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Large emphysematous bulla after COVID 19 pneumonia

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Abstract

A 38-year-old man, with history of COVID 19 pneumonia 23 days back, non-smoker and known case of hypertension presented to the emergency department with complain of sudden onset multiple episodes of blood mixed sputum associated with shortness of breath and sharp type of left sided chest pain for last five hours. The patient was dyspneic, tachypneic and hypoxemic at the time of examination with SPO₂ of 84 to 86% without oxygen which improved to 95-96% after 15 liter/min of oxygen via high flow nasal cannula. There were no breath sounds in left hemi thorax and decreased breath sound on right side with basal crepitation. Chest radiograph revealed left sided pneumothorax, needle decompression done immediately followed by chest tube insertion and maintaining 95-96% oxygen at 8 l/m after the procedure. The patient was admitted, and HRCT revealed giant emphysematous bulla in posteromedial aspects of left lobe. This is to highlight the complications that were observed in post COVID patient.

Keywords: COVID 19, Complications, Large emphysematous bulla

Introduction

COVID-19 was first reported in Wuhan, Hubei Province, China, in December 2019. The disease is caused by SARS-CoV-2. On January 30, 2020, the WHO declared COVID-19 a global health emergency.¹ Common symptom that has been identified include fever, cough, dyspnea, headache, abdominal pain, nausea/vomiting, myalgia, diarrhea, pharyngitis, rhinorrhea, fatigue, and loss of smell and/or taste,² although some of those infected can be asymptomatic. A percentage of patients develop severe forms, along with severe complications like respiratory failure/acute respiratory distress syndrome, pulmonary fibrosis, arrhythmias, acute cardiac injury, shock, thromboembolic events, and inflammatory complications.³ Spontaneous pneumothorax (SP) is a rare complication of COVID-19 pneumonia, with an incidence of less than 1‰ according to the current literature,⁴ suggesting that pneumothorax is either uncommon or underreported in patients with COVID-19.⁵ In this report, we discuss a case involving a spontaneous pneumothorax that developed 23 days after clinical recovery from COVID-19 pneumonia.

Case Report

On 4 June 2021, 38-year-old male residing in Banasthali, Kathmandu, Nepal presented to the emergency department of Patan Hospital with the multiple episodes of blood mixed sputum approximately 20-22 episodes in the last five hours, and shortness of breath even at rest associated with diffuse left-sided chest pain during coughing, deep inspiration and feeling of chest tightness along with awareness of increased heartbeat, saturation dropped to 82% followed by the symptoms of hemoptysis. The nature of the cough was loud, persistent, and repeated coughing till blood mixed sputum comes out.

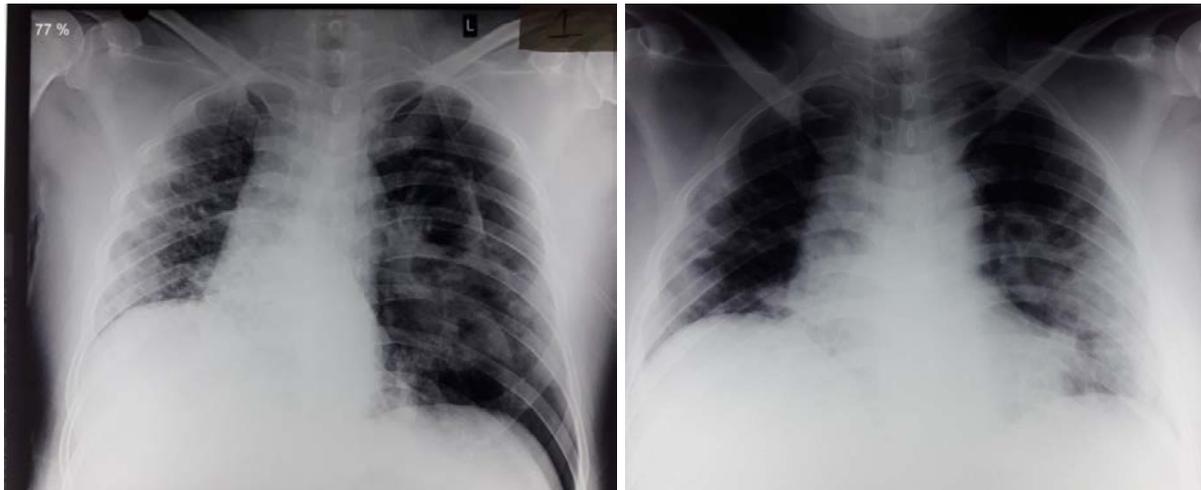
The sputum was tested positive in a real-time polymerase chain reaction for SARS CoV-2 on

