2020. https://www.who.int/westernpacific/emergencies/covid-19.
[3] E. Pinotti, M. Montuori, F. Carisimii, et al., Massive bilateral pneumothorax associated with COVID-19 pneumonia, Open J Clin Med Case Rep (2020) 1648.
[4] A. Aiolfi, T. Biraghi, A. Montisci, et al., Management of persistent pneumothorax with thoracoscopy and blebs resection IN COVID-19 patients, Ann. Thorac. Surg. (April 2020). In press.
[5] D.L.Sihoe Alan, H.L.Wong Randolph, Alex T.H. Lee, et al., Severe acute respiratory syndrome complicated by spontaneous pneumothorax, Chest 125 (June, 2004) 2345–2351.
[6] Ruibing Lyu, Xin Li, Diagnosis and treatment of severe COVID-19 complicated with spontaneous pneumothorax: a case report, Advanced Ultrasound in Diagnosis and Therapy 4 (2) (2020) 142–146.
[7] Gregory A. Filice, SARS, pneumothorax, and our response to epidemics, Chest 125 (6) (June 2004) 1982–1984.
[8] R. Sun, H. Liu, X. Wang, Mediastinal emphysema, giant Bulla, and pneumothorax developed during the course of COVID-19 pneumonia, Korean J. Radiol. 21 (5) (May, 2020) 541–544.

[9] Melina Hosseiny, Soheil Kooraki, Ali Gholamrezazehad, Sravanthi Reddy, Lee Myers, Radiology perspective of coronavirus disease 2019 (COVID-19): lessons from severe acute respiratory syndrome and Middle East respiratory syndrome, Am. J. Roentgenol. 214 (5) (May, 2020) 1078–1082.

[10] Hiroshi Sugimoto, Takuya Kohama, Chest tube with air leaks is a potential “super spreader” of COVID-19, American Journal of Infection Control 48 (8) (June, 2020) 969.