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Case Report

Acute Pericarditis as the First Manifestation of COVID-19: A Case Report

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Received Date: 25 January 2025 **Accepted Date**: 10 February 2025 **Published Date**: 18 February 2025.

Citation: Lak Mehran, Vosough Farnoosh, Sharifi Shahnaz, Saberi Kianoush, (2025), Acute Pericarditis as the First Manifestation of COVID-19: A Case Report, Clinical research and Clinical reports 7(2): DOI: 10.31579/2835-8325/147

Abstract

This case report discusses pericarditis as a rare and primary manifestation of COVID-19, requiring a multi-faceted treatment approach. Although COVID-19 is primarily known for causing respiratory symptoms, growing evidence shows that it can also affect other organ systems, including the cardiovascular system. In this case, a patient with a history of ischemic heart disease and atrial fibrillation presented with pericarditis as the only symptom of COVID-19. Due to the rarity of this presentation, healthcare providers should remain alert to atypical signs of COVID-19 and maintain a broad differential diagnosis. The patient's treatment involved a combination of anti-inflammatory and antiviral medications, underscoring the need for a personalized, multidisciplinary strategy in managing such cases. This report highlights the importance of recognizing cardiovascular complications linked to COVID-19 and the potential need for additional treatments to manage these patients effectively.

Key words: COVID-19; cardiovascular complications

Introduction

COVID-19, caused by the SARS-CoV-2 virus, began spreading globally in late 2019, quickly evolving into a pandemic(1). As of June 2024, COVID-19 has affected more than 775 million people worldwide (2). While the most common clinical manifestations are fever, cough, and shortness of breath, COVID-19 has been shown to present with a wide range of symptoms, from mild illness to severe respiratory failure (3). Although COVID-19 is primarily known for its respiratory involvement, emerging evidence indicates that the virus can initially present with cardiovascular symptoms such as chest pain, palpitations, and arrhythmias, particularly in individuals with underlying heart conditions (4).Pericarditis, an inflammation of the heart's outer lining, has been reported as a rare but significant early manifestation in COVID-19 patients(5). This case underscores the importance of considering COVID-19 in patients presenting with unexplained cardiovascular symptoms, even in the absence of respiratory complaints.

Case presentation

A 67-year-old female presented to the emergency department with retrosternal chest pain radiating to her back. The pain was persistent, aggravated by lying flat, and had progressively worsened since its onset that morning. She also reported that the pain was exacerbated with respiration.

The patient's medical history was significant for ischemic heart disease, diagnosed via angiography one year earlier, atrial fibrillation, type 2 diabetes mellitus, and dyslipidemia. Her current medications included Apixaban, Losartan, Bisoprolol, Atorvastatin, Pantoprazole, Novorapid, Lantus, and Chlordiazepoxide. Surgical history included cholecystectomy and hysterectomy.

Upon examination, the patient appeared acutely ill. Vital signs revealed a heart rate of 140 bpm, blood pressure of 130/80 mm Hg, respiratory rate of 18 breaths/min, temperature of 36.6°C, and oxygen saturation of 93% on room air. Cardiac auscultation identified irregular S1 and S2 heart

sounds, along with decreased heart sounds. Other aspects of the physical examination were unremarkable.

Initial electrocardiogram (ECG) showed rapid atrial fibrillation, poor R-wave progression, and pulsus alternans (Figure 1). Laboratory results demonstrated a white blood cell count of 7.2 × 10^3/µl, platelet count of 151 × 10^3/µl, erythrocyte sedimentation rate (ESR) of 55 mm/hr, C-reactive protein (CRP) of 147 mg/l, blood glucose level of 530 mg/dL, creatine phosphokinase (CPK) of 42 IU/L, CK-MB of 10 IU/L (normal <24 IU/L), troponin <0.2 ng/L (normal <14 ng/L), aspartate aminotransferase (AST) 14 U/L, and alanine aminotransferase (ALT) 14 U/L.

Transthoracic echocardiography revealed severe pericardial effusion (ranging from 15 to 22 mm), with early right ventricular collapse and significant respiratory variation (Figure 3). Notably, an echocardiogram performed two weeks prior showed no signs of pericardial effusion. Serological tests for QuantiFERON, ANA, anti-dsDNA, HIV, complement profile, and hepatitis were all negative.

A pericardiocentesis was performed, yielding 600 cc of brownish, turbid fluid. Histological analysis demonstrated a predominance of lymphocytes, and cultures were negative. Pathological examination of the biopsy revealed fibrinous pericarditis.

Follow-up echocardiograms showed stable left ventricular systolic function and no increase in pericardial effusion. The patient was discharged in stable condition, with modifications to her medication regimen, including colchicine (1 g daily), Lantus, prednisolone, and an increased dosage of Apixaban (5 mg BD).