25 May 2021 when he had symptoms of high-grade fever of 102 degrees Fahrenheit and dry cough for a day. The patient stayed in home isolation and noticed blood mixed sputum on the 4th day of positive Polymerase Chain Reaction (PCR) test, persistent fever along with SPO₂ of 82% then the patient was admitted to Patan Hospital with the diagnosis of Moderate COVID pneumonia. Fever resolved on the day of admission and hemoptysis lasted for four more days requiring a maximum of 10 L of Oxygen (O₂) via a face mask to maintain a saturation of 97%. As the patient improved over one week maintaining saturation of 95% at room air patient was discharged home. His medical history was significant with hypertension for five years under medication and occasional alcohol consumption three days/week for the last 10 y. There was no history of previous chest symptoms or hospital admissions. There was no history of recreational drug uses marijuana smoking or use of BiPAP during COVID infections.

On presentation, the patient was conscious, oriented to time, place, and person, tachypneic with signs of respiratory distress, and unable to complete the sentences because of dyspnoea. He was significantly hypoxemic with an SPO₂ of 84-86% without O₂ and required 15 L/min via a high flow nasal cannula to maintain the arterial saturation (SPO₂) of 96% with a regular heart rate of 110 beats/min and blood pressure of 120/80 mmHg. The trachea was placed centrally and asymmetrical chest expansion was noted. There was hyper resonant sound on percussion and auscultation absent air entry on the left side with decreased air entry on the right basal region with crepitation.

Investigations

The chest radiograph was obtained demonstrating the hyperlucency of lungs on the left side along with patchy consolidations in the bilateral peripheral region reflecting the past COVID pneumonia and pneumothorax in the current situation.



**Figure 1. Chest X-ray demonstrating left-sided pneumothorax with bilateral lungs consolidations (Right)
Figure 2. lung expansion after chest tube insertion and bilateral lung consolidation (Left)**

Table 1. Lab reports of the reported case with large emphysematous bulla after COVID-19 pneumonia

Total Leukocyte	11.2 thousand/microlitre, N76L21E03
Hemoglobin/Hematocrit	16.2 mg/dl / 50 %
Platelets	2,75,000
PT/INR	15.3 / 1.09
Urea/Creatinine	13/0.7 mg/dl
Sodium/Potassium	137/4.1meq/l
ABG	Ph:7.47, P _{CO2} :30.3mmhg, Hco ₃ ⁻ :21.5, PO ₂ : 72.4 mmhg
CRP/ESR/LDH/SGPT/Ferritin	6.1mg/dl / 38mm/hr / 413 U/L 37 U/L / 609 ng/ml

Two days later High-Resolution Computed Tomography (HRCT) chest was done revealing features of post-COVID pneumonia lung fibrosis in the bilateral lower lobe of lungs and peripheral in distribution, giant emphysematous bulla (11.7x6.2x5.3 cm) in left posteromedial lower lobe with associated segmental/sub-segmental atelectasis, mediastinal lymphadenopathy largest measuring 1.2 cm and chest tube insertion through 6th intercostal space traversing

through the left lung and its tip positioned likely at the anterior aspect of the pericardial fat plane in left side/left pectoralis minor muscle.

A comparison of CT scan done 20 d back revealed mild to moderate COVID changes with bilateral ground-glass opacities in bilateral lungs and no emphysematous bulla or pneumothorax.



