HIV Remission After Allogeneic Hematopoietic Stem Cell Transplant from CCR5Δ32/Δ32 Sibling Donor

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BACKGROUND

A few cases of HIV remission after allogeneic hematopoietic stem cell transplantation (HSCT) have been published, both with and without the CCR5Δ32/Δ32 mutation. Further reports of HIV remission are crucial to understand HIV persistence and to design cure strategies.

The Oslo patient is in remission 48 months after hematopoietic stem cell transplant and 24 months without ART.
Possible mechanisms include:
- *CCR5 Δ32/Δ32* donor
- *Full donor chimerism* in bone marrow, gut and blood
- Prolonged *graft versus host disease*
- *JAK inhibitor ruxolitinib* and other immunomodulators

METHODS

We quantified the HIV reservoir in blood and gut by intact proviral DNA assay (IPDA), proviral HIV DNA by droplet digital PCR (ddPCR), and viral outgrowth assay (qVOA) and examined donor chimerism, HIV-specific T cell responses, serum avidity and western blot up to 24 months post-analytical treatment interruption (ATI).

RESULTS

A 58-year-old male with a 14-year history of HIV-1 clade B, CCR5 tropism and suppressed viremia for 10 years underwent HSCT for myelodysplastic syndrome with a graft from his HLA-identical CCR5Δ32/Δ32 brother.

He developed severe acute and prolonged graft versus host disease (GvHD) and was treated with immunosuppressive drugs, including the JAK inhibitor ruxolitinib (Fig. 2). Complete donor chimerism in peripheral blood was documented by day 90 and later in bone marrow and gut-associated lymphoid tissues (GALT).

After 24 months, ART was stopped, and after 24 months without ART, no intact HIV DNA was detected in blood or GALT. Importantly, no replication competent virus was detected by qVOA (Fig. 1). HIV-specific T cell responses were absent (Fig 3). The western blot displayed waning HIV-1-specific antibody responses (Fig. 4) and serum HIV avidity showed weak functional affinity comparable with historical cure cases (Fig. 5).

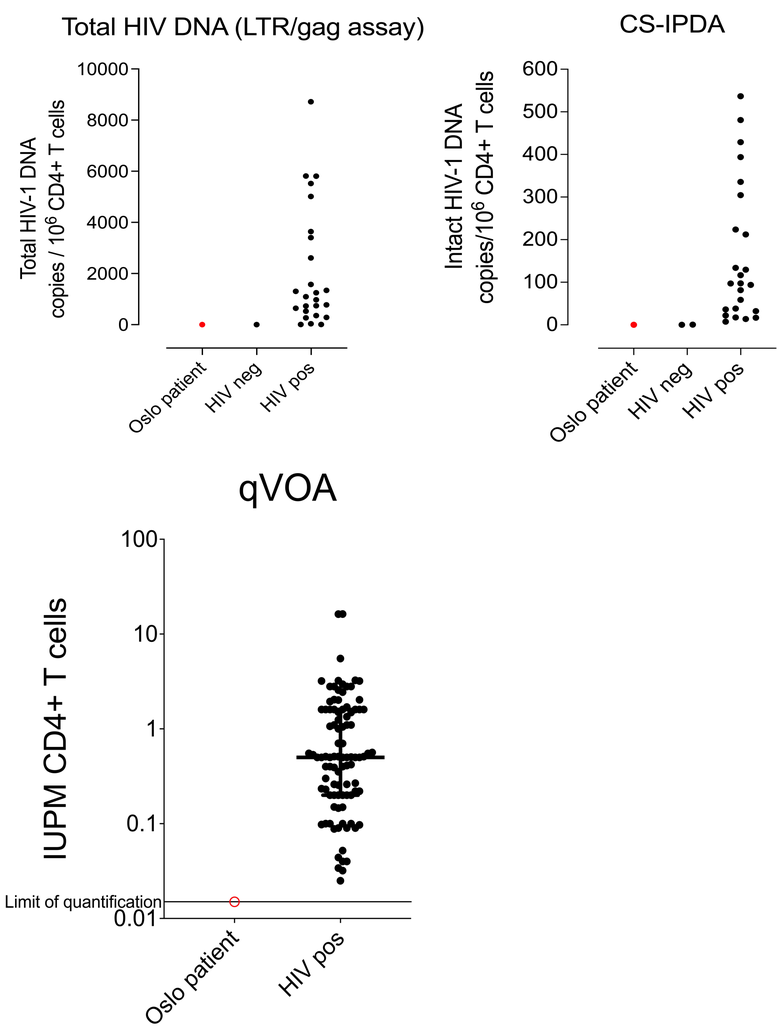

Fig. 1. Total HIV DNA, intact proviral DNA (IPDA) and quantitative viral outgrowth assay (qVOA).

