ELSEVIER

En Bloc and Dual Kidney Transplantation: Two Initial Cases from a New Kidney Transplantation Center

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ABSTRACT

Aim. The aim of this study was to share our initial successful experiences with en bloc dual kidney transplantation.

Cases. En bloc kidney were obtained, for case 1 from a 3-year-old deceased pediatric donor who had undergone cadaveric liver transplantation due to fulminant hepatitis A virus infection 1 week prior. The donor length was 97 cm and weight 13 kg. According to the age and weight of the donor, we selected a 50-year-old respectively. For case 2, a kidney was retrieved from a 20-month-old pediatric donor after development of hypoxic brain injury secondary to status epilepticus. The donor lengh and weight were 75 cm and 13 kg respectively. A 30-year-old female patient was of 162 cm and 59 kg. The suprarenal aorta, suprarenal vena cava, and caval and aortic lumbar branches were closed with running sutures during the backtable procedures. After the classic Gibson incision, the donor aorta was anastomosed to the recipient right common iliac artery, and the donor inferior vena cava to the recipient right common iliac vein in end-to-side fashion. The ureters were implanted with mucosa-to-mucosa ureteroneocystostomies separately according to the Lich-Gregoir technique. After the vascular anastomoses the kidneys had immediate good perfusion in both cases. Postoperative recovery was rapid, the recipients were discharged uneventfullly.

Conclusion. En bloc dual kidney transplantation from young pediatric patients to adult recipients can be performed with low mortality and morbidity even by new centers.

KIDNEY transplantation (KT) is the treatment choice for patients with end-stage renal disease (ESRD). It is associated with an improved quality of life and improved survival among these patients. Unfortunately, there is a major shortage of available donors worldwide. In our country, the major organ source for KT is living donors. Because living donors are not availabe for all patients, most clinicans select marginal donors to expand the pool. Transplantating en bloc dual kidneys from pediatric patients to adult recipients can increase the pool. We began KT in November 2010 performing 18 living and 6 cadaveric (two of them en bloc dual KT) donor transplantation in the first 6 months. The aim of this presentation was to share our initial successful experiences with two en bloc dual KT (EBDKT) from young deceased pediatric donors to adults at a hospital in the eastern part of Turkey.

CASE 1

En bloc kidneys were obtained from a 3-year-old deceased pediatric donor who had undergone cadaveric liver transplantation due to fulminant hepatitis A virus infection 1 week prior. After the development of brain death we retrieved en bloc kidneys. The donor right and left kidney sizes were $5 \times 3 \times 3$ cm and $4 \times 3 \times 3$ cm, respectively. The donor length was 97 cm and weight 13 kg. There was no renal dysfunction; urine output was 25/mL/h over the last 8 hours. We selected a 50-year-old man of body weight 51 kg and length 150 cm displaying two identical human leukocyte antigens (HLA-A24, DRB1-11). The recipient and donor had compatible blood groups. Total ischemic time was 10 hours and 15 minutes.

CASE 2

After developing hypoxic brain injury secondary to status epilepticus, en bloc kidneys were retrieved from a 20-month-old pediatric donor. The donor length and weight were 75 cm and 13 kg respectively. The donor's kidney

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function was normal; the urine output over the pair 8 hours was 30 mL/h The size of both retrieved kidneys was 5 × 3 × 3 cm. A 30-years-old female patient of 162 cm and 59 kg had three HLA mismatches (HLA-B44, DRB1-03, DRB1-15) and compatible blood group with donor. Total ischemic time was 18 hours and 2 minutes.

OPERATIVE TECHNIQUES AND IMMUNSUPPESSION

Both kidneys were retrieved en bloc with the donor's aorta and vena cava. Suprarenal aorta, suprarenal vena cava, and caval and aortic lumbar branches were closed with running sutures on the back table (Fig 1). We started with a classic Gibson incision preparing the right iliac fossa for extraperitoneal implantation. The donor aorta was anastomosed to the recipient right common iliac artery and the donor inferior vena cava to the recipient right common iliac vein in end-to-side fashion using 6/0 prolene running sutures. Using a 6/0 polydioxanone surgical suture the ureters were implanted using mucosa-to-mucosa ureteroneocystostomies separetely according to the Lich-Gregoir technique using a double J stent and each ureter. After the vascular anastomoses, kidneys showed immediate good perfusion; urine output started in 20 minutes in both cases (Fig 2). A drain was placed in the surgical site in both cases. Total operative time was 5 hours for case 1 and 3 hours for case 2.

We administered methylprednisolone before surgery and (anti-thymocytes globulin) for induction immunosuppression. Prophylactic antibiotic and low molecular heparin were given to both patients. Tacrolimus, mycophenolate mofetil, or enteric-coated mycophenolate sodium (EC-MPS) plus corticosteroid were prescribed postoperatively. The transplanted kidneys were not imaged routinely in the postoperative period. Foley catheters of recipients were removed on postoperative days 8 and 6, respectively.

Postoperative recovery was rapid and uneventful: the recipients were dischaged on postoperative days 10 and 7 respectively. They were regularly followed of in the nephrology outpatient clinic. Case 1 died on postoperative days 11 due to sudden cardiac arrest after discharge. There was no urologic or vascular complication; the patient's graft was functional. Case 2 is at postoperative day 60, free of any event in the follow-up period.

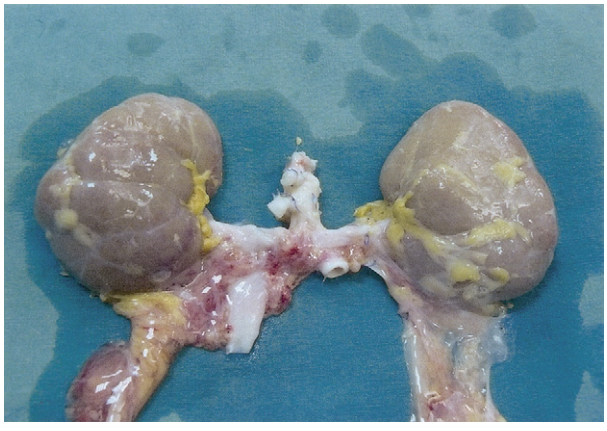

Fig 1. Closed suprarenal aorta, suprarenal vena cava and caval, and aortic lumbar branches.

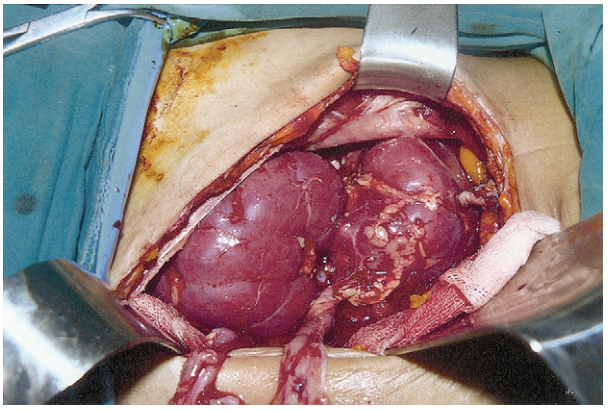

Fig 2. Immediate good perfusion after the vascular anastomosis.

DISCUSSION

Many centers are unwilling to perform EBDKT because of the high risk of complications such as vascular thrombosis, lymphocele, and urologic problems. Some works have observed delayed graft function and rejection to be more common in EBDKT.[1,2] Pediatric donations especially from children younger than 2 years of age carry a greater risk.[3]

Snanoudj et al observed an increased 16% (13/81) risk of surgical complications in EBDKT.[4] arterial thrombosis (n = 6), venous thrombosis (n = 5), and hemorrhage (n = 2). Hematoma and vessel thrombosis are the most common complications in EBDKT.[5] Most vessel thromboses arrise from a hematoma or lymphocele that is compressing the renal vein, which leads to thrombosis and gaft loos. We didnot observed any arterial or venous thrombosis or stenosis or urologic morbidity in the early period. Extraperitoneal unilateral placement through a Gibson incision can lead to vascular thrombosis (especially renal vein thrombosis) due to compression by the two kidneys.[4,6–8] But we believe that the infrarenal vena cava and aorta provide wide vascular anastamoses for arterial perfusion and venous drainage. This technique was previously described by Amante et al approximately 10 years ago.[7] To avoid vascular thrombosis, we strongly recommend prophylactic anticoagulation in these patients.

Ekser et al showed no increasing delayed graft function among EBDKTs compared with single kidney transplantations.[8] Several studies have suggested that EBDKTs from young donors provide excellent function in adults.[9,10] Similarly, in both of case our urine output began immediately with decreased creatinine levels in the first day.

Lymphocele is an important posttransplant morbidity with an incidence of clinically significant disorders of appointmatch 20%; it may develop among 3% to 40% of kidney recipients after the standard procedure.[11] There was

no lymphocele in our cases. We may have experienced no case due to the use of metalic clips and ligation with avoidance of wider dissection during both the backtable and implantation procedures. Urological complications after EBDKT are significant. Blanchet et al reported that complication could be reduced significantly using the stented Lich-Gregoir technique and a short well-vascularized ureter procured with surroundary fat.[12] Also, ureteral spatulation by more than 10 mm tends to prevent stenosis of the ureteroneocystostomy.[13] Using this technique there was no stenosis or urinary leakage among four anastomoses. Other parameters such as hospital stay, operative time and cold ischemia time were similar to our single-kidney transplant group. A blood transfusion was not required in either patient.

In conclusion, increasing member of ESRD on the waiting list demand a longer donor pool. EBDKT can be a way to increase is pool. Although our follow-up duration is short, EBDKT from pediatric patients to adult recipients seems to be feasible and increased mortality and morbidity, even for a new center.

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