LETTER TO THE EDITORS

Czech-Austrian kidney paired donation: first European cross-border living donor kidney exchange

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Dear Editors,

Kidney paired donation (KPD) is an efficient strategy to circumvent major immunological barriers in patients who have a willing and medically able, but incompatible living donor. In recent years, several countries have developed successful KPD programs, including highly active multicenter alliances in the United States, and even international cross-border kidney shipment has been documented [1–3]. In Europe, several countries are running independent KPD programs, with the Dutch program being the most prominent [4]. Smaller programs, such as in the Czech Republic and in Austria; however, are limited by small KPD pools (≤10 pairs per match run). Over the last 5 years, 49 successful KPD transplants have been performed in Prague (3-monthly match runs including both ABO and HLA antibody-incompatible pairs), and, in the last 3 years, a smaller number in Vienna ($n = 8$), where ABO-incompatible pairs are not primarily included. Unfortunately, match rates have now substantially decreased due to growing proportions of broadly sensitized candidates.

For small countries, one clue towards more efficient matching may be the implementation of cross-border kidney exchanges. Indeed, recent data have suggested that prolonged cold ischaemia time (CIT) due to organ transport between distant centres, within the current range of reported shipping times, appears to have no effect on transplant outcomes [5,6]. Recently, we have initiated a binational program, based on a harmonized strategy of virtual cross-matching following the principles of the Australian algorithm [7]. Now, in September 2016, a binational match run (12 pairs; use of a computer software established in Prague) has resulted in our first cross-border two-way kidney exchange (Fig. 1). Both recipients had preformed donor-specific antibodies (DSA), were cross-match positive and had high calculated panel reactivity, triggered by prior pregnancies. Donor exchange resulted in full HLA/ABO antibody compatibility and a better HLA-DR match for the Czech recipient; however, with the disadvantage of a high age mismatch. For the Austrian recipient, there remained some residual risk due to ABO incompatibility and a single low-level DSA (flow cross-match negative). The low strength of the detected antibody, which was considered a minor immunological risk [8], an expected long waiting time for a matched deceased donor organ, and the projected lifetime of our 75-year-old recipient strengthened our decision to accept the risk. Donor nephrectomies were performed simultaneously, after 1 week desensitization of the Austrian recipient (semiselective and ABO antigen-specific immunoadsorption). Both recipients recieved antithymocyte globulin induction and tacrolimus-based immunosuppression. The Austrian recipient received in addition three immunoadsorptions post-transplantation to prevent antibody rebound. Close post-transplant monitoring will include serial HLA antibody screening and a surveillance biopsy after 1 year to timely uncover antibody-mediated rejection. Organs were shipped across the border via ambulance transport, keeping cold ischaemia times at 5:13 (Prague) and 5:35 hours (Vienna), respectively. The clinical course was

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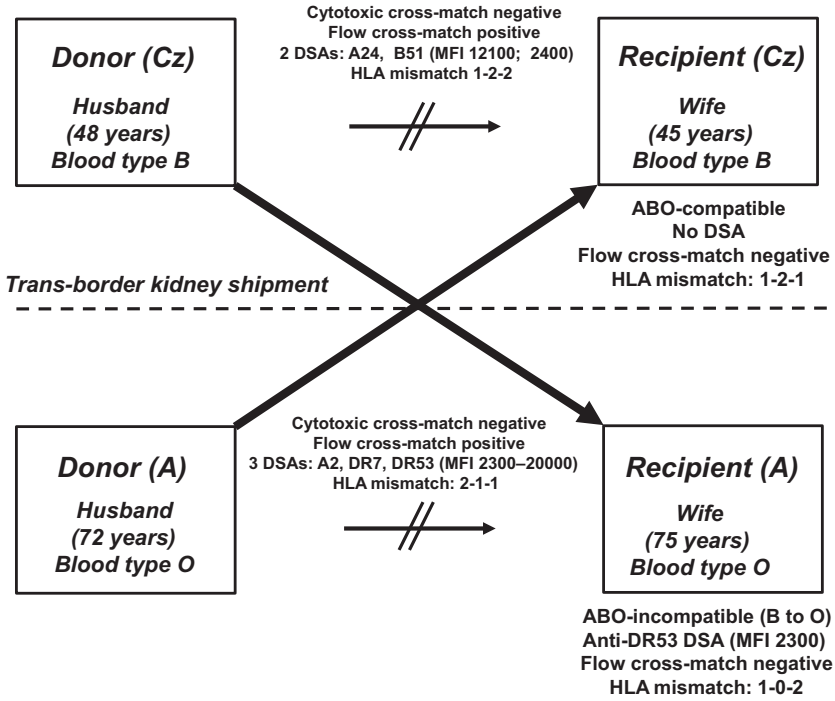

Figure 1 Cross-border living donor kidney exchange.

uneventful in both recipients, with immediate graft function and no signs of rejection (serum creatinine at 3 months: 84 μmol/l in the Austrian and 106 μmol/l in the Czech recipient). Initially, the Czech recipient showed slower recovery of graft function and biopsy revealed mainly the transfer of vascular changes (ci1, ct1, IF/TA1, cv2-3, ah2), which may have led to some vulnerability to ischaemia/reperfusion injury. However, within 2 weeks kidney function normalized. Being aware of a potential contribution of other (e.g. donor-related) risk factors, it will be our effort to limit CIT to a maximum of 8 h for our future exchanges.

Our binational KPD program, which now includes both ABO and HLA antibody-incompatible pairs, and the reported two-way chain, to our best knowledge the first European cross-border living donor kidney exchange, may provide a basis for future efforts merging small national programs within Europe, where international joint initiatives will be critical to maximize living donor kidney exchange.

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Conflicts of interest

None to declare.

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