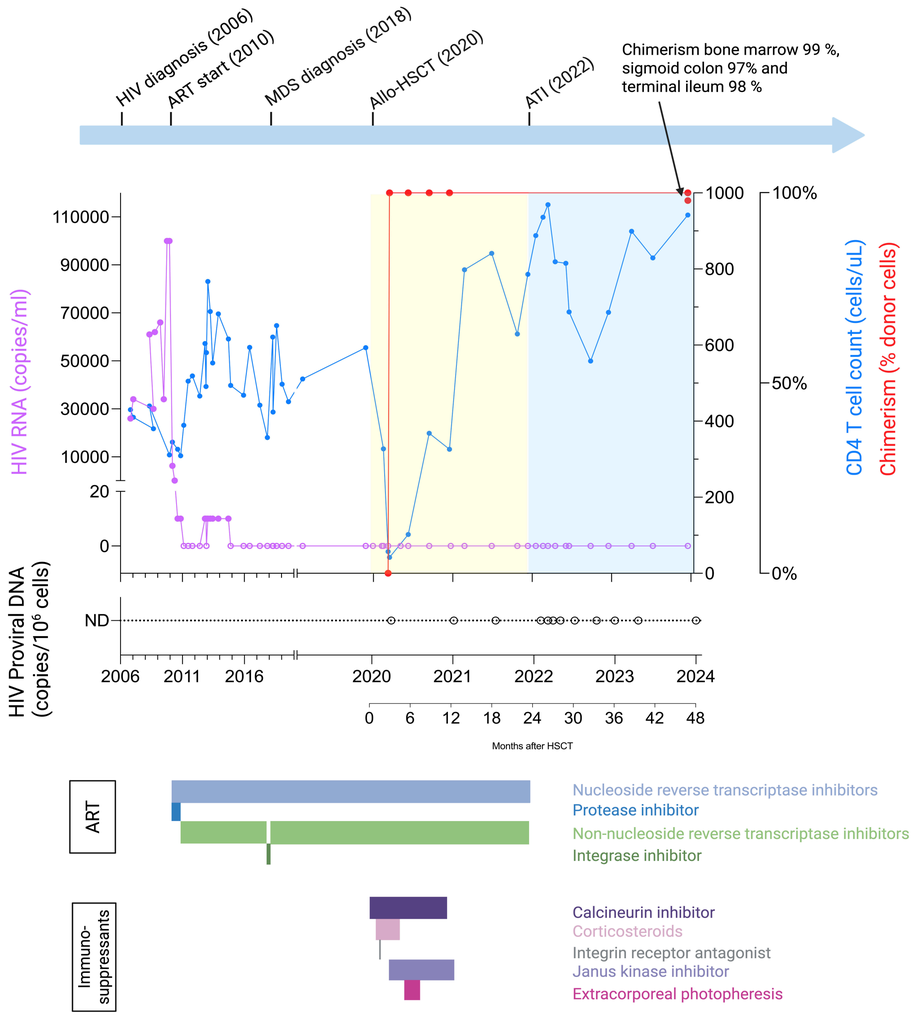

Fig. 2. Clinical course and treatment.

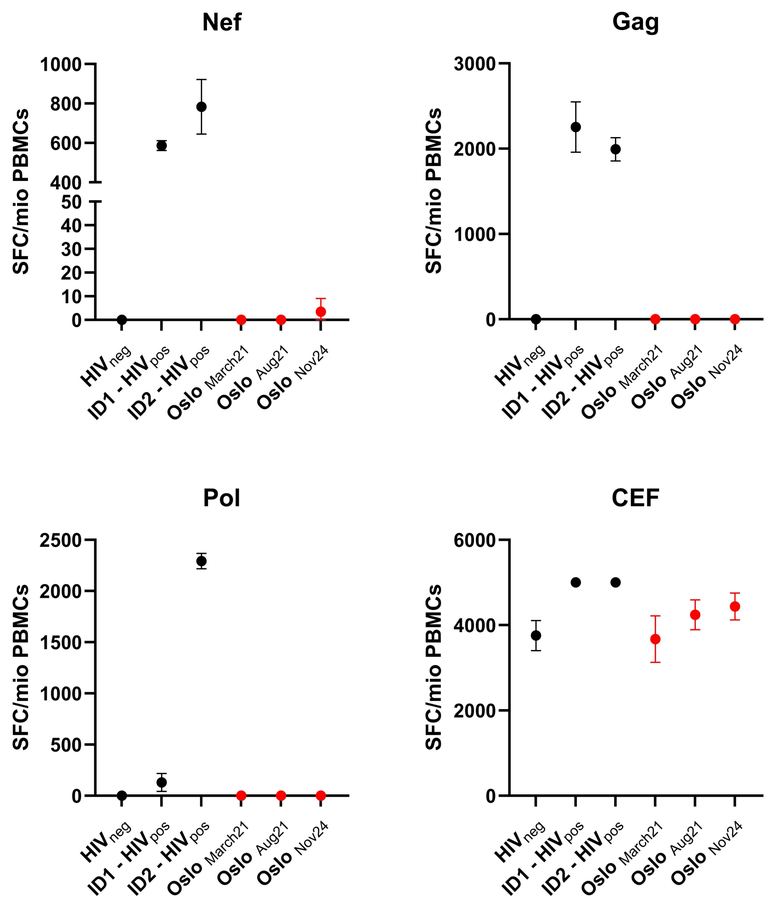

Fig. 3. HIV specific T cell responses to Negative factor (Nef), Group specific protein (Gag), Pol protein (Pol), T cell responses to Cytomegalovirus, Epstein-Barr Virus and Influenza (CEF). Oslo patient in red.

Timepoint	GP160	GP120	GP41	P55	P17	P24	P39	P66	P51	P31
	Env			Gag				Pol		
Pre SCT										
3 mo post SCT										
9 mo post SCT										
27 mo post SCT										
36 mo post SCT										
48 mo post SCT										

Fig. 4. Western blot to Env, Gag and Pol from pre-transplant to 48 months post-transplant.

Fig. 5. Serum avidity. Oslo patient in red, historical cure cases in black.

CONCLUSIONS

We report a novel case of HIV remission after HSCT from a sibling donor, confirmed by extensive translational work-up. The donor's CCR5Δ32/Δ32 variant likely prevented reseeding of HIV to the allograft and prolonged GvHD possibly facilitated complete donor chimerism of GALT. Like the Geneva patient, he was treated with JAK inhibitor, which may reduce viral reservoirs.

CONTACT INFORMATION

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DISCLOSURE

This work was presented at CROI 2025.

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