Symptoms of Pleurisy as the Initial Presentation of COVID-19

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Conflict of interest: None declared

Patient: Male, 48-year-old
Final Diagnosis: Viral pleurisy
Symptoms: Pleuritic chest pain
Medication: —
Clinical Procedure: —
Specialty: General and Internal Medicine

Background: Severe acute respiratory syndrome coronavirus 2, the virus responsible for Coronavirus Disease 2019 (COVID-19), has infected more than 8 million people worldwide and placed massive strains on healthcare systems around the world. Although classically causing cough, fever, and shortness of breath, increasing evidence suggests that manifestations of COVID-19 can be more subtle or masquerade as other clinical entities.

Case Report: A 48-year-old man with hypertension and type 2 diabetes mellitus presented to the Emergency Department with acute-onset pleuritic chest pain that had developed 1 day earlier and was found to be hypoxemic, requiring supplemental oxygen. He was admitted under the internal medicine service and underwent an extensive workup for his chest pain and hypoxemia, including a negative computed tomography scan with pulmonary embolism protocol, negative nuclear medicine ventilation/perfusion scan, normal electrocardiogram, and normal echocardiography. In the end, he was diagnosed with viral pleuritis as the diagnosis of exclusion. Our patient subsequently developed a fever and shortness of breath and his nasopharyngeal swab performed on admission to hospital returned positive for COVID-19. The patient’s pleuritic pain and oxygen requirements improved with supportive management over the next several days.

Conclusions: I report a patient who experienced pleuritic chest pain from viral pleurisy that was the initial manifestation of COVID-19 which, to the best of my knowledge, has not yet been reported in the literature. This case report further emphasizes that COVID-19 may present with atypical symptoms. It is crucial to be aware of these atypical presentations of COVID-19 so that patients are appropriately identified, isolated, and treated, while protecting health care workers from exposure.

MeSH Keywords: Chest Pain • Coronavirus • COVID-19 • Pleural Diseases • Pleurisy

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/925775
Background

The world is currently in the midst of the Coronavirus Disease 2019 (COVID-19) pandemic. Severe acute respiratory syndrome coronavirus 2, the virus responsible for COVID-19, has infected more than 8 million people worldwide and placed massive strains on healthcare systems around the world. This disease is still in its early stages internationally and there is much we still do not know about the virus. Although classically causing fever, cough, and shortness of breath, more and more evidence suggests that the manifestations of COVID-19 can be much more subtle or masquerade as other clinical entities. In addition to the classic respiratory symptoms, it is now becoming clear that gastrointestinal symptoms such as nausea and diarrhea, the loss of smell and taste, and thromboembolic events, among others, can be the main presentation of COVID-19 [1–3]. It is crucial for clinicians to be aware of these atypical presentations so that these patients are appropriately identified, isolated, and treated, while properly protecting health care workers from exposure. This article adds to this developing literature by reporting the first case of viral pleurisy associated with COVID-19.

Case Report

A 48-year-old white male presented to the Emergency Department with acute-onset pleuritic chest pain. He had a medical profile notable for hypertension and type 2 diabetes mellitus, with a recent hemoglobin A1c of 7.8%. His home medications included perindopril 8 mg daily, metformin 500 mg twice daily, and empagliflozin 25 mg daily, and there had been no changes to his regimen in recent months. He was an accountant and his only sick contact was a colleague who had returned from international travel with mild upper respiratory tract symptoms, whom the patient was exposed to several days earlier.

The patient appeared uncomfortable but in no distress. Vital signs demonstrated a temperature of 37.3°C, a heart rate of 110 beats per minute, a blood pressure of 155/92 that was equal bilaterally, a respiratory rate of 24 breaths per minute, and an oxygen saturation of 85% on room air that improved to 95% with 2 L/min of supplemental oxygen. A physical examination revealed a normal cardiac examination with a normal first and second heart sound, no murmurs or rubs, and a jugular venous pressure of 2 cm above the sternal angle. A respiratory examination revealed fine crackles to both bases bilaterally with poor inspiratory effort secondary to pain, but no wheeze. There was no tenderness to palpation over his chest wall. An abdominal examination was normal, with a soft and non-tender abdomen to all quadrants, with no organomegaly or costovertebral angle tenderness. He had no asymmetry or tenderness to his legs or calves and no peripheral edema.

Blood tests were notable for a mildly elevated white blood cell count of 12.9 × 10^9/L and an arterial blood gas revealing a partial pressure of oxygen of 56 mmHg, a pH of 7.35, a partial pressure of carbon dioxide of 41 mmHg, and a serum bicarbonate of 23 mmol/L. His coagulation studies, electrolytes, renal function, liver function, troponin, and creatinine kinase levels were within normal limits. His urinalysis did not show any abnormalities.

An electrocardiogram (ECG) demonstrated normal sinus rhythm with no atypical features. An initial 2-view chest x-ray was normal. The patient was sent for a contrast-enhanced computed tomography (CT) scan with pulmonary embolism (PE) protocol, which was technically adequate and was negative for PE. The CT scan was unremarkable aside from some bibasilar atelectasis and subsegmental atelectasis involving the lower lobes and did not demonstrate any evidence of ground-glass opacities.

