Depletion of Alloreactive T cells for Tolerance Induction in a Recipient of Kidney and Hematopoietic Stem Cell Transplantations

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Abstract

The present case report represents a successful attempt to induce transplantation tolerance to organ allograft by combined administration of donor hematopoietic cells and kidney based on \textit{in vivo} deletion of alloreactive host-vs-graft and graft-vs-host alloreactive T cells following nonmyeloablative conditioning. We were able to induce mixed and eventually full donor chimerism and tolerance of kidney allograft in a 15-year-old male with ESRD after cisplatin treatment and autologous HSCT for mediastinal germ cell tumor. Our approach to induce tolerance was based on preferential depletion of alloreactive T cells induced by exposure to donor’s alloantigens and administration of cyclophosphamide at day 2 & day 3 after stem cells infusion. Additional non-specific immunosuppression as part of the conditioning included exposure to 2 fractions of TLI, treatment with alemtuzumab (monoclonal anti-CD52) and short-term conventional IS treatment to avoid early graft loss, due to request of IRB. Using this approach, with rapid tapering of all conventional IS treatment the patient maintains good renal functions without evidence of both acute and chronic rejection for 25 months off all medications.