

Case Report

Atypical presentation of COVID-19 in a patient with spontaneous pneumothorax and pleural effusion: a case report

Tharun Venkatesan^{1*}, Meltem Bulut², Milenko Lazarevic³

¹Thoothukudi Medical College and Hospital, Thoothukudi, India

²Ankara Yildirim Beyazit University Faculty of Medicine, Ankara, Turkey

³Department of Internal Medicine, Swedish Covenant Hospital, Chicago, USA

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*Correspondence:

Dr. Tharun Venkatesan,

E-mail: jabarali2009@gmail.com

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ABSTRACT

Common COVID-19 symptoms include fever, cough, myalgia, and fatigue, with various complications possible. Pleural effusion and pneumothorax are rare and infrequently co-occur. These complications usually appear in hospitalized patients and often signal a poor prognosis. This report examines an 82-year-old male with severe abdominal pain, mild cough, and runny nose. Abdominal CT showed a small to intermediate right pleural effusion and a small left pneumothorax. Chest CT confirmed these findings and interstitial infiltrates. He tested positive for COVID-19. Treatment involved ceftriaxone (2 g), dexamethasone (6 mg), and remdesivir (100 mg); no chest tube or thoracentesis was required. By the 4th day, chest CT showed resolved pneumothorax and pneumonia, with the pleural effusion unchanged. On the 7th day, after completing a five-day remdesivir course, he was stable and discharged. This case suggests pleural effusion and spontaneous pneumothorax can co-occur in early COVID-19 without severe respiratory symptoms and are not always indicative of a poor prognosis.

Keywords: COVID-19, Pneumothorax, SARS- COV-2, Pleural effusion

INTRODUCTION

While COVID-19 presents with various symptoms and complications, pleural diseases, such as spontaneous pneumothorax and pleural effusion, are uncommon. The incidence of pleural effusion in patients with COVID-19 ranges from 2% to 11%.¹ The incidence increases with disease severity and patient age. It typically develops later in the disease and is generally small to intermediate.² The presence of pleural effusion generally indicates severe inflammation of the lung parenchyma.³

The incidence rate of pneumothorax is approximately 1%. It may be associated with mechanical ventilation, although in some cases it is observed in patients with spontaneous breathing. While its clinical significance remains unknown, it is thought to be associated with worsened prognosis.⁴ When the incidence of these complications is uncommon, it is very rare for spontaneous pneumothorax

and pleural effusion to occur simultaneously, as the pressure from the pneumothorax will prevent fluid from leaking out into the pleural space.² In this report, we present a case with both pneumothorax and pleural effusion in a patient who tested positive for COVID-19.

CASE REPORT

An 82-year-old male with a history of hypertension and diabetes mellitus presented to the outpatient clinic with epigastric pain, dry cough, and runny nose. On physical examination, the patient was hemodynamically stable, with a saturation of 94%. Auscultation revealed decreased air entry in the left and right basal lung fields. He was advised to undergo a CT scan of the abdomen and was prescribed pain relief medications. Four days later, the patient returned for follow-up of the CT results, which showed a small left pneumothorax and right pleural effusion. He was immediately sent to the emergency

department of Swedish Covenant Hospital, where he tested positive for COVID-19.



Figure 1: Diffuse coarse irregular interstitial markings.



Figure 2: Small right pleural effusion and associated right basal opacities.

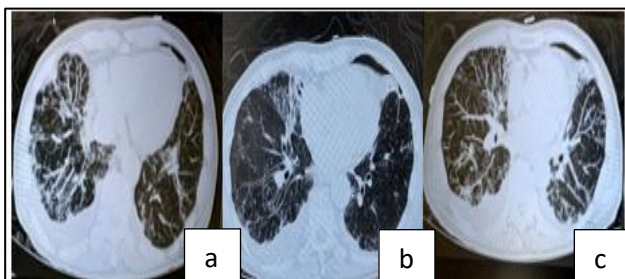


Figure 3 (a-c): Small right pleural effusion and small left pneumothorax, ground glass patterns seen bilaterally.

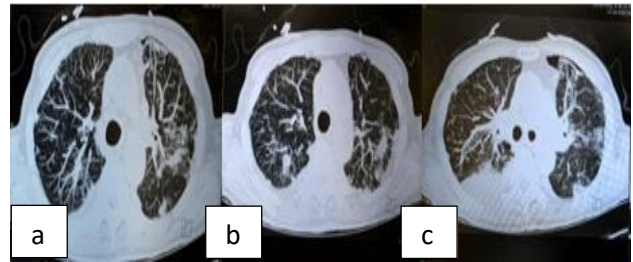


Figure 4 (a-c): Bronchiectasis seen bilaterally in peripheral pattern.

A CT scan of the chest without contrast showed a small left anterior pneumothorax, chronic bronchiectasis, and fibrotic changes in the pericardial areas of the lung, predominantly scarring in the pericardial pattern with underlying mild bronchiectasis and centrilobular nodularity. Contrast-enhanced CT tomography of the abdomen and pelvis revealed left anterior pneumothorax, scarring, and fibrosis in the lung bases, most prominently in the right middle lobe and lingula, with additional nodular ground-glass opacities throughout the lung bases and small bilateral pleural effusions.

