



Case Report

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## Pneumomediastinum in Covid 19 infection-A rare complication

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### **Abstract**

*Covid-19 is caused by severe acute respiratory syndrome Corona virus-2; which is characterized by variable clinical presentation. It can present as asymptomatic phase to severe acute respiratory distress syndrome (ARDS). The radiological diagnosis can be achieved by using chest x-ray or computed tomography of thorax. The typical radiographic findings in COVID-19 include bilateral ground-glass opacities and/or consolidations predominantly affecting the lower lobes and posterior segments of lungs. Other rare abnormal radiographic findings include pneumothorax, pneumomediastinum and pneumopericardium. The pneumomediastinum is a rare but life-threatening complication which can occur either primarily or secondarily. We reported 2 cases of pneumomediastinum presenting as complication of Covid-19 infection.*

**Keywords-** *Pneumomediastinum, Covid 19, Complication.*

## Introduction

The covid-19 pandemic which was started in December 2019 has created havoc all over the world and challenged physicians all over the world. The covid-19 has diverse presentation from asymptomatic phase of disease to the fatal hypoxic failure. Many patients particularly from intensive care unit subsequently develops life threatening complication. These complications can occur as a result of multi-systemic involvement like cardiac, renal, neurological, endocrinological and can be fatal. The pneumomediastinum is one of the rare complications which can be life threatening for the patients. We reported 2 cases of pneumomediastinum occurring in Covid 19 pneumonia infection.

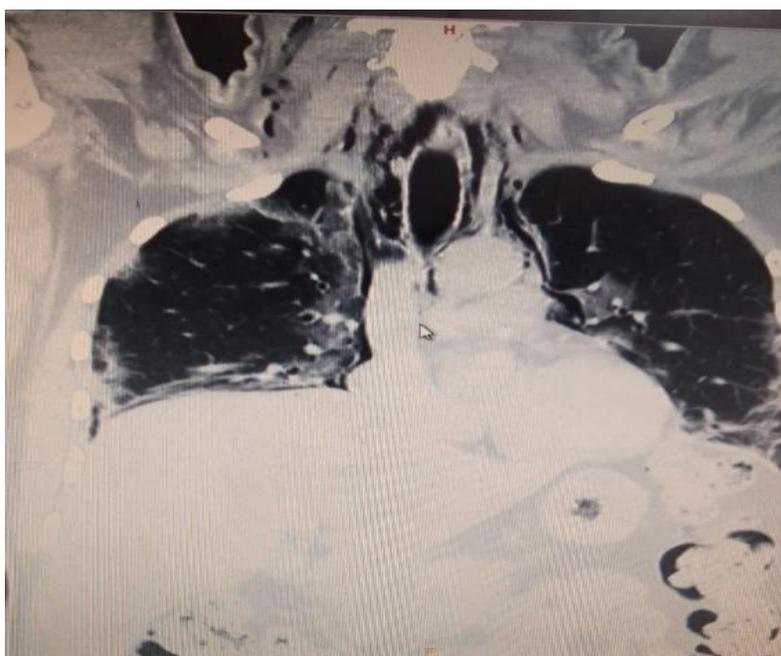
## Case reports

### Case 1

39-year male with diabetes mellitus referred in intensive care unit (ICU) in view of increased breathlessness, patient had taken 5 doses of injection Remdesivir in previous hospital. Initially he has been evaluated with reverse transcriptase-polymerase chain reaction(RT-PCR) for Covid-19 which was positive and computed tomography(CT) of thorax was suggestive of bilateral ground glass opacities predominantly in both lower lobes with CT severity score was 17/25. On admission in ICU he was evaluated with complete hemogram showing Hemoglobin of 14.4 gm/dl, Total leucocyte count was 10,000/mm<sup>3</sup> with platelet count of 2,34,000/mm<sup>3</sup>. The D-Dimer value was 8435 ng/ml and C-reactive protein being 4.6 mg/l. Patient was requiring oxygen support of 10 litres/min with non-reservoir bag and mask with anticoagulants, Antibiotics and Zinc and vitamin C supplementation as per standard doses. Patient was also treated with injectable steroids methyl-prednisolone at the dose of 1 mg/kg. Subsequently patient was shifted to ward as he was clinically better. In view of persistent cough, he was again evaluated with CT thorax which was suggestive of pneumomediastinum (**Figure 1a &1b**) and sputum culture and sensitivity was suggestive of Klebsiella pneumoniae infection. Patient was managed conservatively with oxygen support and nebulized antibiotics in the form of colistin and showed good clinical improvement. Later on, patient was discharged at home.



