

9. Jabłoński S, Kordiak J, Wcisło S, Terlecki A, Misiak P, Santorek-Strumiłło E, et al. Outcome of pleurodesis using different agents in management prolonged air leakage following lung resection. *Clin Respir J*. 2018;12:183–92, <http://dx.doi.org/10.1111/crj.12509>.
10. Gulcan E, Korkmaz M, Kıdır V, Sanal B, Vural AH. Treatment with Povidone- Iodine of Pleural Effusion Due to Diaphragmatic Defect in a Patient Undergoing Peritoneal Dialysis. *Perit Dial Int*. 2016;36:233, <http://dx.doi.org/10.3747/pdi.2015.00263>.

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SARS-CoV-2 infection on the kidney transplant waiting list: Can a patient be transplanted after COVID-19?

Infección por SARS-CoV-2 en lista de espera de trasplante renal: ¿se puede trasplantar un paciente con antecedente de COVID-19?

Dear Editor,

The SARS-CoV-2 pandemic has had a very negative impact on kidney transplant (KT) programmes in our area.¹ The high mortality rate among KT patients, particularly in the initial post-KT period, led to the suspension of activity in many centres during the first months of the pandemic. As transplant programmes have resumed, new issues have arisen. One of these is access to KT in patients with a history of SARS-CoV-2 infection. So far there are only two published cases,^{2,3} and none has been reported here in Spain. We present the case of a patient with a history of COVID-19 who subsequently had a KT.

This is a 70-year-old male, blood group A positive, with chronic kidney disease due to chronic tubulointerstitial nephritis, on regular haemodialysis. He was selected as a potential KT recipient on 09/07/2020. When he arrived at the hospital, he had a SARS-CoV-2 PCR protocol performed on nasopharyngeal exudate, obtaining a positive result with low viral load. The patient was asymptomatic and reported no contact with confirmed cases of COVID-19. Blood tests showed no abnormalities and no infiltrates were seen on chest X-ray. In view of the patient's positive PCR result, the KT was ruled out

and, in the absence of severity data, he was discharged for isolation at home.

The PCR was repeated 24 hours later, coming back negative. However, SARS-CoV-2 serology showed positive for IgG and negative for IgM. At that point, he was removed from the KT waiting list (WL) and a weekly PCR follow-up protocol was started. In order to reinstate the patient on the WL, it was decided to confirm negative PCR in 3 consecutive samples.

IgG became negative after two weeks (30/07/2020), while PCR results continued to be positive (Table 1). On 04/09/2020, he was put back on the WL, and on 13/09/2020, he was selected again as a possible KT recipient from a cadaveric donor. However, the PCR performed pre-KT was positive again, so he was ruled out and once again removed from the WL. The patient was finally reinstated on the WL on 09/10/2020 and received a KT from a cadaveric donor on 30/10/2020. He had a negative PCR on admission and in the subsequent repeat tests carried out routinely every 48 hours and then weekly during the post-KT period. At present he is doing well, with no SARS-CoV-2-related complications.

This is the first documented case in which positive PCR for SARS-CoV-2 was identified on admission of a patient as a potential KT recipient. Our patient was completely asymptomatic, which made it difficult to establish the time line of the infection. However, the viral load was low, there were no infiltrates on the chest X-ray and the serology was consistent

Table 1 – Changes in PCR and SARS-CoV-2 serology performed on the patient from identification of the virus (09/07/2020) to kidney transplantation (30/10/2020) and beyond.

	09/07/2020	10/07/2020	10/07/2020	16/07/2020	15/10/2020	23/07/2020	30/07/2020	06/08/2020	13/08/2020	20/08/2020	27/08/2020	03/09/2020	13/09/2020
PCR SARS-CoV-2	+	-	-	-	+	+	-	-	+	-	-	-	+
IgM	-	+	-	+	-	-	-	-	-	-	-	-	-
IgG	+	-	-	-	-	-	-	-	-	-	-	-	-
PCRSARS-CoV-2	-	-	-	-	-	-	-	-	-	-	-	-	-
IgM	-	-	-	-	-	-	-	-	-	-	-	-	-
IgG	-	-	-	-	-	-	-	-	-	-	-	-	-

with resolved or resolving acute infection according to Spanish Ministry of Health recommendations.⁴ Nonetheless, the mortality rate for SARS-CoV-2 infection in KT patients is high, especially in the immediate post-KT period. Data from the Spanish COVID-19 and KT registry suggest that the post-KT stage at the time of infection is a risk factor for mortality,⁵ so guaranteeing the patient is negative prior to KT is a priority for performing the procedure safely. For our patient, as PCR in nasopharyngeal exudate can give a false-negative result in 30-40% of cases,⁶ we could not be certain that the samples in which no RNA was detected were really negative or that in the positive samples, all that had been detected was virus gene fragments. Therefore, although we had no prior evidence to support the decision, to maximise safety, we decided that three consecutive negative PCR tests would be required before reinstating the patient on the WL.

Another potential issue was the risk of reinfection. Long-term immunity after SARS-CoV-2 infection is the subject of study as it could be transitory and the antibody titre tends to decrease over time.^{7,8} It has also been reported that the serological response of subjects who have had asymptomatic infection or only mild symptoms is shorter lasting, especially in patients with conditions such as chronic kidney disease, who are at greater risk of reinfection.⁷⁻⁹ Our patient, in whom the antibodies disappeared rapidly, is an example of this situation. Moreover, the threshold above which long-term immunity is generated has not yet been established.¹⁰ We therefore think it is important that patients with a history of COVID-19 who are KT recipients undergo very close monitoring by serial PCR for possible SARS-CoV-2 reinfection.

