

# Retransplantation for COVID-19-related lung graft failure: A case report of successful outcome in a critically ill lung transplant recipient

Prince Ntiamoah, Marie Budev<sup>1</sup>, Jason Turowski, Charles Randall Lane<sup>1</sup>, Kenneth R. McCurry<sup>2</sup>

Departments of Pulmonary and Critical Care Medicine and <sup>2</sup>Thoracic and Cardiovascular Surgery, Cleveland Clinic Foundation, <sup>1</sup>Cleveland Clinic Foundation, Respiratory Institute, Pulmonary and Critical Care, Clinic, Cleveland, OHIO, USA

## Address for correspondence:

Dr. Charles Randall Lane,  
Department of Pulmonary and Critical Care Medicine, Cleveland Clinic Foundation, 9500 Euclid Ave, Cleveland 44195, Ohio, USA.  
E-mail: lanec2@ccf.org

Submission: 18-04-2023  
Accepted: 23-08-2023  
Published: 17-10-2023

## Access this article online

### Quick Response Code:



Website:  
www.thoracicmedicine.org

DOI:  
10.4103/atm.atm\_107\_23

## Abstract:

End-stage lung disease from nonrecovered COVID-19 acute respiratory distress syndrome has become an increasingly frequent indication for lung transplant. Although reports of lung transplant recipients (LTRs) with COVID-19 suggest an increased risk for hospitalization, respiratory failure, and death, little is known about retransplant for COVID-19-related lung graft failure. In this manuscript, we present a 49-year-old man who received bilateral lung retransplantation for COVID-19-related lung graft failure, 7½ years after his initial transplant for idiopathic pulmonary fibrosis. Our case suggests that retransplantation may be a viable option for critically ill LTRs with COVID-19-related graft failure, even in the presence of other organ dysfunction, provided that they are in good condition and have an immunologically favorable donor.

## Keywords:

Acute respiratory distress syndrome, COVID-19, lung retransplantation, lung transplant

The COVID-19 pandemic has had a significant impact on global health, leading to a high number of hospitalizations and deaths.<sup>[1]</sup> A significant complication of COVID-19 is the development of acute respiratory distress syndrome (ARDS) and a severe and life-threatening complication that can cause irreversible lung damage. End-stage lung disease from COVID-19 ARDS has emerged as a significant indication for lung transplantation.<sup>[2]</sup> A recent single-center report described 30 patients transplanted for COVID ARDS without any early mortality in the period observed.<sup>[3]</sup> However, the risk of hospitalization, respiratory failure, and death remains a concern for lung transplant recipients (LTRs) with COVID-19.<sup>[2,4,5]</sup> The retransplantation of COVID-19-related lung

graft failure is a challenging issue, and little is known about its outcome.

## Case Report

We present a 49-year-old man with excellent graft function 7½ years postbilateral lung transplant for idiopathic pulmonary fibrosis, who contracted COVID-19 before vaccine availability. Despite treatment with dexamethasone and remdesivir, he developed acute hypoxemic respiratory failure requiring intubation and ultimately tracheostomy due to inability to wean from mechanical ventilation. His course was additionally complicated by acute on chronic renal failure requiring renal replacement therapy and deep-vein thrombosis. However, he continued breathing spontaneously on the ventilator and was able to participate in physical therapy. Due to persistent hypoxemic

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow\_reprints@wolterskluwer.com

**How to cite this article:** Ntiamoah P, Budev M, Turowski J, Lane CR, McCurry KR. Retransplantation for COVID-19-related lung graft failure: A case report of successful outcome in a critically ill lung transplant recipient. Ann Thorac Med 2023;18:217-8.

respiratory failure and radiographic evidence of developing fibrosis, he was listed for retransplant 65 days after his COVID-19 diagnosis. Bronchoalveolar lavage fluid remained positive for SARS-CoV-2 for several weeks but was negative at the time of listing. Eight days after listing, he underwent bilateral lung retransplant through clamshell approach, utilizing intraoperative venoarterial extracorporeal membrane oxygenation support. The patient did not have any human leukocyte antigen (HLA) antibody at the time of transplant, and all seven mismatched HLA antigens from the first transplant were avoided. Postoperatively, he received induction with 4.5 mg/kg of rabbit antithymocyte globulin, followed by tacrolimus, mycophenolate, and prednisone. Posttransplant graft dysfunction score from time zero (T0) to 72 h remained at one. He was discharged from the intensive care unit on postoperative day (POD) 18, liberated from the ventilator on POD 23, and discharged to an acute rehabilitation hospital on POD 30. He did not have rejection on surveillance biopsies at any time point. *De novo* donor-specific HLA antibody to Cw2 (one of the HLA antigens) was detected on POD 10, but it declined to negative. Subjective and objective improvement of graft function was noted with subsequent follow-up, and his forced expiratory volume in 1 s at 1 year was 2.09 L (61% predicted). He has started the process of evaluation for kidney transplant.

## Discussion

Selecting LTRs with COVID-19-related graft failure who may be candidates for retransplantation can be challenging. LTRs who become critically ill with COVID-19 are likely to develop other organ dysfunction, such as renal failure, which can complicate their care and recovery.<sup>[4]</sup> In addition, the uncertainty about patients' recovery potential makes it difficult to determine the appropriate timing of listing. However, it is generally recommended that several weeks should be allowed to assess the potential for recovery.<sup>[3]</sup>

Our patient was more than 2 months into his illness at the time of listing for retransplantation and had developed acute-on-chronic renal failure requiring dialysis. Despite this, the patient was young, in good physical condition despite severe illness, and had the potential to undergo a kidney transplant once recovered from the lung transplant. Therefore, the decision was made to proceed

with retransplantation, even though there was uncertain potential for renal recovery.

The short-term success of the retransplantation, in this case, suggests that it is a viable option for critically ill LTRs with COVID-19-related graft failure who are in good condition and have an immunologically favorable donor, even in the presence of other organ dysfunction. However, given the novel nature of the COVID-19 pandemic and the limited data available, continued research is needed to better understand the risks and benefits of lung transplantation in this patient population.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

## References

1. Huang C, Huang L, Wang Y, Li X, Ren L, Gu X, *et al.* 6-month consequences of COVID-19 in patients discharged from hospital: A cohort study. *Lancet* 2021;397:220-32.
2. Aversa M, Benvenuto L, Anderson M, Shah L, Robbins H, Pereira M, *et al.* COVID-19 in lung transplant recipients: A single center case series from New York city. *Am J Transplant* 2020;20:3072-80.
3. Kurihara C, Manerikar A, Querrey M, Felicelli C, Yeldandi A, Garza-Castillon R Jr., *et al.* Clinical characteristics and outcomes of patients with COVID-19-associated acute respiratory distress syndrome who underwent lung transplant. *JAMA* 2022;327:652-61.
4. Messika J, Eloy P, Roux A, Hirschi S, Nieves A, Le Pavec J, *et al.* COVID-19 in lung transplant recipients. *Transplantation* 2021;105:177-86.
5. Heldman MR, Kates OS, Safa K, Kotton CN, Georgia SJ, Steinbrink JM, *et al.* COVID-19 in hospitalized lung and non-lung solid organ transplant recipients: A comparative analysis from a multicenter study. *Am J Transplant* 2021;21:2774-84.