The patient was initially treated with colchicine (0.5 mg twice daily), ibuprofen (400 mg TDS), and underwent a pericardial window procedure. Despite these interventions, chest pain persisted. Given the ongoing clinical concern, PCR testing for COVID-19 was conducted, which returned positive with a CT value of 31. Subsequently, intravenous Remdesivir (200 mg on day one, followed by 100 mg for the next four days) and IV dexamethasone (8 mg daily) were initiated. Following the COVID-19 diagnosis, an interleukin-6 (IL-6) test was ordered, which returned a value of 22 pg/ml (normal range).

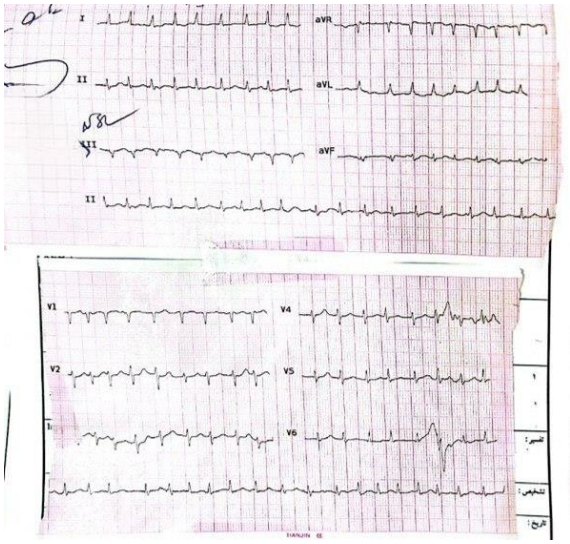

Figure 1: EKG exhibits atrial fibrillation.

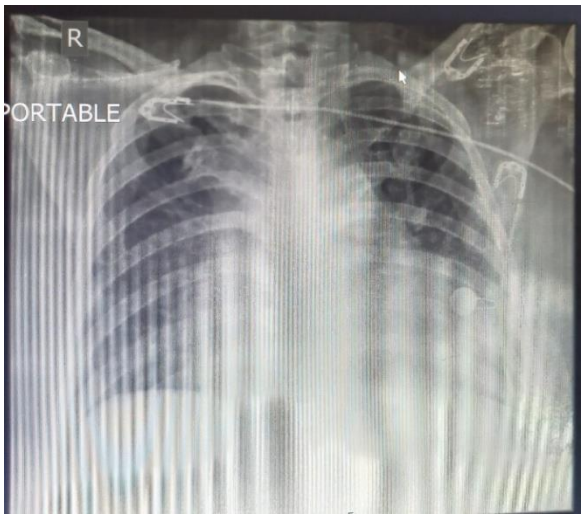

Figure 2: Initial chest X-ray demonstrated an enlarged cardiac index of 0.6, with clear lung fields

Pericarditis as an early manifestation of COVID-19 has been documented in other cases, particularly in patients with pre-existing cardiovascular conditions. [6,7,8,9] However, their treatment courses differed from our patient's. Sauer, F. reported an 84-year-old patient with a history of hypertension whose initial symptoms included dyspnea, fever, and severe asthenia. The patient was treated with colchicine (0.5 mg once daily) starting on Day 1 and was discharged on Day 8 (6). Kumar et al. reported a patient with hypertension who presented to the emergency department with pleuritic chest pain and was treated with

