



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 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) caused by the SARS-CoV-2.

The patient had no history of smoking. Laboratory examination revealed a high percentage of white blood cell neutrophil count 12,870 (normal range: 1700–7000 mm³) and a decreased percentage lymphocyte count 860 (normal range: 900–2900 mm³). There were elevated blood levels for C-reactive protein 28.05 mg/L (normal range: 0–5 mg/L),

D-dimer 4.65 mg/L (normal range: < 0.5 mg/L), and Lactic Dehydrogenase (LDH) 595 U/L (normal range: 240–480 U/L). At a fraction of inspired O₂ (FiO₂) of 60%, with a PEEP of 8 mmHg under a 20 mmHg pressure support, the blood gas analysis showed pH 7.49 (normal 7.35–7.45) a PO₂ of 89 mmHg (normal 80–100 mmHg), pCO₂ of 28 mmHg (normal 35–45 mmHg) and a SatO₂ of 97% (normal 94–100%).

Suddenly, she developed oxygen desaturation (SpO₂) of 87% and a worse respiratory pattern. During physical examination, respiratory sounds were diminished at right hemithorax. The chest x-ray revealed right pneumothorax (Fig. 1-A). A pigtail catheter was introduced with successful reexpansion of the right lung (Fig. 1-B). A huge air escape was observed after the pleural drainage, which was put under a water seal with a filter protected.

Forty-eight hours after the first pneumothorax, the patient developed another respiratory distress, with an ipsilateral new pneumothorax (Fig. 1-C) requiring another chest drain with conventional 28F chest tube thoracostomy under suction, leading to improved lung reexpansion (Fig. 1-D).

The pigtail was withdrawn two days after the chest tube insertion, and the chest tube was kept in place until mechanical ventilation weaning, which occurred 14 days after the second procedure.

3. Discussion

Recent studies suggest that pneumothorax is a rare complication,

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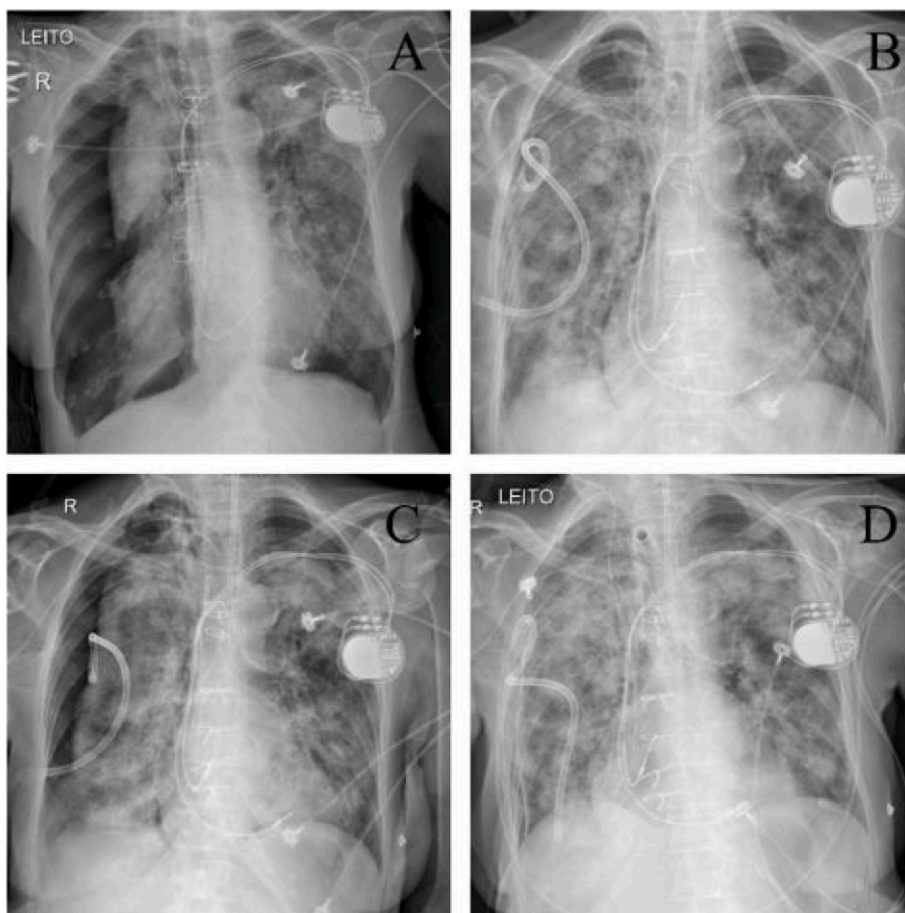


Fig. 1. Chest X-Rays of an 88-year-old woman with COVID-19

A. Chest X-Ray shows right pneumothorax B. A pigtail catheter on the right hemithorax and lung reexpansion C. recurrent ipsilateral pneumothorax D. Lung reexpansion after conventional chest tube.

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.

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