Secondary pneumothorax in COVID 19 Pneumonia: A rare complication


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ABSTRACT
Background-
Coronavirus pneumonia is an infectious disease caused by SARS-CoV-2 virus. It mainly affects the lungs and common symptoms are fever, cough and shortness of breath. Patients are known to have sudden deterioration with multiple causes.

Case presentation-
64 year old man without comorbidities diagnosed with covid 19 pneumonia was admitted in SARI ward. After two days of admission he developed sudden deterioration with tachypnoea and tachycardia and increase in oxygen requirement. Chest x ray revealed right sided pneumothorax. Patient was treated with immediate needle decompression followed by intercostal drain.

Conclusion-
With broad spectrum of disorders causing acute deterioration in the patients of covid 19 pneumonia, considering pneumothorax as a differential diagnosis is must.

Keywords: covid 19, atypical pneumonia, pneumothorax

INTRODUCTION
In early December 2019, the first pneumonia cases of unknown origin were identified in Wuhan, the capital city of Hubei province. The pathogen has been identified as a novel enveloped RNA betacoronavirus that has currently been named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which has a phylogenetic similarity to SARS-CoV.[1] COVID-19 is known for causing type 1 respiratory failure, thrombotic complications, myocardial dysfunction and arrhythmia, acute coronary syndromes, acute kidney injury, gastrointestinal symptoms, hepatic cellular injury, hyperglycaemia and ketosis, neurologic illnesses, ocular symptoms, and dermatologic complications.[2]

In this case, we describe a patient with suspected underlying COVID 19 pneumonia presenting with a tension pneumothorax. While continuous positive airway pressure (CPAP) would have been indicated given the clinical picture and onset of the patient’s symptoms, applying such protocol driven treatment in the patients of pneumothorax would likely have resulted in further deterioration.

Clinical history
64 year old man presented with complaints of dry cough, mild fever and malaise from 3 days. Patient didn’t have any significant medical history. Patient was a non-smoker and non-alcoholic and there was no history of substance abuse. On examination his
vitals were normal. Respiratory examination revealed bilateral crepitus with in the lower zones of chest and equal air entry on all areas of chest on initial presentation. With the saturation of 80% on room air he was admitted in SARI ward for oxygen and medical therapy. His initial chest X-ray PA view revealed bilateral heterogeneous opacity (Figure 1). RT PCR test was done on the throat swab for covid 19 which was positive. He was treated for covid 19 pneumonia as per the standard treatment guidelines. There was clinical improvement with decrease in fever and tachypnoea. During the course in the hospital, after three days patient had sudden onset desaturation in blood oxygen level and became tachypnoeic with the respiratory rate of 36 cycles per minute and tachycardia with heart rate of 128 beats per minute. Clinical examination and chest X-ray revealed right sided pneumothorax (Figure 2). It was treated with emergency needle decompression, followed by chest drain insertion.

Investigations:
A portable PA view chest radiograph was performed demonstrating a large right-sided pneumothorax (figure 2). The right lung while compressed and left lung displayed signs of severe COVID-19, that is, widespread patchy consolidative changes. His blood investigation revealed hemoglobin of 13.9 g/dl, haematocrit of 46 %, and total leucocyte count of 8750/micro litre. Differential leucocyte count revealed 95.5 % of neutrophils and 3.5% of lymphocytes. Biochemical markers were in normal limits.

Treatment
On review of chest X-ray, the patient was treated with immediate emergency needle decompression of his pneumothorax with a 14-gauge needle inserted in the second rib space along the mid clavicular line. Following initial decompression, he was treated with intercostal drainage tube placed in 5th intercostal space along the mid axillary line. Patient was treated according to the standard guidelines.

Outcome and follow up-
Emergency intercostal drainage resulted in immediate improvement in respiratory and cardiovascular physiology with evidence of lung re-expansion (Figure 3). Patient’s oxygen requirement reduced significantly. Intercostal drainage tube was removed after 3 days after consulting cardiothoracic surgeon. Patient was discharged according to the standard discharge protocol after completion of treatment.

Discussion
This case introduces the consideration of secondary tension pneumothorax as cause of acute deterioration in patients with underlying SARS-CoV2 infection.

Pneumothorax is an urgent situation that has to be treated immediately upon diagnosis. Pneumothorax is divided to primary and secondary. A primary pneumothorax is considered the one that occurs without an apparent cause and in the absence of significant lung disease. On the other hand secondary pneumothorax occurs in the presence of existing lung pathology. There is the case where an amount of air in the chest increases markedly and a one-way valve is formed leading to a tension pneumothorax. Unless reversed by effective treatment, this situation can progress and cause death. Tension pneumothorax is usually treated with urgent needle decompression. A chest tube (or intercostal drain) is the most definitive initial treatment of a pneumothorax. [3]

Myocarditis, acute myocardial infarction, acute pulmonary thromboembolisms, ARDS have been reported as a cause of acute deterioration in the cases of SARS-CoV2 infection. High mortality rate is associated with acute myocardial infarction, acute myocarditis, and rapid onset of heart failure.[4,5]

Clear impacts of COVID-19 on acute myocardial infarction (AMI) including STEMI and NSTEMI have also been noted in recent protocols of AMI[6,7].

This case further highlights the difficulties facing emergency department clinicians amidst the current pandemic. With broad spectrum of disorders causing acute deterioration in the patients of covid 19 pneumonia, considering pneumothorax as a differential diagnosis is must. Early reorganization of the cause of acute deterioration and treating the particular cause leads to better outcome of the patient.
Figure 1: Initial chest x-ray revealing bilateral heterogenous opacities
Figure 2: Chest x-ray revealing right sided pneumothorax
Figure 3: Chest x-ray showing expansion of the lung fields with inter-coastal tube in-situ

Bibliography


