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# Allogeneic Kidney Transplantation After COVID-19: A Case Report

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## ABSTRACT

**Background.** Patients undergoing organ transplantation are immunosuppressed and already at risk of various diseases. We report about a patient who underwent ABO-incompatible kidney transplantation after coronavirus disease 2019 (COVID-19) without a recurrence of infection.

**Case Report.** A 68-year-old woman presented with end-stage renal failure owing to primary autosomal dominant polycystic kidney disease; accordingly, hemodialysis was initiated in September 2020. Her medical history included bilateral osteoarthritis, lumbar spinal stenosis, hypertension, and hyperuricemia. In mid-January 2021, she contracted severe acute respiratory syndrome coronavirus 2 infection from her husband. Both of them were hospitalized and received conservative treatment. Because their symptoms were mild, they were discharged after 10 days. The patient subsequently underwent ABO-incompatible kidney transplantation from her husband who recovered from COVID-19 in March 2021. Before kidney transplantation, her COVID-19 polymerase chain reaction test was negative, confirming the absence of pre-existing COVID-19 immediately before the procedure. Computed tomography revealed no pneumonia. Initial immunosuppression was induced by administering tacrolimus, mycophenolate mofetil, methylprednisolone, basiliximab, rituximab, and 30 g of intravenous immunoglobulin. Double-filtration plasmapheresis and plasma exchange were performed once before ABO-incompatible kidney transplantation. The renal allograft functioned immediately, and the postoperative course was normal without rejection. COVID-19 did not recur. In addition, her serum creatinine levels and renal function had otherwise remained stable.

**Conclusion.** Living kidney transplantation was safely performed in a patient with COVID-19 without postoperative complications or rejection. During the COVID-19 pandemic, the possibility of severe acute respiratory syndrome coronavirus 2 infection during transplantation surgery must be considered.

**P**ATIENTS undergoing organ transplantation are immunosuppressed and already at risk of various diseases. We report about a patient who underwent ABO-incompatible kidney transplantation after coronavirus disease 2019 (COVID-19) without a recurrence of infection.

## CASE PRESENTATION

A 68-year-old woman presented with end-stage renal failure owing to primary autosomal dominant polycystic kidney

The authors declare no conflicts of interest.

