

# Are We Going to Survive Transplant During the Covid-19 Outbreak: Case Report

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## Research Article

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# Abstract

## Introduction

On March 10, the first case of coronavirus disease 2019 (COVID-19) was reported in Turkey; in the meantime, over 95 million confirmed cases with more than 2 million deaths have been reported worldwide.

## Case Presentation

After the identification of first COVID-19 (+) patient, our center conducted the management of selection and treatment of candidates and continued to perform cardiac transplantations. We herein present two cases after determination of patient zero in Turkey in order to highlight clinical implications by describing our clinic principle in the ethical knowledge of ISHLT COVID-19 Task force statement regarding heart transplantation (HTx).

## Conclusions

COVID-19 creates a challenge on donor selection and post-transplant management and immunosuppressive therapy. And, a question arises about continuing HTx due to risk of immunosuppressive therapy, as well as exposure during hospitalization.

## Introduction

COVID-19 creates a challenge on donor selection and post-transplant management and immunosuppressive therapy. Underlying heart and respiratory disease, advanced age and diabetes have been determined to play a crucial role in mortality, where as patients having immunosuppressive therapy were also reported to be at risk (1–3). Consequently, a question arises about continuing HTx due to risk of immunosuppressive therapy, as well as exposure during hospitalization.

## Case Presentation

The first case was a 42-year-old woman with ischemic cardiomyopathy waiting on the list since October 2018 and she has been in self-isolation since the beginning of plague. She had a history of ventricular fibrillation followed by cardiopulmonary resuscitation resulted from acute MI. At the time of hospital admission for surgery, she was clinically screened and CT imaging was evaluated. Finally, elective surgery was performed uneventfully with an ischemic time of 150 minutes on March 13. She was moved out of intensive care unit (ICU) on second postoperative day and discharged to home by postoperative day 7. Second patient, a 32-year-old woman, has been waiting at hospital since July 2019. She underwent Fontan circulation for uni-ventricular heart with tricuspid atresia 24-years ago. Her reverse transcriptase polymerase chain reaction (RT-PCR) test came negative and the assessment of CT was normal; eventually, urgent surgery was completed with ischemic time of 152 minutes on March 20. She was

extubated after 16 hours and discharged to ward on day 4. Recovery was uneventful and she was discharged home by day 16.

During recovery, average percentages of WBC and neutrophil were  $15.3 \pm 5.3 \times 10^9/L$  and  $82 \pm 12.7\%$  for first;  $15 \pm 8.4 \times 10^9/L$  and  $88 \pm 8.2\%$  for second patient, respectively. Demographic parameters prior to surgery were summarized in table.1. Both donors were from out of Istanbul without history of epidemiological exposure or high body temperature during hospitalization. Their CT scans were normal and both donors were detected negative for COVID-19. In the light of current information and guidance from ISHLT regarding COVID-19 pandemic, we do not make a change in induction and maintenance of immunosuppressive therapy (4). For initial phase of induction therapy, rabbit anti-thymocyte globulin was used once peroperatively due to its highly potent effects which may cause 'cytokine release syndrome' (5). Glucocorticoids were first-line agents for induction and maintenance therapy. In our transplant program, we use a quadruple-drug maintenance regimen consisting of calcineurin inhibitor (cyclosporine) lowering with everolimus, an anti-proliferative agent (mycophenolate mofetil) and a glucocorticoid (rapid tapered gradually) as renal protective strategy. Average cyclosporine and everolimus concentrations were  $100.6 \pm 12.8 \text{ng/mL}$  and  $4.3 \pm 1.08 \text{ng/mL}$  postoperatively. The patients never had lymphopenia in the outpatient clinic. Examination of renal and liver function (Urea, Creatinine, SGOT, SGPT) was normal. Surveillance biopsies were abolished against the risk of exposure at those that were not sensitized or had low risk for rejection. We prefer to use consecutive echocardiographic assessment for detection of allograft rejection. Swab specimens were collected prior to discharge of patients and reported negative.

## Conclusions

Describing out-brake as a pandemic, the organ transplant activity run into danger. Looking on the bright side, the experience from reviews of previous outbreaks on severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) suggests that immunosuppressed patients are not associated with higher risk of fatal complications compared to general population (2,6).

Our National pandemic coordination board, Ministry of Public Health, released recommendations for limiting all planned surgery; so we focused on more urgent patients, preserved the sources to more needy ones and tried to prevent potential spread among healthcare workers and families of patients. However, answer to whether transplant surgery should be performed or not is going to be diverse depending on the situation and epidemiology of virus in your area. We emphasized waitlist mortality risk and potential benefit for all listed hospitalized or at home patients, and identified selected patients that should not be postponed and also accepted good quality organs from proven donors to reduce long ICU stay and early graft dysfunction. In the light of an epidemiological study from Ren et al. (4), which showed that transplant patients taking appropriate precautions had low rate of COVID-19 infection, we evaluated our hospitalized patients and directed the medically stable ones on self-isolation at home. And it's just as well that we managed to perform transplantation in one of our self-isolated patients. We also considered alternatives like left ventricular assist devices; nevertheless, it should not be utilized in elective patients in order to limit resources or to avoid nosocomial infections (7).

