

## CASE REPORT

## A rare presentation of a patient with COVID-19: Cardiac tamponade

## COVID-19 hastasının nadir bir prezentasyonu: Kardiyak tamponat

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**Summary**– The clinical presentation of coronavirus disease 2019 (COVID-19), which is caused by severe acute respiratory syndrome coronavirus 2, can range from only mild, flu-like symptoms to severe progressive pneumonia. Cardiac involvement may be observed during the course of the infection and may include myocarditis, acute myocardial infarction, heart failure, and cardiac rhythm disturbances, but cases describing cardiac tamponade in patients previously diagnosed with COVID-19 are very rare. A 58-year-old female had been hospitalized in another hospital 2 weeks prior to the currently described presentation due to atypical pneumonia. A nasopharyngeal swab specimen was positive for COVID-19. The hospitalization was uncomplicated and she was discharged after a week. She presented at our emergency department with symptoms of shortness of breath and swelling in both legs. A bedside transthoracic echocardiography showed globally depressed left ventricular contraction with an ejection fraction of 30% and there was significant pericardial effusion, which surrounded the entire heart and restricted diastolic filling. The patient was admitted to the coronary intensive care unit with the diagnosis of pericardial tamponade. Bedside pericardiocentesis was performed and serohemorrhagic fluid was drained. Pericardial effusion and pericardial tamponade should be considered in the differential diagnosis of patients with COVID-19 exhibiting dyspnea or worsening of dyspnea.

**Özet**– SARS-CoV-2'nin neden olduğu Coronavirus hastalığı 2019 (COVID-19) sadece hafif grip benzeri semptomlardan ağır progresif pnömoniye kadar değişen geniş bir klinik prezentasyona sahiptir. Enfeksiyonun seyirinde miyokardit, akut miyokart enfarktüsü, kalp yetersizliği, kardiyak ritim bozukluklarını içeren kardiyak tutulum gözlenebilir; ama önceden COVID-19 tanısı almış çok nadir sayıda hastada kardiyak tamponat tanımlanmıştır. Elli sekiz yaşında kadın hasta iki hafta önce başka bir hastanede atipik pnömoni nedeniyle hastaneye yatırılmış. Nazofaringeal sürüntü incelemesinde COVID-19 pozitif saptanmış. Hasta komplikasyonsuz bir hospitalizasyon süreci geçirmiş ve bir hafta önce taburcu edilmiş. Hasta acil servisimize nefes darlığı ve bacaklarda şişme şikayeti ile geldi. Yatak başı yapılan transtorasik ekokardiyografide (TTE) global olarak azalmış sol ventrikül sistolik fonksiyonları ile birlikte ejeksiyon fraksiyonu (EF) %30 ve tüm kalbi çepeçevre saran ve diastolik doluşta restriksiyona yol açan ciddi perikardiyal effüzyon görüldü. Hasta perikardiyal tamponat tanısı ile koroner yoğun bakım ünitesine (KYBU) kabul edildi. Yatakbaşı perikardiyosentez yapıldı ve serohemorajik sıvı drene edildi. COVID-19 enfeksiyonu olan hastalarda dispne gelişmesi veya dispnenin kötüleşmesi durumunda perikardiyal effüzyon ve perikardiyal tamponat ayırıcı tanıda düşünülmelidir.

The novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was first reported in China in late December 2019 after the diagnosis of a cluster of patients with pneumonia of an unknown cause. The World Health Organization soon declared a global health emergency as the infection rapidly spread worldwide. Coronavirus disease 2019 (COVID-19), which is caused by SARS-CoV-2, has a wide spec-

trum of clinical presentations, ranging from only mild, flu-like symptoms to severe progressive pneumonia. Cardiac involvement

**Abbreviations:**

AF	Atrial fibrillation
COVID-19	Coronavirus disease 2019
ECG	Electrocardiogram
EF	Ejection fraction
LDH	Lactate dehydrogenase
SARS-CoV-2	Severe acute respiratory syndrome coronavirus 2
TTE	Transthoracic echocardiography

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may be observed during the course of the infection, and can include myocarditis, acute myocardial infarction, heart failure, and cardiac rhythm disturbances. Recently, several cases of myocarditis in patients who were previously diagnosed with COVID-19 have been described.<sup>[1-3]</sup>

This is a case report of a patient with cardiac tamponade who had been recently diagnosed with COVID-19.