Figure 3. HRCT scan done 20 days back showing distortion of bilateral lung parenchyma with multiple ground-glass opacities peripheral in distribution suggesting COVID-19 changes

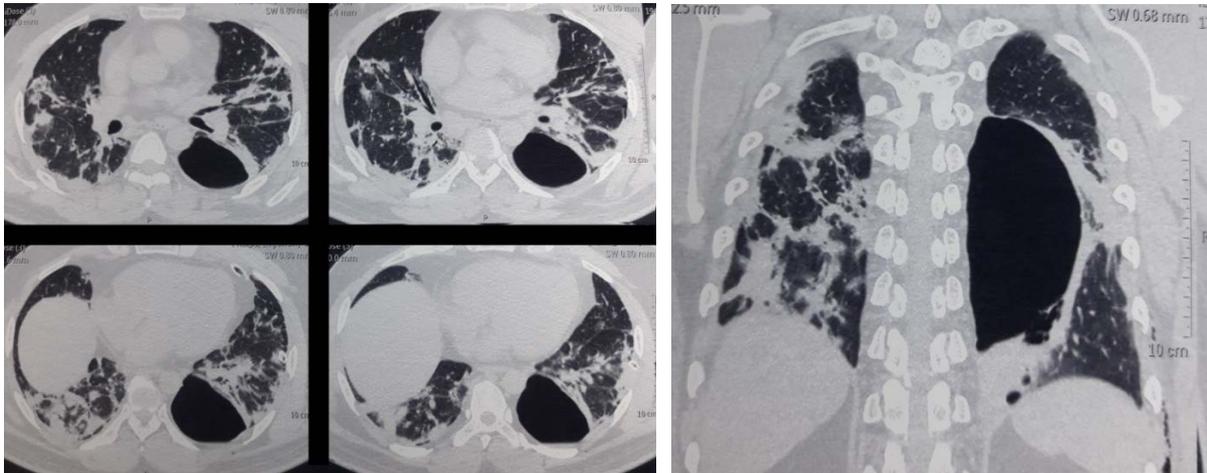


Figure 4. HRCT- architectural distortion of bilateral lung, multifocal-multilobar reticulations, linear fibrotic bands with traction bronchiectasis bilateral lower lobe, giant emphysematous bulla in left lower lobe

Treatment

As per the clinical and radiological findings, the diagnosis of pneumothorax was made and immediate emergency needle decompression was done with a 20 G cannula placed in the left 2nd intercostal space in the midclavicular line. Following this chest tube drain was inserted through the left side of the chest safety triangle and fixed at 12 cm. Post-procedure improvement was noted with relieving signs of respiratory distress, resolving tachypnea, and SPO₂ maintained at 96% at 8 L of O₂ via face mask and pulse rate of 80-85/min.

The patient was treated with tablet codeine 30 mg oral eight hourly for cough and analgesics were used. After HRCT, on day 4 of hospital admission, the chest tube was adjusted and fixed at 9 cm. The chest tube was clamped on the same day for four hours, the patient was stable and we could see radiologically inflated lungs. Also, the cardiothoracic vascular surgeon was consulted for bullectomy or Video-assisted thoracoscopic surgery (VATS) guided pleurodesis, both were not required for the patient currently as the patient was stable. So, according to the consultation chest tube was removed on day 7 of insertion, the patient improved, had no hemoptysis and was

maintaining saturation of 96% at room air, and was discharged home. The patient was advised to follow up with HRCT reports seeing if the bulla is static or increasing so accordingly further treatment would be planned.

Discussion

Chest CT is a reliable investigation for the characterization of lung lesions caused by SARS-CoV-2 infection. Among the most characteristic findings are ground-glass opacities, consolidated opacities, and septa thickening.⁶ This is a rare case presenting with the pneumothorax and large emphysematous bulla as a complication of COVID-19. This would somehow help the clinicians with this complication related to COVID-19 and further management.

The patient here presented with severe cough and hemoptysis followed by shortness of breath and left-sided chest pain. One possible mechanism to explain this would be secondary to alveolar damage from the infection and a rupture of the alveolar wall due to increased pressure from pronounced coughing that occurred.⁷ Also the risk factors for pneumothorax such as BiPAP use during COVID-19 pneumonia, and smoking history is not present in this patient. Though few cases of delayed spontaneous pneumothorax in the post-recovery state of COVID-19 have been reported.⁸⁻¹⁰

Clinicians need to be alert for early diagnosis and treatment for such complications in COVID-19 infections.

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Conflict of Interest

None

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Author Contribution

Concept, design, planning- DJ, RM; Literature review- RM; Data collection/analysis-JS, RM, DJ; Draft manuscript-JS; Revision of draft DJ, RM; Final manuscript- DJ, RM; Accountability of the work-DJ, RM, JS.

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