Recent study from Italy showed stable transplantation activity in contrast to our decreasing donor activity (75%) compared to first quarter of last year (3). We aren't there yet every organ donor is routinely testing. Our protocol for the patients requiring HTx: 1. CT and rapid PCR for already hospitalized patients, 2. Clinical evaluation and CT for patients waiting at home, 3. Patients in elective list must transported privately and accompanied by one and same relative all the time, 4. Recipients and relatives were re-tested and received education for preventative precautions prior to discharge, 5. Donor must have no history of contact with suspected or confirmed COVID-19 patient and of travelling abroad over the past 30 days. 6. Donor must have no signs of pneumonia in CT or no positive nasopharyngeal swab result for COVID-19. 7. Separate the operation room, ICU and postoperative ward to avoid in-hospital disease transmission, 8. Organize shift schedule for related medical staff 9. Immunosuppressive therapy should be continued unless otherwise indicated to reduce or discontinue doses. Our detailed approach to heart transplantation during global pandemic has been described in Fig. 1. Donors who are positive for both clinical and epidemiological screenings are considered high risk to be used for transplantation. If donor was tested positive for COVID-19, the organs should not be used for transplant. In particular, CT has been widely recommended to clarify patients with suspected COVID-19 [2]. However, during global pandemic, the identification of COVID-19 pneumonia from pulmonary edema caused by heart failure was one of the major challenges for physicians. Most of the radiological features presented with COVID-19 can be seen in many systemic processes and multiple underlying medical comorbidities, concomitant infections and volume overload could influence the CT findings.

Eventhough fatality rate is low (1-8.6%), patients with cardiac comorbidities present more severe outcome of COVID-19 (3). We believe that patients having HTx are already used to social distancing and applying sanitization measures. Sharing knowledge and transparency with patients and other centers are important to come out with less damage through this pandemic.

## Declarations

### Conflict of Interest

The authors declare that they have no conflicts of interest

### Informed Consent

The patients have given their consents for the publication of this article

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## Tables

Table 1 is available in the Supplementary Files section.

## Figures

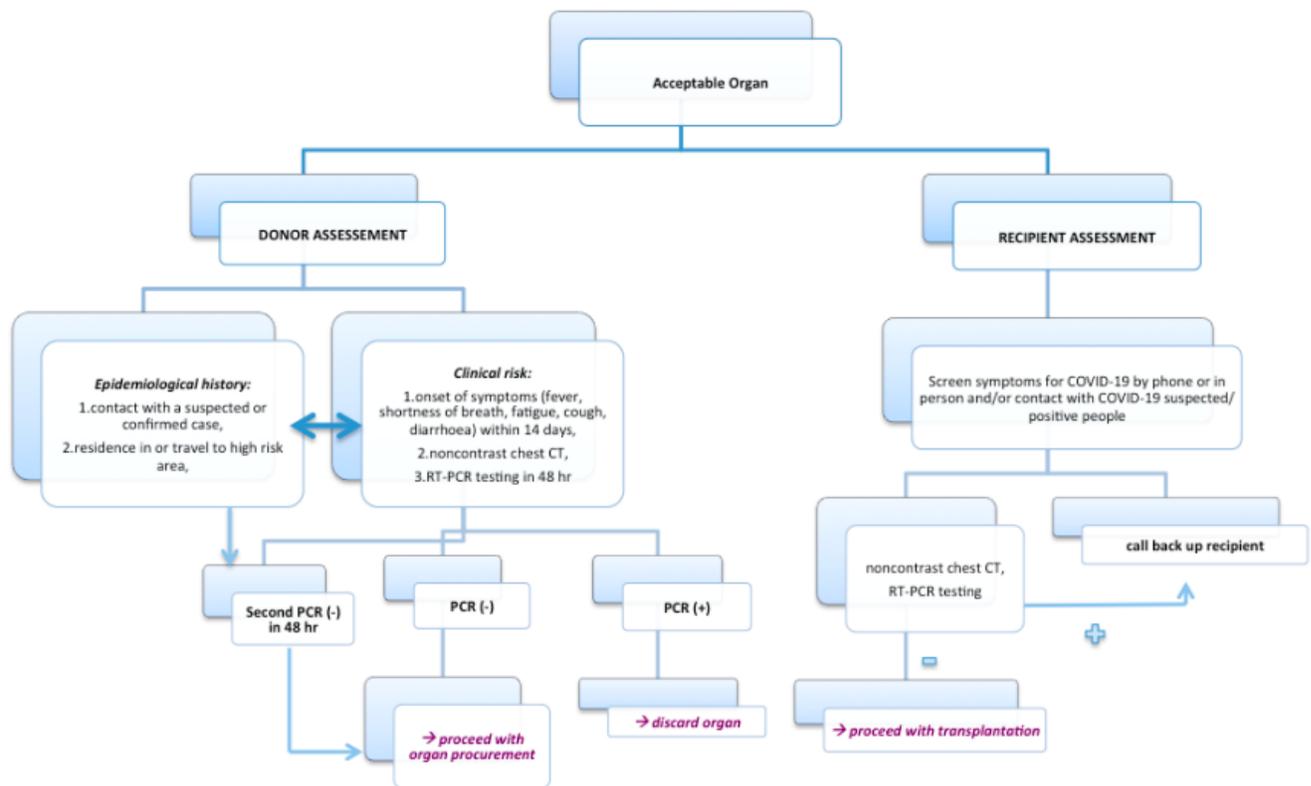


Figure 1

Our approach to heart transplantation during COVID-19.

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Table.1.pdf](#)