Case Report

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Benign Outcomes in Two Heart Transplant Patients with COVID-19 Pneumonia

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Abstract

We report here two consecutive coronavirus disease-2019 (COVID-19) pneumonia in our post-heart transplant patients 13 years and 15 years after the transplantation during the pandemic. COVID-19 pneumonia were confirmed clinically and by thorax computed tomography in both of the cases. Due to severe symptoms and the high-risk condition of the patients, they were immediately admitted to the hospital and standard COVID-19 treatment protocol with oral favipravir and low molecular weight heparin were applied to both patients. None of them was needed to transfer to intensive care unit and responded immediately to medical treatment and observed in regular COVID-19 ward. No alterations in their immunosuppressive therapy was applied during their stay in the hospital and none of them had cytokine storm during their stay in the hospital. Echocardiography of both patients showed normal left and right ventricular functions with no myocardial depression or sign of pulmonary hypertension. Patients were discharged at fifth and tenth days of diagnosis, respectively, with COVID-19 negative polymerase chain reaction and asymptomatic status.

Keywords: Heart transplant, COVID-19 pneumonia, immunosuppression

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Introduction

We report here two consecutive coronavirus disease-2019 (COVID-19) pneumonia in our post-heart transplant patients 13 years and 15 years after the transplantation during the pandemic. COVID-19 pneumonia was confirmed clinically and by thorax computed tomography (CT) in both the cases. Because of severe symptoms and the high-risk condition of the patients, they were immediately admitted to the hospital and the standard COVID-19 treatment protocol with oral favipravir and low-molecular-weight heparin were applied to both patients. None of them needed to be transferred to an intensive care unit and all responded immediately to medical treatment and were observed in regular COVID-19 ward. No alterations in their immunosuppressive therapy were applied during their stay in the hospital and none of them had a cytokine storm during their stay in the hospital. Echocardiography (ECHO) of both patients showed normal left and right ventricular functions with no myocardial depression or sign of pulmonary hypertension. Patients were discharged in the fifth and tenth days of diagnosis, respectively, with COVID-19-negative polymerase chain reaction (PCR) and asymptomatic status.

Case Reports

Case 1

A 66-year-old female patient (L.G.) who had orthotopic heart transplantation due to ischemic heart failure in 2009 was admitted to the hospital with the complaints of sluggish feeling, nausea and tiredness on December 7, 2020, with the suspicion of rejection.

On physical examination, body surface temperature was 36.7 °C, peripheral oxygen saturation was 98%, and respiratory rate was 16 breaths per minute. Routine laboratory tests revealed no abnormality as well as no sign of chronic rejection with left ventricular ejection fraction (LVEF) of 60% in transthoracic ECHO that was performed to evaluate allograft functions.

Cardiac rejection, which could be associated with tiredness and sluggish feeling, was therefore excluded (Table 1).

Despite that, the reverse transcriptase-PCR (RT-PCR) test result of the nasopharyngeal swab sample taken on December 07 for 2019-nCoV was positive. Thorax CT showed subpleural reticular density increases in the middle lobe of the right lung and bilateral lung lower lobes and peripheral ground-glass opacities in the lower lobe of the left lung (Figure 1). The patient was diagnosed with