In conclusion, a history of COVID-19 should not contraindicate KT, but we believe that negative PCR should be confirmed by repeated tests before and after the procedure to guarantee the safety of the transplant patient.

REFERENCES

1. COVID-19: Impacto en la actividad de donación y trasplantes [Internet]. Organización Nacional de Trasplantes 2020 [citado 5 de diciembre de 2020]. Disponible en: <http://www.ont.es/infesp/Paginas/Impacto.tx.aspx>.
2. Varotti G, Dodi F, Garibotto G, Fontana I. Successful kidney transplantation after COVID-19. *Transpl Int.* 2020;33:1333-4, <http://dx.doi.org/10.1111/tri.13703>.
3. Singh N, Tandukar S, Zibari G, Naserr MS, Amiri HS, Samaniego-Picota MD. Successful simultaneous pancreas and kidney transplant in a patient post-COVID-19 infection. *Kidney Int.* 2020;98:1615-6, <http://dx.doi.org/10.1016/j.kint.2020.09.004>.
4. Ministerio de Sanidad. Interpretación de las pruebas diagnósticas frente a SARS-CoV-2. 2020. Versión 2 de 24 de abril de 2020 [citado el 5 diciembre de 2020]. Disponible en: https://www.mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov/documentos/INTERPRETACION_DE.LAS.PRUEBAS.pdf.
5. Crespo M, Mazuecos A, Rodrigo E, Gavela E, Villanego F, Sánchez-Álvarez E, et al. Respiratory and Gastrointestinal COVID-19 Phenotypes in Kidney Transplant Recipients. *Transplantation.* 2020;104:2225-33, <http://dx.doi.org/10.1097/TP.0000000000003413>.

6. Kang H, Wang Y, Tong Z, Liu X. Retest positive for SARS-CoV-2 RNA of “recovered” patients with COVID-19: Persistence, sampling issues, or re-infection? *J Med Virol.* 2020;92:2263–5, <http://dx.doi.org/10.1002/jmv.26114>.
7. Kellman P, Barclay W. The dynamics of humoral immune responses following SARS-CoV-2 infection and the potential for reinfection. *J Gen Virol.* 2020;101:791–7, <http://dx.doi.org/10.1099/jgv.0.001439>.
8. Chan PKS, Lui G, Hachim A, Ko RLW, Boon SS, Li T, et al. Serologic Responses in Healthy Adult with SARS-CoV-2 Reinfection, Hong Kong, August 2020. *Emerg Infect Dis.* 2020;26:3076–8, <http://dx.doi.org/10.3201/eid2612.203833>.
9. Munoz Mendoza J, Alcaide ML. COVID-19 in a patient with end-stage renal disease on chronic in-center hemodialysis after evidence of SARS-CoV-2 IgG antibodies. Reinfection or inaccuracy of antibody testing. *IDCases.* 2020;22:e00943, <http://dx.doi.org/10.1016/j.idcr.2020.e00943>.
10. Poonia B, Kottlil S. Immune Correlates of COVID-19 Control. *Front Immunol.* 2020;11:569611, <http://dx.doi.org/10.3389/fimmu.2020.569611>.

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Successful kidney transplantation after COVID-19 infection in two cases

Trasplante de riñón exitoso después de la infección por COVID-19 en dos casos

Dear Editor:

We hereby report two successful kidney transplants done during the pandemic of COVID-19. The first case was a 44-year-old male chronic kidney disease stage 5 secondary to diabetic nephropathy on haemodialysis, with left arteriovenous fistula as vascular access, who presented with myalgias for one day. There was no associated cough, sputum, fever or loss of smell. He was diagnosed to be positive for COVID-19 reverse transcriptase polymerase chain reaction (RT-PCR, cobas[®] SARS-CoV-2 test, Roche Diagnostics). Subsequently, he was diagnosed to have COVID-19 pneumonia (Fig. 1) and was treated for same with dexamethasone, oxygen support (oxygen saturations 87% at the time of oxygen initiation) and other symptomatic treatment. He improved clinically and was tested negative for COVID-19 PCR twice over next two weeks. Subsequently, serum IgG titres against SARS-CoV-2 (done at 2 weeks after the initial diagnosis) by chemiluminescence enzyme immunoassay (CLIA, CPC Diagnostics) were positive. A deceased donor kidney was offered and a calculated and explained risk was taken considering his recent recovery from COVID-19 pneumonia and the severe

nature of his condition. The patient underwent a successful deceased donor kidney transplant after 4 weeks of initial diagnosis of COVID-19 with a negative pre-operative RT-PCR for SARS-CoV-2 and did not require any additional dialysis post-transplant. Basiliximab induction with triple drug immunosuppression consisting of prednisone, tacrolimus and mycophenolate mofetil was used. His post-operative period was uneventful and was discharged with a good graft function. He remains well at last updated follow-up of 15 weeks (at the time of writing this report) post-transplant with an eGFR of 91 ml/min/1.73 m² (Fig. 2). His current daily immunosuppression included prednisolone 10 mg, mycophenolate mofetil 1500 mg and tacrolimus 7 mg.

The second case was a 35-year-old female, on haemodialysis and was being worked up for live related kidney transplant, with her sister as prospective donor. Unfortunately, both the donor and the recipient developed fever, sore throat, myalgia and tested positive for COVID-19 by RT-PCR. Luckily, the disease course was not severe, and they only required quarantine and symptomatic treatment. Both donor and recipient were negative for COVID-19 RT-PCR done at 1, 2 and 6 weeks. However, both of them were positive for IgG titres against SARS-CoV-2 (by CLIA) at 6 weeks. A laparoscopic left kidney donor nephrectomy was then per-