

# COVID-19 with pulmonary tuberculosis with unilateral hydropneumothorax: case report from a primary care center in Bangladesh

## Abstract

Coronavirus disease 2019 (COVID-19), the latest global pandemic has already presented with a diverse range of complications. Hydropneumothorax has been a rarer one and has been observed without preexisting lung disease and mechanical ventilation. On the other hand, Pulmonary Tuberculosis is a well-established cause of hydropneumothorax. Historically, corona viral illness had been observed to be complicated with pneumothorax and coinfection with tuberculosis. This case report enumerates concurrent tuberculosis and COVID-19 and their common grave consequence hydropneumothorax.

**Keywords:** COVID-19, tuberculosis, hydropneumothorax, SARS-COV-2, pneumothorax

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**Abbreviations:** COVID-19, coronavirus disease 2019; TB, tuberculosis; AFB, acid fast bacilli

## Introduction

In endemic regions like Bangladesh, where Tuberculosis prevalence is high, it is not surprising to have tuberculosis (TB), coronavirus disease (COVID-19) co-infection during the global outbreak of SARS-COV-2. Hydropneumothorax is a least reported complication of COVID-19 and unfortunately both can simulate each other as having a common symptom of breathlessness. It is estimated that approximately 1% of hospitalized patients with COVID-19 develop pneumothorax.<sup>1</sup> On the other hand, hydropneumothorax secondary to TB usually occurs after extensive tubercular involvement followed by sudden broncho pleural fistulization presence of all these three conditions are seldom found together and we would like to share these co-occurrences in a diabetic patient and its consequences.

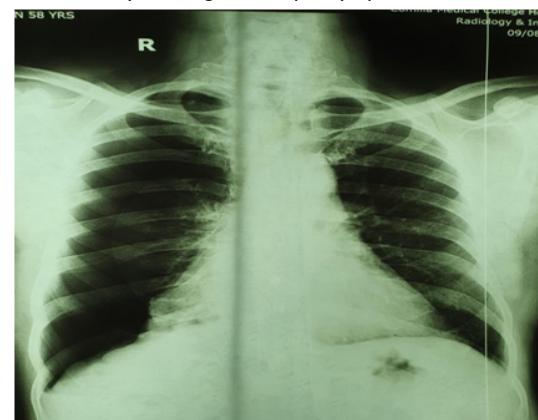
## Case report

A 58 years old diabetic patient initially presented to Fever Clinic of Debidwar UHC with non-productive cough for 2 months & recent onset of high grade fever for 4 days. He was tested positive for SARS-CoV-2 by RT-PCR. Following conservative management though initially a bit symptomatically improved, the cough was persisting & a few days later he again experienced low grade fever, productive, distressing cough and dyspnoea. However keeping in mind his history of chronic cough and low grade fever and looking at his chest radiograph, sputum for Acid fast Bacilli (AFB) and Gene Xpert was advised and it came positive with Rifampicin sensitivity. Standard anti TB chemotherapy was started Figure 1. After 10 days of anti-TB chemotherapy, he developed severe breathlessness and immediately a chest radiograph was performed which was suggestive of right sided pneumothorax Figure 2. He was immediately referred to higher center. Urgent tube thoracostomy was done. As per routine procedure, RT-PCR for SARS-COV-2 was done and he again tested positive. He was treated with insulin, enoxaparin, standard anti TB chemotherapy and broad spectrum antimicrobials. But symptoms were persisting, there was new collection of straw colored fluid in water seal drain and again a chest X ray was performed and was suggestive of right sided hydropneumothorax. Figure 3 Pleural fluid study was done and was

suggestive of tubercular pleural effusion. Results of other baseline investigations are shown in Table 1. As symptoms were persisting, a CT scan chest was performed and revealed lobar consolidation with pleural thickening and encysted hydropneumothorax right side, tiny lung nodule in right side and fibrosis with traction bronchiectasis in left side Figure 4. Patient was advised for decortication with right lower lobectomy. But, unfortunately surgery was delayed as patient was unfit for surgery and conservative treatment was pursued.



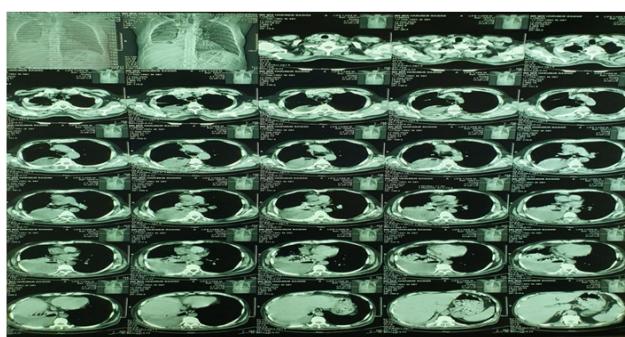
**Figure 1** Chest X-ray showing bilateral patchy opacities.