### CASE REPORT

A 58-year-old female presented at the emergency department with symptoms of shortness of breath and swelling in both legs. Her general medical history was not significant, with the exceptions of smoking and arterial hypertension, which was under control. The medications she used were amlodipine and occasional ibuprofen. She had been hospitalized at another hospital 2 weeks earlier due to atypical pneumonia. A nasopharyngeal swab specimen was positive for COVID-19. A thorax computed tomography image showed viral pneumonic infiltration with no pericardial effusion (Fig. 1). She developed atrial fibrillation (AF), and apixaban 5 mg and metoprolol 50 mg twice a day were initiated. No complications were observed during the hospitalization and she was discharged a week prior to the current presentation.

In the emergency department, the patient was tachypneic, with a respiratory rate of 25 breaths per minute, an oxygen saturation rate of 90% with ambient air, a



**Figure 1.** Thorax computed tomography image with no pericardial effusion or viral pneumonic infiltration.



**Figure 2.** A 12-lead resting electrocardiogram recorded on admission demonstrating atrial fibrillation with rapid ventricle response and low R voltage in the precordial leads.



**Figure 3.** Chest X-ray recorded on admission with left pleural effusion and a high cardiothoracic ratio.

systolic and diastolic arterial blood pressure value of 125 mmHg and 75 mmHg, respectively, and an axillary body temperature of 36.7°C. A physical examination revealed crackles in the basal part of the left lung and positive pretibial pitting edema (+) in both legs. Her electrocardiogram (ECG) revealed AF with rapid ventricle response and low R voltage in the precordial leads. No ischemic changes were observed (Fig. 2). A chest X-ray showed left pleural effusion and a high cardiothoracic ratio (Fig. 3). Bedside transthoracic echocardiography (TTE) was performed and revealed globally depressed left ventricular contraction with an ejection fraction (EF) of 30%, rheumatic mitral valve disease, and mild mitral, aortic, and tricuspid valve insufficiencies. There was significant pericardial effusion, which surrounded the entire heart and restricted

diastolic filling. Respiratory variation in mitral and tricuspid valve blood flow velocity was recorded (Fig. 4a-c). Blood tests results revealed no abnormalities except a mildly elevated high-sensitivity cardiac troponin T level (0.07 pg/mL; normal range: <0.03 pg/mL). Her renal and liver function, white blood count, and C-reactive protein level were within the normal range. The patient was admitted to the coronary intensive care unit with the diagnosis of pericardial tamponade. Pulsus paradoxus was detected in arterial monitoring. Bedside pericardiocentesis was performed and 1500 mL of serohemorrhagic fluid was drained. The pericardial fluid biochemistry results displayed exudative characteristics (fluid lactate dehydrogenase [LDH]: 1818 IU/L, pericardial fluid LDH/serum LDH: >0.6). A repeat nasopharyngeal swab test for COVID-19 was negative, as was a COVID-19 polymerase chain reaction test of pericardial fluid. A serum autoimmune panel and a fluid acid-fast bacilli smear were also negative. In addition, there was no bacterial growth in the fluid, and cultures for tuberculosis and fungi were negative. A control TTE revealed no pericardial fluid (Fig. 4d).