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

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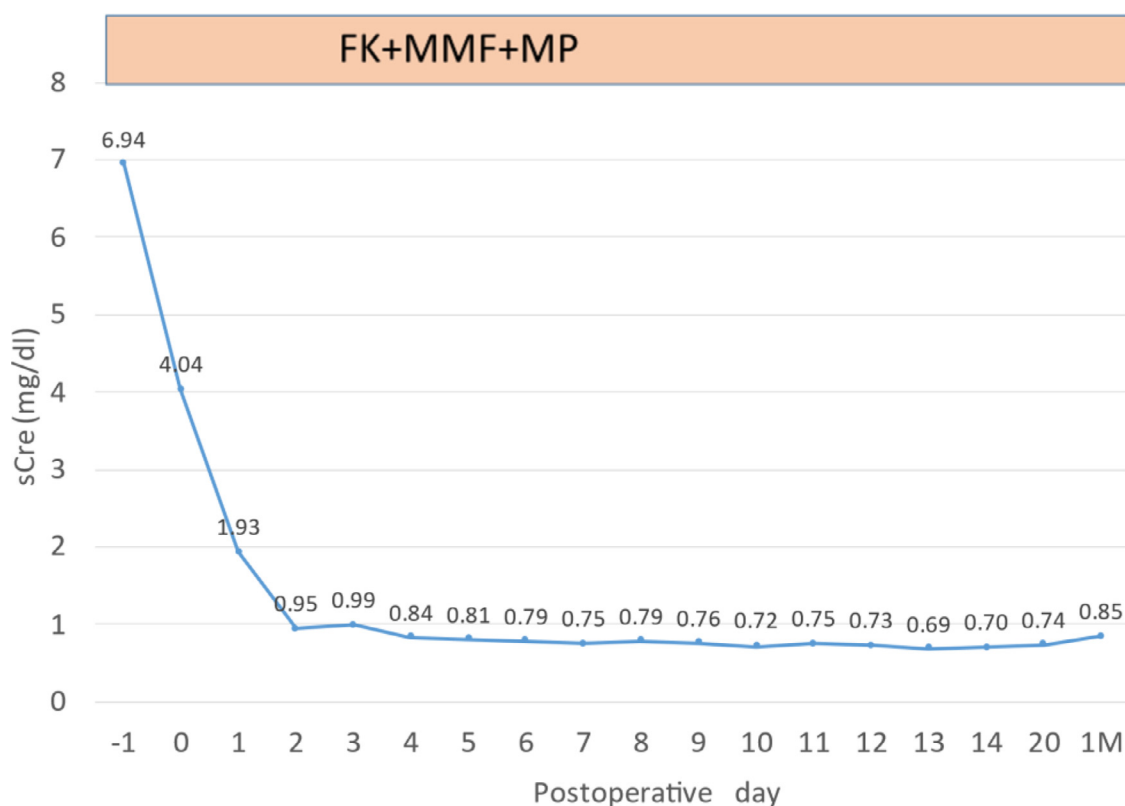
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disease; accordingly, hemodialysis was initiated in September 2020. Her medical history included bilateral osteoarthritis, lumbar spinal stenosis, hypertension, and hyperuricemia. In mid-January 2021, she contracted severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection from her husband, and both of them were hospitalized and received conservative treatment. Because their symptoms were mild, they were discharged after 10 days. The patient subsequently underwent ABO-incompatible kidney transplantation from her husband who recovered from COVID-19 in March 2021. Before kidney transplantation, she had a negative COVID-19 polymerase chain reaction (PCR) test result, confirming the absence of pre-existing COVID-19 immediately before the procedure. Computed tomography revealed no pneumonia. Immunosuppression was induced by administering tacrolimus, mycophenolate mofetil, methylprednisolone, basiliximab, rituximab, and 30 g of intravenous immunoglobulin. Double-filtration plasmapheresis and plasma exchange were performed once before the ABO-incompatible kidney transplantation. The renal allograft functioned immediately, and the postoperative course was uneventful, without rejection (Fig 1). COVID-19 did not recur; moreover, her serum creatinine levels and renal function had remained stable. This was a rare case of kidney transplantation after SARS-CoV-2 cross-infection.

## DISCUSSION

Varotti et al reported the first case of kidney transplantation after a recent COVID-19 illness [1]. The American Society of Transplantation recommends performing living kidney transplantation only under acceptable conditions [2]. Our patient had a negative COVID-19 PCR test result during the retest, and symptoms had resolved. Moreover, the initial SARS-CoV-2 infection occurred between 21 and 90 days before the kidney donation, irrespective of the PCR retest results [2]. Furthermore, a 19-center retrospective study from India reported 31 cases of living donor kidneys from COVID-19-positive donors. For organ donation, the patient must exhibit a full recovery from symptoms at least 28 days before donation and should have tested negative by PCR twice, including immediately before surgery [3]. The COVID-19 PCR-negative status of the donor was confirmed before surgery, and he tested negative for COVID-19 approximately 60 days after symptom onset. Thereafter, we examined if the patient was a stable candidate for kidney transplantation surgery after COVID-19.

Complete recovery from COVID-19 symptoms and a positive SARS-CoV-2 IgG antibody test result are prerequisites for qualifying as a kidney transplant candidate [3]. In most patients, SARS-CoV-2 becomes undetectable 10 to 20 days after the symptoms disappear [4,5]. Our patient underwent living kidney



**Fig 1.** Successful clinical course, uncomplicated by organ rejection, after kidney transplantation. FK, tacrolimus; MMF, mycophenolate mofetil; MP, methylprednisone.

transplantation 2 months after complete recovery from COVID-19. Cases of a direct donor to recipient COVID-19 transmission have not been reported in the literature. In addition, the time required for definite viral clearance in COVID-19 remains unknown.

#### CONCLUSION

Living kidney transplantation was safely performed in a patient with COVID-19, without postoperative complications or rejection. During the COVID-19 pandemic, the possibility of SARS-CoV-2 infection during transplantation surgery must be considered.

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