**Figure 2** Chest X-ray before tube thoracostomy showing right sided pneumothorax.



**Figure 3** Chest X ray after tube thoracostomy showing right sided hydropneumothorax.



**Figure 4** CT scan chest shows right sided encysted Hydropneumothorax.

**Table 1** Laboratory parameters of the patient

Parameters	Normal value	Patients value
Total WBC count	4,000-11,000/cumm	14400/cumm
Haemoglobin	13-17g/dl	11.2g/dl
Neutrophil	40-75%	91%
Lymphocyte	20-35%	5%
Eosinophil	1-6%	1%
Basophil	0-2%	0%
Monocyte	2-10%	3%
Platelet count	1,50,000-4,00,000/cumm	3,64,000/cumm
CRP	Upto 6U/L	24U/L
D dimer	Less than 0.5	0.38mcg/ml
Creatinine	0.7-1.2mg/dl	1.1mg/dl
RBS		7.8mmol/L
SGPT	40U/L	42U/L
Pleural fluid ADA	Less than 30U/L	64.87 U/L
Pleural fluid total count		3,00,00/cumm
Pleural fluid differential count		Neutrophil-85% Lymphocyte 10% Histiocyte 5% No malignant cell.

## Discussion

COVID-19 is a highly contagious viral pneumonia caused by SARS-CoV-2. Since its recognition in December 2019, COVID-19 till date has infected more than 230 million people worldwide and approx. 4.7 million people had expired and the count is increasing.<sup>2</sup> The most typical symptoms encountered in COVID-19 are fever, cough and dyspnoea. Radiological imaging plays vital role in diagnosing and following up the COVID-19 patients as standard rRT-PCR has a variable sensitivity and is influenced by many factors. Classical CT scan findings are patchy ground-glass opacities in bilateral lower lobar distribution. Pleural effusion, pericardial effusion, lymphadenopathy, cavitation, pneumothorax, hydropneumothorax, pneumomediastinum, giant bullae are some of the possible but least reported findings in COVID-19 pneumonia.<sup>3,4</sup> Secondary spontaneous pneumothorax and hydropneumothorax has been reported to complicate COVID-19 pneumonia like its ancestors SARS and MERS.<sup>5</sup> It has been assumed that about 1% of hospitalized patients with COVID-19 may develop pneumothorax even in the absence of previous lung disease and mechanical ventilation.<sup>1</sup> Multiple mechanisms have been postulated such as parenchymal injury, Ischaemia, intractable cough, infarction, pneumatocele rupture, mechanical or excessive noninvasive ventilation etc.<sup>1,6,7</sup> In patients with COVID-19, pneumothorax should be considered as a possible aetiology of acute decompensation. On the other hand, TB is the leading cause of death from a single infectious agent.<sup>8</sup> Like its previous ancestors SARS-CoV-1 and MERS related Coronavirus, TB-COVID-19 coinfection have been reported though data are limited.<sup>9</sup> As both diseases have overlapping clinical features and the same transmission mode, such co-infections are not uncommon.<sup>10</sup>

Tuberculosis is quite an established cause of pneumothorax, though now very rare in active TB infection, with an incidence ranging from 0.6 to 1.4%.<sup>11</sup> Possible mechanisms are caseous necrosis with bronchopleural fistulization or opening of a cavity in a pleural space and extensive involvement in case of military TB.<sup>10,11</sup> In our particular case, the diagnosis was challenging as patients persisting symptoms were initially overlooked as post-acute COVID-19 and was treated symptomatically. Pneumothorax, attributable to these dual pathologies in these particular patients was even more challenging to manage as the patient had an accompanying respiratory failure. Tube thoracostomy at the earliest possible time had saved the patient this time. But, subsequently the patient had developed hydropneumothorax, a harsh continuation of his agonizing sufferings. Hydropneumothorax has been reported in TB, but this complication is a rare occurrence in COVID-19 pneumonia and presentation was bilateral. Unilateral hydropneumothorax with pulmonary tuberculosis and COVID-19 is possibly the first ever reported case. Similar mechanisms have been postulated though.<sup>8,12</sup> This case report emphasizes the importance of suspecting pneumothorax both in COVID-19 and TB with acute decompensation. Chest Radiograph is of paramount importance in limited- resource settings for a possible early diagnosis. These patients also have a poorer prognosis if accompanied by respiratory failure. Excessive non invasive & mechanical ventilation may further aggravate ventilator-associated pneumothorax and extracorporeal membrane oxygenation may be an appropriate mode of correcting hypoxia.

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## Conflicts of interest

The authors declare that they have no conflicts of interest.

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