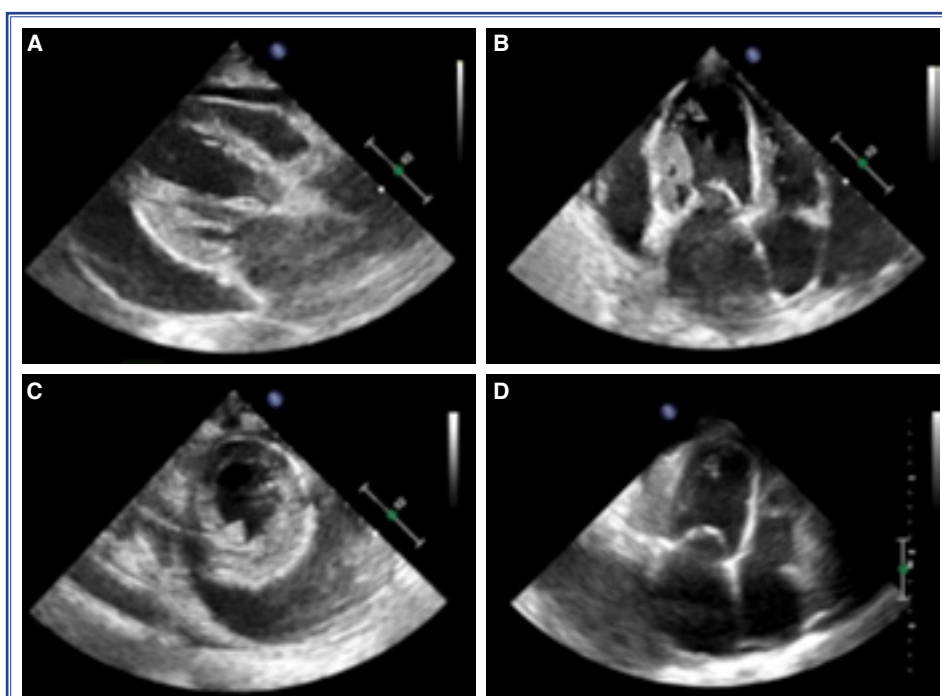
We contacted the patient 6 months later. Follow-up examinations had been performed at another hospital.

It was learned that normal coronary arteries were observed with coronary angiography and an EF of 50% was noted with transthoracic echocardiography. Since there was no critical stenosis in the coronary arteries and a normalized EF was observed in an echocardiographic examination, the most probable explanation was thought to be COVID-19-associated perimyocarditis, pericardial effusion, and cardiac tamponade.

## DISCUSSION

The primary clinical manifestation of COVID-19 is respiratory tract disease, but recent reports have suggested that 12% of patients had cardiac involvement. Importantly, cardiac injury has been associated with a greater risk of mortality.<sup>[4]</sup> Most of the cardiac involvement seen is myocardial injury in the form of myocarditis or acute myocardial infarction; presentation with pericardial involvement is rare.<sup>[5,6]</sup> In the present case, the patient developed cardiac tamponade during the course of COVID-19.

Pathologic inflammatory processes cause increased production of pericardial fluid, resulting in exudative pericardial effusion. The clinical symptoms vary according to several factors, including the onset



**Figure 4.** Two-dimensional transthoracic echocardiography images obtained on admission in (A) parasternal long-axis view, (B) apical 4-chamber view, (C) parasternal short-axis view, (D) and in apical 4-chamber view after pericardiocentesis. Figure 1A, B, and C show significant pericardial effusion surrounding the heart, and image D illustrates no pericardial effusion.

and quantity of accumulation, underlying disease, and comorbid conditions of the patient.<sup>[7]</sup> In developed countries, the majority of cases are idiopathic, and 15% to 30% are related to infectious diseases.<sup>[8]</sup> Viral pericarditis is usually benign and only mild symptoms develop during the course of the illness. In a study of 300 acute pericarditis patients, the frequency of pericardial effusion was 60% and the frequency of pericardial tamponade was 5%.<sup>[9]</sup> Notably, however, cases of hemorrhagic cardiac tamponade following viral pericarditis have been reported previously with Coxsackie viruses.<sup>[10]</sup>

In the present case, no pericardial fluid was reported based on the computed tomography examination performed during the prior hospitalization for COVID-19. The patient's symptoms started and progressed after her initial discharge upon completion of COVID-19 treatment. In a differential diagnosis for such a case, acute coronary syndrome, pulmonary embolism, and congestive heart failure should be considered. In our case, the patient had no segmental wall motion abnormality or angina pectoris. Serial ECG records revealed no ischemic changes. After pericardiocentesis and ensuring hemodynamic stability, coronary angiography was recommended to the patient, but she declined. Compared with pericarditis, the probability of developing pericardial tamponade in acute coronary syndrome is extremely low, unless there is a mechanical complication.

### Conclusion

COVID-19 infection has spread worldwide, and at present, the number of cases continues to increase. Our knowledge of COVID-19 cardiac involvement and course is still insufficient. Several cases of COVID-19-related myocarditis have been described, but pericardial tamponade is very rare. Nonetheless, in patients with the COVID-19 infection who develop or have worsening dyspnea, pericardial effusion or pericardial tamponade should be considered in the differential diagnosis and managed immediately.

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**Anahtar sözcükler:** Kardiyak tamponat; COVID-19; perikardiyal efüzyon.