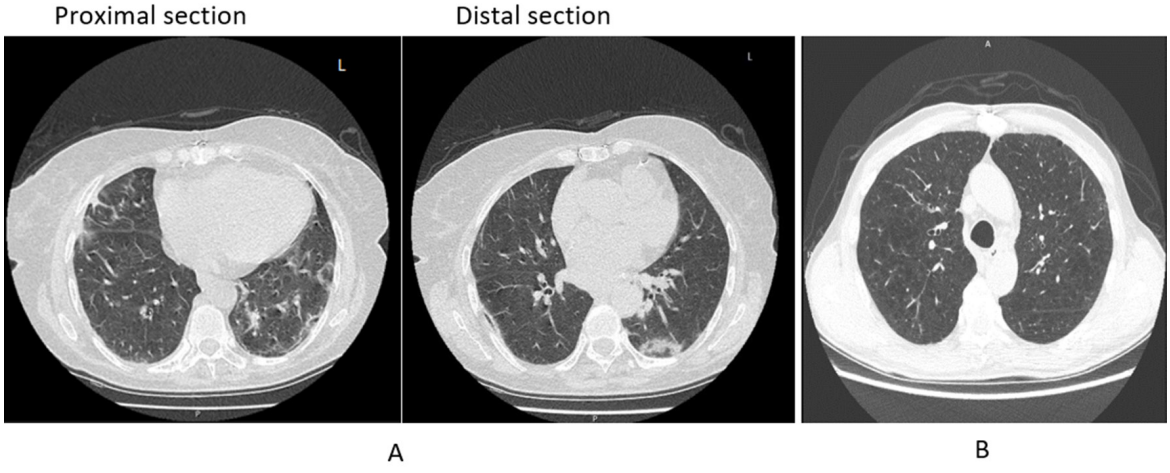

Figure 1. A: Case 1, Two different cross-sectional views of the ground glass areas, especially seen in the left lung, B: Case 2, Emphysema and bronchial enlargement was observed in thorax CT.

CT: Computed tomography

COVID-19 pneumonia by a pneumonologist on call and was immediately transferred to the COVID ward of the same hospital (Dokuz Eylül University Hospital/İzmir, Turkey).

She was already on Tacrolimus 2.5 mg once a day and mycophenolate mofetil 0.5 g twice a day with very strictly controlled Tacrolimus plasma level (12.3 ng/mL) with no additional risk factors like diabetes mellitus, pulmonary hypertension, or heart failure apart from being an New York Heart Association class-0, asymptomatic heart transplant case. Additionally, she was not vaccinated before hospitalization since the corona vaccination program has not started at that time in Turkey.

She was put on favipravir 1600 mg b.d. continued with 600 mg once a day and 4 mg of enoxaparin s.c. once a day for thrombosis prophylaxis as well as supportive vitamin treatment and diet. Since there was been no desaturation, tachypnea, fever, or any other sign of clinical deterioration for five days during her hospital stay, she was considered as convenient for "home follow-up" and was discharged. On the seventh day of her outpatient clinic examination, she has negative RT-PCR test with no complaints of tiredness or sluggish feeling.

Case 2

A 60-year-old male patient (A.S.) who received a heart transplant due to hypertrophic cardiomyopathy in 2009 was admitted to the hospital with complaints of cough, feeling cold and chills on September 28, 2021. On physical examination, body surface temperature was 37 °C, peripheral oxygen saturation was 96%, and respiratory rate was 18 breaths per minute. Routine laboratory tests revealed signs of acute infection with CRP 75.6 mg/L, ferritin 334 ng/mL, LDH 216 U/L, D-Dimer 332 Âµg / mL with no sign of rejection on ECHO with 60% LVEF.

The RT-PCR test result was positive on September 28, 2021, and no specific findings related to COVID-19 pneumonia but chronic emphysema and bronchial enlargement were observed in Thorax CT (Figure 1B).

The patient was already on Tacrolimus 2.5 mg once a day and mycophenolate mofetil 1 g twice a day. Before admission, the last tacrolimus plasma level was found to be 15.54 ng/mL. He had only controlled hypertension with carvedilol 12.5 mg once a day as a risk factor for COVID-19, besides immunosuppressive treatment for heart transplantation.

He had prior regular vaccination with 3 doses of CoronaVac (Sinovac) and the last dose was approximately 2 months before the onset of the symptoms.

The patient, who was considered to have mild pneumonia, was followed up in the Pandemic Service because he was using immunosuppressive therapy. 1600 mg twice daily on the first day and each day 600 mg twice daily for favipravir treatment was initiated. This treatment was applied for five days.

During this period, 60 mg enoxaparin was administered subcutaneously once a day for thrombosis prophylaxis. There was no desaturation, tachypnea, or fever during his hospital stay. The patient, who showed no clinical progression for nine days, was considered suitable for home follow-up and was discharged (Table 2).

Discussion

These cases showed us that heart transplant recipients may have similar clinical presentation and progression to non-transplant patients. Additionally, in these cases, the use of immunosuppression drugs is not an aggravating

Table 1. Laboratory blood test results

LAB	WBC	CPR	Ferritin	LDH	D-Dimer	EF	EKG
Case 1	5x1000/uL	1.1 mg/L	630.8 ng/mL	166 U/L	0.2 ug/mL	60%	Sinus
Case 2	5.29x10³/uL	334 ng/mL	1.1 mg/L	216 U/L	332 ug/mL	60%	Sinus

Leukocytes (WBC) (normal value 4-10.3 x 1000/µL), CRP: C-reactive protein (normal value 0.2-5 mg/L), ferritin 630.8 ng/mL (normal value 11-306.8 ng/mL), LDH: Lactate dehydrogenase 166 U/L (normal value 125-221 U/ L), D-Dimer 0.2 ug/mL (normal value 0-0.55 ug/mL), EF: Ejection fraction, EKG: Electrocardiography

