Successful Liver Transplantation From a SARS-CoV-2 Positive Donor to a Positive Recipient: Potential Role of Monoclonal Antibodies

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The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic initially resulted in a decline in organ transplantation, including a 35.9% decrease in the United States.[1] Although there are many factors contributing to this, potential donors who tested positive for SARS-CoV-2 have been largely excluded from donation.

Simultaneously, there was uncertainty about safety of transplanting a recipient with coronavirus disease 2019 (COVID-19). Although there are emerging reports of liver transplantation from SARS-CoV-2-infected deceased donors,[2] optimal risk mitigation strategies are unclear. Herein, we report a case of liver transplantation from a SARS-CoV-2 positive deceased donor to a SARS-CoV-2 positive recipient who was managed with anti spike monoclonal antibodies. This report did not require review board approval.

Our patient was a 33 y-old female with adult-onset Still's disease, treated previously with canakinumab, admitted for severe acute-on-chronic liver failure of unclear etiology. She had experienced several months of relapsing elevations in liver biochemistries attributed to lobular hepatitis of unclear etiology. She developed jaundice with progressive encephalopathy over 3 wk, culminating in a clinical scenario consistent with subacute liver failure, with a calculated Model for End-stage Liver Disease-Sodium score of 35. Concurrently, multiple household contacts developed mild upper respiratory symptoms and were diagnosed with COVID-19. She had not undergone SARS-CoV-2 vaccination.

Upon admission, the patient was jaundiced, encephalopathic, and coagulopathic, although normoxic, and her chest radiograph did not show infiltrates. Urgent evaluation for liver transplantation was initiated. Nasopharyngeal SARS-CoV-2 polymerase chain reaction was positive (cycle threshold N 33.0, open reading frame 27.6; ARIES SARS-CoV-2 assay, Luminex Corp), and serum SARS-CoV-2 nucleocapsid antibody was negative. Because of high-risk comorbidities and likely impending transplantation, she received casirivimab and imdevimab on hospital day 1. She received an organ offer for liver transplantation on hospital day 4. The donor was incidentally found to have a positive SARS-CoV-2 polymerase chain reaction on routine donor screening without evidence of clinical disease. The donor had died from trauma, and the liver was normal. After shared decision-making, she proceeded with orthotopic liver transplantation and received a 5-d course of remdesivir after transplantation. She received induction immunosuppression with methylprednisolone and maintenance immunosuppression with tacrolimus, mycophenolate mofetil, and prednisone. She did receive augmented prophylactic anticoagulation with enoxaparin 30 mg twice per day; however, this was complicated by perihepatic hematoma requiring reoperation for evacuation and hemostasis on posttransplant day 8. She experienced no thrombotic complications. She was dismissed from the hospital 11 d following transplantation and remained in isolation for 20 d posttransplantation. She did not develop respiratory symptoms or abnormal lung imaging in 30 d of follow-up.

There is currently little experience transplanting a SARS-CoV-2 positive donor to a SARS-CoV-2 positive recipient.[3] We utilized anti spike monoclonal antibodies to mitigate the risk of progression to severe infection while awaiting transplantation. This treatment has been associated with good outcomes in solid organ transplantation[4] and has been utilized as postexposure prophylaxis.[5] We propose anti spike monoclonal antibodies may have a role in mitigating the risks of SARS-CoV-2 donor-derived infection and progression to severe disease posttransplantation. Our case highlights that donor SARS-CoV-2 positivity does not necessarily preclude nonlung organ transplantation, and risks of transmission must be balanced with the risk of death

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while remaining on the transplant waitlist. SARS-CoV-2-directed monoclonal antibody therapy and/or preemptive remdesivir administration may have roles in this setting; however, additional studies on strategies to mitigate donor-derived COVID-19 are necessary.

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