The patient’s tachycardia had dropped to the 90s with fluid resuscitation but he remained on 2 L/min of supplemental oxygen and was subsequently admitted under the internal medicine service for further workup of his pleuritic chest pain with hypoxemia without clear etiology. Echocardiography demonstrated normal biventricular size and function, no significant valvular abnormalities, and no pericardial effusion. A D-dimer returned elevated at 1.65 mg/L and, due to a high suspicion of possible PE, the patient underwent a nuclear medicine ventilation/perfusion (V/Q) scan, which was also negative. He was ultimately diagnosed with viral pleuritis as the diagnosis of exclusion.

The patient’s pain was managed with acetaminophen and ibuprofen, which successfully reduced his pain. The following day, he developed a fever of 38.6°C and tachycardia of 120 beats per minute, at which point he had blood cultures drawn and was started on a loading dose of 500 mg of azithromycin intravenously (IV) followed by 250 mg IV q24h and ceftriaxone.
1000 mg IV q24h for a presumed early community-acquired pneumonia. His COVID-19 nasopharyngeal swab ultimately returned positive and Covid-19 was then thought to be responsible for his viral pleuritis. The diagnosis was made using the Cobas® SARS-CoV-2 test on the Cobas® 8800 system. Over the following 3 days, his shortness of breath and work of breathing worsened and his oxygen requirements increased from 2 L/min to a peak of 4 L/min. A repeat chest x-ray demonstrated mild bilateral lower-lobe opacities. A repeat ECG was unchanged and lab tests did not reveal any noteworthy abnormalities. Over the next 3 days, his chest pain completely resolved, oxygen requirements were weaned back to room air, antibiotics were discontinued after 5 days of therapy, and finalized blood cultures returned negative. The patient never received any COVID-19-specific treatment. After admission for 7 days, he was discharged home in stable condition and has since recovered after following up with his family physician.

### Table 1. Common causes of pleuritic chest pain.

| Infectious | • Pulmonary abscess  
|            | • Liver/splenic abscess  
| Cardiac    | • Empyema  
| Respiratory| • Viral pleuritis  
| Inflammatory| • Pulmonary embolism  
|            | • Pleural effusion  
|            | • Pneumothorax  
|            | • Hemorrhax  
| Hematologic/Oncologic| • Lupus pleuritis  
|            | • Rheumatoid pleuritis  
|            | • Malignancy  
|            | • Sickle cell crisis  

### Discussion

I report a patient who experienced pleuritic chest pain as the initial manifestation of infection with COVID-19, who subsequently developed more typical features, including cough, fever, shortness of breath, and hypoxia. After extensive workup for common causes of his pleuritic chest pain (Table 1), I believe the most likely cause for this patient’s presentation was viral pleuritis caused by COVID-19.

Although myopericarditis has been associated with COVID-19, this patient did not have pericardial features such as the typical positional changes in relation to his pain, a friction rub, or a pericardial effusion, and never developed any suggestive ECG features throughout his admission [4, 5]. He also did not develop a rise in his troponin or creatinine kinase to suggest myocardial involvement. Pulmonary embolism was extensively ruled out with a negative CT scan with PE protocol and a V/Q scan. His normal ECG and lack of elevated cardiac biomarkers ruled out an acute coronary syndrome. Imaging modalities did not support the diagnosis of any pleural effusion, hemothorax, pneumothorax, empyema, pulmonary abscess, malignancy, or liver/splenic abscess that were partially imaged with the patient’s CT scan, which may have explained his pain. The patient was white, effectively ruling out sickle cell disease. Although it is possible that this patient had a rheumatologic cause for pleurisy, he had no personal or family history of any rheumatologic symptoms, and this was thought to be exceptionally unlikely considering a positive COVID-19 swab, and further investigations were not pursued.

While in the Emergency Department, he was very worried about possibly having COVID-19 given the exposure to his colleague who had recently travelled, but was reassured by the medical team that this was exceptionally unlikely given his largely normal CT scan. Although most patients with COVID-19 have findings of ground-glass opacities on CT scan, which can be helpful to aid in diagnosis, is important to realize that this may not be a highly sensitive finding, especially early in the disease course [6]. A recent study of 1099 patients with COVID-19 by Guan et al. demonstrates that no radiographic or CT abnormality was identified in 17.9% of those who had non-severe disease at the time of admission to hospital and in 2.9% of those with severe disease [7]. If a patient is presenting with features concerning for COVID-19, clinicians should still exercise a high degree of suspicion even if the patient has normal imaging studies. Luckily, this patient had developed a dry cough by the time he presented to the Emergency Department, otherwise he may not have been isolated as quickly and may possibly have exposed health care workers to the virus.

### Conclusions

To the best of my knowledge, this is the first reported case of COVID-19-associated viral pleurisy in the literature. Additionally, this patient’s pleurisy was his initial presenting symptom, which developed prior to the onset of his cough, fever, and shortness of breath. Although cough, fever, and shortness of breath appear to be the most common manifestations of COVID-19, this disease is demonstrating that it has atypical presentations such as the pleurisy described here. Given that COVID-19 can masquerade as other clinical entities, clinicians must continue to exercise a high degree of suspicion when assessing undifferentiated patients.

### Conflicts of interest

None.
References: