New model for simultaneous heart and kidney transplantation in mice.

Abstract:
In clinical settings, combined heart and kidney transplantation results in a lower incidence of cardiac graft and renal graft rejection as compared to isolated heart and kidney transplantation. To study the phenomenon in an experimental setting, we developed a model of combined heart and kidney transplantation in mice. According to our technique, we kept the patch of the infrarenal aorta and inferior vena cava (IVC) as long as possible during the donor's kidney explantation, and then, after finishing the kidney implantation with conventional techniques, we anastomosed the innominate artery and pulmonary artery of the heart graft to the patch of the infrarenal aorta and IVC of the renal graft, respectively, instead of the recipient's aorta and IVC. With the use of our method, combined heart and kidney transplantation in mice can be performed to get enough suture room for the second graft, to avoid prolonging the occlusion time of the recipient's circulation, and to profoundly decrease postoperative complications such as paraplegia and mortality. Of the 14 recipients with combined heart-kidney isografting, 10 have been successful (71.4%), surviving over 100 days with normal function of both grafts, and with lack of change in histological appearance. This suggests that the technique is feasible and reliable.