**Figure 1a: Pneumomediastinum in Transverse Section**



**Figure 1b: Pneumomediastinum in coronal section**

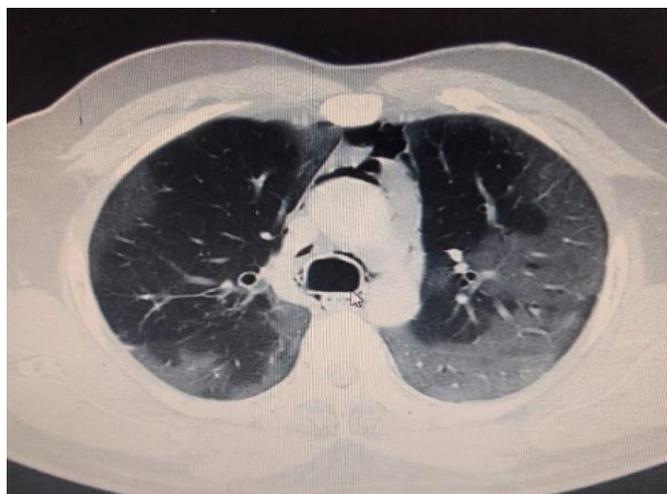
## Case 2

40 year male presented in ICU in view of increased breathlessness with initial CT thorax suggestive of Bilateral Lower lobe ground glass opacities with CT Severity score for Covid-19 being 17/25. Patient was evaluated with Chest Xray, complete blood hemogram, liver function test, renal function test, D-Dimer, C-reactive protein. Patient was started on injection Remdesivir, anticoagulant, steroid therapy for short course and higher antibiotics with zinc and vitamin C supplementation. Patient was started on non

invasive ventilation with 70% Fio<sub>2</sub>(fraction of inspired oxygen) with pressures of 6 for target saturation of 90-95%. After 7 days of admission in ICU patient improved clinically and later on shifted to ward. Subsequently patient was having persistent cough and evaluated with CT thorax again which was suggestive of pneumomediastinum (Figure 2a&2b) of patchy lower lobe ground glass opacities with CT severity score of 4/25. Subsequently patient showed good clinical improvement and discharged home.



**Figure 2a: Pneumomediastinum in coronal section**



**Figure 2b: Pneumomediastinum in transverse section**

## Discussion

Since December 2019, the Covid-19 disease has created havoc all over the world and almost affected each and every country of the world. The Covid-19 has variable presentation from asymptomatic phase to severe critical illness of acute respiratory distress. The radiological investigation like Chest X-ray or computed tomography of thorax plays an important role in diagnosis of the disease. The classical radiological presentation of the disease is bilateral ground-glass opacities and/or consolidations with peripheral/subpleural distribution, predominantly affecting the lower lobes and posterior segments of the lungs. Other atypical CT signs appear in the form of pseudonodular condensations, sometimes accompanied by inverted halo sign[1,2].

Along with these radiological signs, rare amount of patients have also reported pneumothorax, pneumomediastinum (PM), subcutaneous emphysema as a delayed complication of Covid-19 disease which is either spontaneous or secondarily to positive pressure ventilation. A prior literature study showed pneumothorax has been observed in 1% of Covid-19 patients[3]

Spontaneous pneumomediastinum is rare in SARS-CoV-2 lung infection. Only 3 cases were reported to date[4–6]. It is characterized by the presence of air in the mediastinal

structures with no apparent cause. Out of the 2 cases reported by us, first case has no apparent cause for the development of pneumomediastinum as he did not receive any positive pressure as in second case.

Kangas-Dick et al.[7] reported PM in 10% of the intubated patients with COVID-19. Similar reports of increased incidence of PM as well as pneumothorax was reported during SARS pandemic in 2003[8] Pneumopericardium is further rare, and very few cases are reported in association with COVID-19. [9-11]

Spontaneous pneumomediastinum is a rare condition, most commonly caused by underlying lung diseases like asthma, chronic lung disease, infections and mechanical ventilation. Our both the reported cases did not have any such underlying lung disease. Only second case has received positive pressure in the form of non-invasive ventilation.

While most cases are self-limited and managed conservatively but it can cause severe cardio-respiratory failure. The spontaneous pneumomediastinum is usually uncommon in viral pneumonias. Although exact mechanism is unknown, increased alveolar pressure and diffuse alveolar injury in severe COVID-19 pneumonia is common which may make the alveoli more prone to rupturing, especially as patients often have pronounced cough.

## Conclusion

The pneumomediastinum is a very rare and uncommon complication in Covid-19 infection. In most of the cases it occurs secondary to underlying condition. However it can occur itself as a complication of Covid-19 infection also.

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