

# Successful heart transplantation in a patient who recovered from COVID-19

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## Abstract

Coronavirus disease-2019 has created unprecedented challenges for society, and specifically the medical community. While the pandemic continues to unfold, the transplant community has had to pivot to keep recipients, donors, and institutional transplant teams safe given the unique circumstances inherent to solid organ transplantation.

## KEYWORDS

COVID-19, heart transplantation

## 1 | INTRODUCTION

We present the case of a 63-year-old male who underwent successful orthotopic heart transplantation (OHT) after surviving infection with severe acute respiratory syndrome coronavirus 2 (coronavirus disease 2019 [COVID-19]). This is the first documented report of a COVID-19 survivor who subsequently underwent successful OHT.

COVID-19 continues to devastate countries and medical systems around the world, at points leading to an inability to continue to provide safe patient care due to systems limitations. As a result, some transplant centers have been forced to decrease their ability to offer transplantation in the midst of the pandemic. This has resulted in an overall decrease in the number of transplants performed in the United States coupled with an increased number of inactive patients on the UNOS waiting list.<sup>1</sup>

Waitlist and transplant recipients have an increased risk for acquiring COVID-19. It is speculated that this patient population is particularly vulnerable and at risk for more severe disease given their immunocompromised status (posttransplant) and the high prevalence of comorbidities (waitlist and posttransplant).<sup>2</sup> Given the uncertainty surrounding the risk of transplant patients contracting COVID-19 while on the waiting list or post-transplant, there is interest amongst the transplant community to characterize the patients trajectory should they become infected.

## 2 | CASE PRESENTATION

A 63-year-old male was admitted to our institution in May 2020 with shortness of breath and a history of ischemic cardiomyopathy resulting in New York Heart Association Class IV heart failure. In the process of multidisciplinary workup for consideration for heart transplant, he was found to be COVID-19 positive by polymerase chain reaction (PCR) assay. The test was repeated and confirmed positive.

He was relocated to the COVID-19 intensive care unit and isolated. Chest radiograph demonstrated a dense left lower lobe pneumonia which was treated with antibiotics. His heart failure was managed with dual inotropes and tailored diuresis.

After 2 weeks of isolation, he underwent repeat COVID-19 testing which was negative. His respiratory symptoms had improved, and his chest radiography and computed tomography scan showed resolution of the lower lobe infiltrate. As a result, workup was re-instituted for heart transplant candidacy. Right heart catheterization was obtained which revealed a pulmonary wedge pressure of 33 mmHg and a cardiac index of 1.44 L/min/m<sup>2</sup> despite dual inotropic therapy. The decision was made to place an intra-aortic balloon pump. He was listed as UNOS Status 2 for heart transplantation.

A suitable donor organ became available 72 h following the patient being listed for transplant. He was brought to the operating room and underwent successful OHT. His postoperative course was unremarkable. He was discharged on postoperative Day 17.

Final pathology of the specimen demonstrated ischemic disease with moderate myocyte hypertrophy and interstitial fibrosis.

### 3 | COMMENT

The COVID-19 pandemic poses a variety of challenges for transplant programs. Balancing the risk of waitlist mortality, the safety of the transplant team staff, and the unknown outcome of an immunosuppressed recipient contracting COVID-19 is difficult.

To our knowledge, a case of a patient awaiting heart transplant who contracts COVID-19, survives, and then undergoes successful OHT has not been reported in the literature. This case is of interest to demonstrate that OHT is still feasible in a recipient who has negative COVID-19 PCR before transplant in the setting of a prior positive test.

As the pandemic evolves, with the inevitable increase in numbers of patients with COVID-19 in the population, transplant centers will need to explore the implications of COVID-19 positivity in the pretransplant and immediate posttransplant period to continue to successfully provide heart transplant to our waitlist population.

This is the first patient described in the literature to survive COVID-19 and then undergo successful OHT. Our patient has no obvious sequela of COVID-19 infection and has been COVID negative since time of transplant.

As the global pandemic continues, this case demonstrates the safety and feasibility of continuing to provide OHT to patients who are survivors of COVID-19.

Further study is warranted to elucidate any impact of prior COVID-19 infection on immunosuppressive regimen or possible long standing pulmonary complications posttransplant. In addition, as the pandemic continues on, further institutional experiences surrounding time to wait from last negative COVID test before moving safely

forward with transplantation will help guide decision making about safety of transplant following recovery from COVID-19.

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### CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

### INSTITUTIONAL REVIEW BOARD APPROVAL OR WAIVER

No need for IRB approval for this study.

### PATIENT CONSENT STATEMENT

Consent was not obtained and waived.

### DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

### REFERENCES

1. Hsu JJ, Al-Saffar F, Ardehali R, et al. Heart transplantation in the early phase of the COVID-19 pandemic: a single-center case series. *Clin Transplant*. 2020;2020:e14042. <https://doi.org/10.1111/ctr.14042>
2. DeFilippis E, Farr M, Givertz M. Challenges in heart transplantation in the era of COVID-19. *Circulation*. 2020;141:2048-2051. <https://doi.org/10.1161/CIRCULATIONAHA.120.047096>

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