After 4 days in the hospital, his chest radiograph showed resolution of the left pneumothorax. Pleural effusion remained unchanged, and thoracentesis was not performed. Community-acquired pneumonia resolved, while bronchiectasis remained unchanged. On the 6th day, his pneumothorax had resolved, bilateral pleural effusion remained unchanged, and there were no indications for a chest tube at this time. Bronchiectasis had resolved, community-acquired pneumonia was resolved and COVID-19 was resolving. He was cleared for discharge as his vitals were stable, his saturation was 99%, and it remained stable.

Table 1: Blood test results.

Test	Result	Normal range
White blood cell count	6990/dl	4000-9000/dl
	Neutrophils: 60.6%	
	Lymphocytes: 16.4%	
	Monocytes: 7.1%	
	Eosinophils: 14.4%	
	Basophils: 0.6%	
Haemoglobin	11.6 g/dl	12-17 g/dl
Platelet count	340000/dl	150,000-450,000/dl
Urinalysis		
	Protein: 1+	Negative
	Glucose: 2+	Negative
	Blood: 2+	Negative
	WBC: 6-10	0-2
	RBC: 20-40	0-2
Other tests		
QuantiFERON TB gold plus	Negative	
Influenza A and B	Negative	

Table 2: Medication and treatment administration of the case.

Medication/Treatment	Dosage/Form	Administration /Notes
Acetaminophen	650 mg	Oral
Amlodipine	5 mg	Oral
Apple juice		Oral
Ceftriaxone	2 gm IVPB daily	Intravenous
Dexamethasone	6 mg tablet	Oral
Enoxaparin sodium	40 mg	Subcutaneous injection
Glucagon	Recon solution 1mg	Subcutaneous injection
Glucose chewable tablet		Oral
Hydralazine	45 mg	Oral
Insulin (Lispro)	Correction table solution	Subcutaneous injection
Lidocaine	5% patch	Topical
Losartan	50 mg tablet	Oral
Metformin	500 mg	Oral
NaCl 0.9%+KCl solution	60 ml/hr	Intravenous infusion
Remdesivir	100 mg IVPB	Intravenous infusion
IP nasal cannula oxygen	5 l/min	Inhalation
Continuous pulse oximetry monitoring		Continuous monitoring

DISCUSSION

Although pneumothorax and pleural effusion are rarely seen in COVID-19, they usually manifest in the late stages in critically ill hospitalized patients with or without ventilatory support and are associated with a worse prognosis.^{2,4} However, in our case, the patient presented with both pneumothorax and pleural effusion in the outpatient clinic without respiratory distress, and the only presenting symptoms were epigastric pain, runny nose, and occasional dry cough. During his hospital course, he was comfortable with a saturation of 94% without oxygen support and did not undergo any interventions. Therefore, although this may not be the case for every patient, pleural complications and pneumothorax are not necessarily associated with worse prognosis.

Pneumothorax may be due to various pathophysiologies like: The development of cystic changes within the lung parenchyma, possibly due to substantial parenchymal injury caused by COVID-19, which may contribute to the risk of pneumothorax.⁴ But most of the time the reason for pneumothorax is unclear.⁵ It has been hypothesized that it is a defense mechanism against the infection.³ While sometimes it is due to severe inflammation of the lung parenchyma. It has also been said to be due to ischemic parenchymal changes, activation of fibroblast and inflammation resulting in exudate inside the alveolar airway, obstructing it and causing cystic formation.^{2,6}

Pleural effusion is hypothesized to be due to direct invasion of the virus into the visceral pleura, causing inflammation and resulting in the release of inflammatory cytokines that enhance the permeability of the visceral pleura. Pulmonary embolism, one of the important complications of COVID-19 also causes pleural effusion.⁷ Sometimes invasion of the lung parenchyma also causes inflammatory damage to the vascular endothelium and leakage of interstitial fluids from the microvasculature.¹ In patients with COVID-19, pleural effusion is mostly manifested 5 to 7 days after the hospital admission.⁸ In a case series investigating pneumothorax and pneumomediastinum in COVID-19 patients, various clinical scenarios were observed.⁹

Some patients presented acutely, arriving at the emergency department with symptoms of pneumothorax and evident respiratory distress. Others experienced pneumothorax during their hospital stays, with diagnoses often made incidentally.⁸ Moreover, pneumothorax can manifest early in the disease course, even before typical respiratory symptoms emerge. For instance, patients may present with atypical symptoms, such as abdominal pain, as observed in our patient. Therefore, the early detection of pneumothorax is crucial for optimal disease management and improved patient outcomes.

CONCLUSION

This case report highlights that although pleural effusion and pneumothorax are rare complications of COVID-19, they may occur together. They are present not only in critically ill patients but also in those who are asymptomatic or in those with atypical symptoms without respiratory distress. However, these do not necessarily represent a worse prognosis.

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