# Hematopoietic Stem Cell Transplantation to a Patient with Acute Myeloid Leukemia from a Sibling Donor Positive for SARS-CoV-2 by RT-PCR Test

## SARS-CoV-2 RT-PCR Testi Pozitif Kardeş Donörden Akut Myeloid Lösemili Bir Hastaya Hematopoetik Kök Hücre Nakli

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**To the Editor,**

Hematopoietic stem cell transplantation (HSCT) is the preferred treatment modality in cases of high-risk pediatric acute myeloid leukemia (AML). However, due to the ongoing coronavirus disease-2019 (COVID-19) pandemic, there is a risk that stem cell donors may be positive for SARS-CoV-2 by reverse transcription polymerase chain reaction (RT-PCR) and that the ability to find suitable donors will be impacted [1,2]. In addition, it has been reported that the virus can be found in the blood of patients infected with SARS-CoV-2 [3]. Stem cell collection is not recommended by the European Society for Blood and Marrow Transplantation or other international organizations when the donor's RT-PCR test is positive for SARS-CoV-2 [1,2]. However, in the literature, cases of HSCT performed with SARS-CoV-2-positive donors due to necessity have been reported for a small number of patients [4,5,6]. In this letter, we present the case of a patient with high-risk AML who underwent HSCT from a fully HLA-matched 22-year-old sibling with SARS-CoV-2 positivity by RT-PCR test. Considering that the COVID-19 pandemic is still ongoing with the emergence of new mutations, we wanted to share this experience with colleagues who may encounter similar situations.

A 15-year-old girl with a diagnosis of AML-M4 was included in the high-risk AML group due to monosomy-7 positivity. She received the first four blocks of the AML-BFM 2019 treatment protocol (cytarabine, idarubicin, and etoposide in the first treatment block; high-dose cytarabine and mitoxantrone in the second treatment block; cytarabine and idarubicin in the third treatment block; and high-dose cytarabine and mitoxantrone in the fourth treatment block) and good response was obtained. Before transplantation, her bone marrow was in complete remission morphologically. Minimal residual disease as measured by flowcytometry was below 1%. Monosomy-7 disappeared after the first block of induction therapy and was also negative before transplantation. A nasopharyngeal swab from the donor before conditioning began was negative for SARS-CoV-2 by RT-PCR. Intravenous busulfan (3.2 mg/kg/day, days -7 to -4), fludarabine (30 mg/m$^2$/day, days -7 to -3), and melphalan (140 mg /m$^2$/day, day -1) were administered as myeloablative conditioning. However, the donor's RT-PCR on the day before the transplant was positive for SARS-CoV-2. The donor was asymptomatic and did not receive any medication for COVID-19. There was no chance of finding another donor for the patient at this stage. The transplant was delayed 1 day and the donor's SARS-CoV-2 test performed 2 days after the previous test was again found to be positive. Since the patient had serious infectious conditions during AML treatment, it was decided to proceed with the transplant considering that the risk of serious infection would increase significantly if the transplantation was not performed at this time and the bone marrow remained aplastic.

Following all personal protection rules issued by all relevant health institutions, CD34+ peripheral blood stem cells were collected from the donor by apheresis and were transfused to the patient on the same day without any manipulation. The patient and her accompanying mother wore appropriate personal protective equipment during the transplantation and did not develop any fever or other COVID-related symptoms. Cyclosporine A (3 mg/kg/day, intravenous) and methotrexate (10 mg/kg/day, on days 1, 3, and 6) were used for graft-versus-host disease prophylaxis. Ciprofloxacin, voriconazole, and acyclovir were used for infection prophylaxis. Neutrophil engraftment occurred on day 14 and platelet engraftment on day 16. The patient underwent a weekly SARS-CoV-2 test after transplantation and all results were negative. Bone marrow examination showed 100% donor chimerism at the end of the fourth week. The patient is currently alive and healthy in the fifth month after transplantation.

In conclusion, this case supports the reports in the literature that hematopoietic stem cells from asymptomatic SARS-CoV-2-positive donors may be safe.

**Keywords:** Acute myeloid leukemia, COVID-19, Hematopoietic stem cell transplantation

**Anahtar Sözcükler:** Akut myeloid lösemi, COVID-19, Hematopoietik kök hücre nakli

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## References

1. Ljungman P, Mikulska M, de la Camara R, Basak GV, Chabannon C, Corbacioglu S, Duarte R, Dolstra H, Lankester AC, Mohty M, Montoto S, Murray J, de Latour RG, Snowden JA, Yakoub-Agha I, Verhoeven B, Kröger N, Styczynski J, for the European Society for Blood and Marrow Transplantation. The challenge of COVID-19 and hematopoietic cell transplantation; EBMT recommendations for management of hematopoietic cell transplant recipients, their donors, and patients undergoing CAR T-cell therapy. Bone Marrow Transplantation 2020;55:2071-2076.
2. Waghmare A, Abidi MZ, Boeckh M, Chemaly RF, Dadwal S, Boghdadly Z, Kamboj M, Papanicolaou GA, Pergam SA, Shahid Z. Guidelines for COVID-19 management in hematopoietic cell transplantation and cellular therapy recipients. Biol Blood Marrow Transplant 2020;26:1983-1994.
3. Chang L, Yan Y, Wang L. Coronavirus disease 2019: coronaviruses and blood safety. Transfus Med Rev 2020;34:75-80.
4. Anurathapan U, Apiwattanakul N, Pakakasama S, Pongphitcha P, Thitithanyanont A, Pasomsub E, Hongeng S. Hematopoietic stem cell transplantation from an infected SARS-CoV2 donor sibling. Bone Marrow Transplant 2020;55:2359-2360.
5. Lázaro Del Campo P, de Paz Arias R, Ramírez López A, de la Cruz Benito B, Humala Barbier K, Sánchez Vadillo I, López de la Guía A, de Soto Álvarez T, Jiménez Yuste V, Canales Albendea M. No transmission of SARS-CoV-2 in a patient undergoing allogeneic hematopoietic cell transplantation from a matched-related donor with unknown COVID-19. Transfus Apher Sci 2020;59:102921.
6. Leclerc M, Fourati S, Menouche D, Challine D, Maury S. Allogeneic haematopoietic stem cell transplantation from SARS-CoV-2 positive donors. Lancet Haematol 2021;8:e167-169.



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