Table 2. Clinical characteristics of heart transplant patients with COVID-19 pneumonia

Clinical information	Explanation	Explanation
Case 1		**Case 2**
Personal information	Female, 66 years old	Male, 60 years old
Complaint	Weakness nausea and fatigue	Cough and chill
Comorbidities	Hypertension	Hypertension
Medical history	MI in 2000 CABG in 2003, heart tx in 2009	HCM in 2006, heart tx in 2007
Immunosupression	Mycophenolate mofetil 2x500 mg, Tacrolimus 1x2.5 mg	Mycophenolate mofetil 2x1000 mg, Tacrolimus 1x5 mg
Physical examination	Fever: 36.7, SatO2: 98, RR: 16	Fever: 7, SatO2: 96, RR: 18
RT-PCR	Nasopharyngeal swab positive	Nasopharyngeal swab positive
Thorax CT	Ground-glass opacities in the lower lobe of the left lung	No specific findings
Treatment	Favirpravir 2x1600 mg first day, after each day 2x600 mg oral, Enoxaparin 1x40 mg for five days	Favirpravir 2x1600 mg first day, after each day 2x600 mg oral, Enoxaparin 1x60 mg for five days

Prognosis: Clinical well-being is expressed as no desaturation, no fever, and no respiratory[2]
COVID-19: Coronavirus disease-2019, RT-PCR: Reverse transcriptase-polymerase chain reaction, CT: Computed tomography

factor for the clinical course. In China, COVID-19 pneumonia was detected in two different heart transplant recipients. These cases may represent of COVID-19 in heart transplant recipients and suggest that presentations and prognosis appear to be similar to those observed in non-transplant patients. But they also associated radiological resolution with clinical well-being and the regression of radiological lesions in the lung was accepted as one of the healing criteria[2]. In this regard, further quantitative criteria are needed as indicators of positive response for the treatment of COVID-19 pneumonia and more epidemiological studies would be useful for associating COVID-19 with organ transplant patients.

The list of heart transplantation patients in Dokuz Eylül University (DEU) between the years of 1998- 2015 can be seen in Table 3.

Conclusion

The resulting studies show that the spectrum of the disease caused by the new type of coronavirus (2019-nCoV, SARS-CoV-2) is variable from the common cold to Severe Acute Respiratory Syndrome (SARS). Advanced age, immunosuppression (transplantation, immunosuppressive drug users), cardiovascular disease, hypertension is among the serious risk factors in COVID-19 pneumonia[3]. In this

Table 3. List of heart transplantation patients in the DEU

Name-surname with initials	Year of transplantation
F. S.	1998
R. T.	1999
C. S.	2000
E. S.	2002
S. D.	2003
O. Ü.	2004
A. Y.	2004
H. Y.	2005
S. G.	2006
H. S.	2006
A. S.	2007
E. G.	2007
H. A. A.	2007
M. A.	2007
N. Y.	2007
F. C.	2007
N. K.	2008
A. D.	2008
S. A.	2008
F. S.	2008
A. S.	2008
L. G.	2009
B. Y.	2009
I. A.	2009
A. G.	2010
S. K.	2010
M. İ.	2011

Table 3. Continued

Name-surname with initials	Year of transplantation
A. S.	2011
M. B.	2011
Z. S.	2012
R. B.	2012
M. Ö.	2013
Y. E.	2015

article, we report a heart transplant recipient we detected with COVID-19 pneumonia.

Immunosuppression in heart transplant patients may be a favorable factor during COVID pneumonia. The absence of potential risks of immunosuppression in our cases seems to be another positive predictive factor. Hypertension and immunosuppression were observed in both cases. However, in the second case, the German vaccine may be effective in a milder course of lung disease. In this article, we emphasized a relatively mild clinical course of COVID pneumonia in heart transplant patients under immunosuppression therapy.

Ethics

Informed Consent: The informed consent was obtained for the article.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Concept: O.B.D., O.K., Ö.O., Design: O.B.D., O.K., Ö.O., Data Collection and/or Processing: O.B.D., O.K., Ö.O., Analysis and/or Interpretation: O.B.D., O.K., Ö.O., Literature Search: O.B.D., O.K., Ö.O., Writing: O.B.D., O.K., Ö.O.

Conflict of Interest: The authors have no conflicts of interest to declare.

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