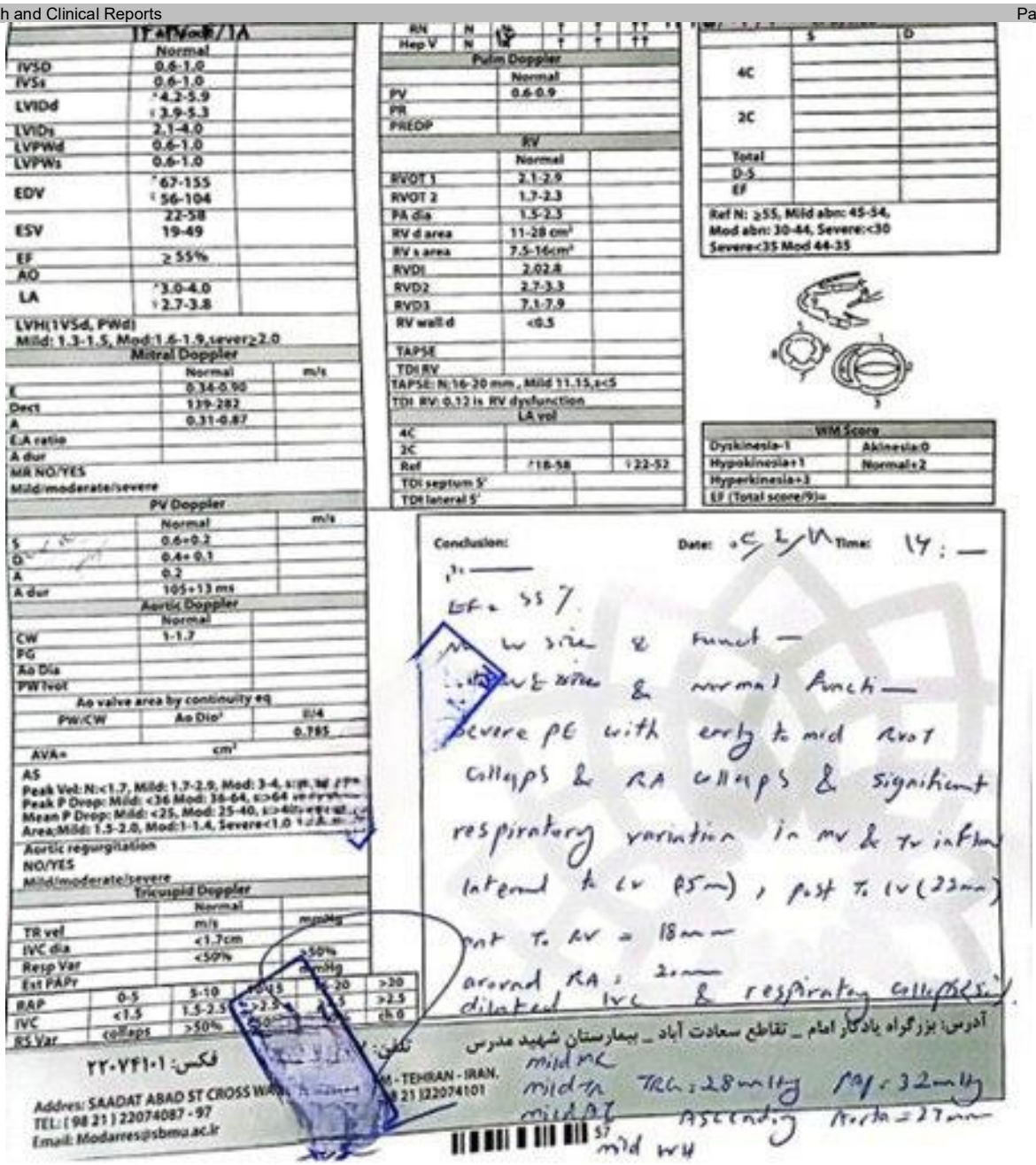

Figure 3: echocardiography report, it revealed severe pericardial effusion (ranging from 15 to 22 mm), with early right ventricular collapse and significant respiratory variation.

Discussion

Pericarditis as an early manifestation of COVID-19 has been documented in other cases, particularly in patients with pre-existing cardiovascular conditions. [6,7,8,9] However, their treatment courses differed from our patient's. Sauer, F. reported an 84-year-old patient with a history of hypertension whose initial symptoms included dyspnea, fever, and severe asthenia. The patient was treated with colchicine (0.5 mg once daily) starting on Day 1 and was discharged on Day 8 (6). Kumar et al. reported a patient with hypertension who presented to the emergency department with pleuritic chest pain and was treated with oral colchicine, being discharged on Day 4. Interestingly, their patient was readmitted on Day 6 due to recurrent intermittent pleuritic chest pain and a dry cough, for which only symptomatic treatment was administered(7). Naqvi, S.G.Z. described a 55-year-old male with hypertension who presented with chest pain but showed no respiratory symptoms throughout the clinical course. The patient was treated with indomethacin (25 mg three times daily) and aspirin (600 mg six times daily)(8). Ghosh, S. presented a 56-year-old male with a history of hypertension and diabetes who experienced acute chest pain for one day when visiting the emergency department. He had no respiratory symptoms. He was treated with high-dose aspirin (650 mg three times daily) and colchicine (0.5 mg twice daily) and was discharged in good condition on Day 5(9).

Acute pericarditis, an inflammation of the pericardium, can result from viral infections, autoimmune disorders, or post-cardiac injury(10). When caused by COVID-19, the virus may directly infect heart tissue or trigger an immune response(11). Pericarditis typically presents with sharp, stabbing chest pain, often worsening with deep breathing or coughing. Additional symptoms include fever, fatigue, dyspnea, tachycardia, and pericardial friction rub. Patients may also experience light-headedness or fainting, particularly if there is significant pericardial effusion or tamponade(12).The primary anti-inflammatory treatment for acute pericarditis involves the use of NSAIDs and colchicine(10). In severe cases or those refractory to anti-inflammatory drugs, corticosteroids may be considered(11).Our patient was initially treated with colchicine, ibuprofen and dexamethasone at the first step.

Conclusion

In conclusion, this case underscores the importance of considering COVID-19 in patients who present with unexplained chest pain or other cardiovascular symptoms, even in the absence of typical respiratory signs. This case serves as a reminder that COVID-19 can present in many different ways, and healthcare providers should remain vigilant, particularly with high-risk individuals.

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