A Different Kind of Stem Cell Cure

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A man dubbed the Geneva Patient may be the sixth person to be functionally cured of HIV after a stem cell transplant for cancer treatment. But unlike the other five, his donor did not have a rare mutation, known as CCR5-delta32, that prevents the virus from entering cells.

The man, who was diagnosed with HIV in 1990, received chemotherapy and radiation followed by a stem cell transplant to treat aggressive sarcoma in July 2018. He maintained viral suppression until November 2021, when he stopped his antiretrovirals in a closely monitored treatment interruption. Twenty months later, he still has undetectable HIV in his blood, and researchers have been unable to find intact virus in his T cells or bone marrow, according to a report at the International AIDS Society Conference on HIV Science in July.

“We cannot exclude that there is still some virus present, so there may be viral rebound in the future, although we hope this situation of viral remission remains permanent,” says Asier Sáez-Cirión, PhD, of Institut Pasteur in Paris.

Researchers are working to learn why this man was apparently cured after a so-called wild-type stem cell transplant while previous attempts have failed. In 2013, hopes were raised when two men in Boston appeared to be controlling HIV after wild-type stem cell transplants, but they ultimately experienced viral rebound three and eight months after stopping antiretrovirals.

The Geneva Patient developed acute and chronic graft-versus-host disease—when donor immune cells attack the recipient’s body—which was treated with various immunosuppressive drugs, including ruxolitinib (see page 14). The fact that he used on-demand pre-exposure prophylaxis (PrEP) on two occasions might also be important.

Stem cell transplants are too risky for people who do not need them to treat life-threatening cancer, but cases like this offer clues that could help scientists develop strategies that lead to a more widely applicable functional cure.
