



## A Kidney Transplant Center's Initial Experiences in Eastern Turkey

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### ABSTRACT

**Objectives.** Kidney transplantation is the best treatment method associated with improved quality of life and better survival for patients with end-stage renal disease. We started performing kidney transplantations in November 2010. We have performed 19 kidney transplantations so far. Fourteen of these were from living donors and five from deceased donors. Here, we present our initial experiences with 14 kidney transplant recipients from living donor kidney transplantations.

**Materials and methods.** All recipients and their donors underwent detailed clinical history and examination. Recipients and their donors were followed in the transplant clinic during hospitalization.

**Results.** The male-to-female ratio was 11:3 in recipients. The mean age of recipients was 27.8 years (range 4–58 years). The number of the related, emotionally related, and unrelated transplantations were 9, 3, 2, respectively. The mean warm ischemic time was 95.7 seconds (range 52–168 seconds). Urine output started immediately after vascular anastomosis in all. The mean time of discharge from hospital was postoperative day 8 (range 4–18 days). The mean flow up was 125 days (range 18–210 days). Graft survival was 100% in this period, but one patient died from sepsis after 56 days. No kidney was lost from rejection, technical causes, infection, or recurrent disease.

**Conclusion.** If transplant centers are as equipped and experienced as ours, kidney transplant programs should be started immediately so that they can reduce the number of the patients in waiting list for kidney transplantation.

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**K**IDNEY TRANSPLANTATION (KT) is the gold standard treatment choice for patients with end-stage renal disease (ESRD). KT is associated with improved quality of life and better survival in patients with ESRD.<sup>1–9</sup> We started performing kidney transplantations in November 2010. The major organ source of KT is living donors in our country. We performed 14 KT from living donors since November 2010 at a hospital in eastern Turkey. The aim of this study is to share our initial experiences.

### MATERIALS AND METHODS

We performed 14 KT from living donors between November 2010 and June 2011. All recipients and their donors underwent detailed clinical history and examination. All donors were evaluated according to the criteria of Amsterdam Forum.<sup>10</sup> Human leukocyte antigen (HLA) typing and tissue crossmatch between donors and their recipients were carried just before transplantations. All patients and their donors were of compatible blood groups.

We used routine methylprednisolone (MP) just before surgery as induction immunosuppression. We used prophylactic antibiotic and low-molecular-weight heparin in all patients. Recipient bladders were lavage with 300 mL gentamycin plus serum physiologic and retained about 200 mL of this solution in their bladders by clamped Foley catheter.

There are only two transplant surgeons in our kidney transplant team. Because of this, we started with the donor nephrectomy procedure. After completing dissection, we moved to preparing the implantation area, which was extraperitoneal area in right or left iliac fossa in recipient. After completing this procedure, we returned to donor nephrectomy. After donor nephrectomy, we immediately started implantation procedures in recipient. Eleven

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kidneys were placed in right iliac fossa; the other three kidneys were placed in left iliac fossa in recipients. Except for two children recipients, all renal vessels were anastomosed to external or common iliac vessels in an end-to-side fashion, using a continuous 6–0 polypropylene suture. In two children recipients, we anastomosed one face of renal artery with continuous suture and the other face of renal artery with one-by-one suture technique. Ureteroneocystostomy (UNC) was performed extravesically, using Lich-Gregoir technique over a double J (DJ) stent in all cases.<sup>11</sup> The urethra was prepared by removing redundant urethral length, preserving adequate distal blood supply, and spatulating posterior at least 10 mm. We used 6–0 polydioxanone surgical suture for anastomosis. The detrusor muscle was closed exteriorly to create an antireflux mechanism by one-by-one 3–0 absorbable sutures. A drain was placed in the transplant fossa in the first 10 cases.

Recipients and their donors were followed in the transplant clinic during hospitalization. Fluid replacement was given according to urine output at postoperative first night and balance was ensured by about +500 or +1000 (fluid input more than urine + drainage fluid). Oral fluid intake was ensured in the 6 to 8 hours postoperatively. Intravenous fluid replacement was decreased on the first postoperative day and generally was stopped on the second day.

Complete blood count, coagulation profile, and routine biochemistry tests including renal function tests were performed at the same night of the operation and daily during hospitalization.

Immunosuppressive drug level was controlled and regulated in postoperative day 2 and then daily in this period. Transplanted kidneys were not imaged routinely in the postoperative hospitalization period. Patients were followed by outpatient nephrology clinic after discharged.

## RESULTS

We performed 14 kidney transplantations from living donors. The male-to-female ratio was 11:3. The mean age of recipients was 27.8 years (range 4–58 years). The donors and recipients were related in nine cases (64.3%), emotionally related in three cases (21.4%), and unrelated in two cases (14.3%). Seven patients and their donors had three

HLA mismatches. Two patients had two HLA mismatches. One patient had four mismatches. Two patients had five mismatches, one had six mismatches, one had zero mismatches (full recipient and donor match; Table 1). Blood groups of recipient and donor and causes of ESRD in patients are shown in Table 1.

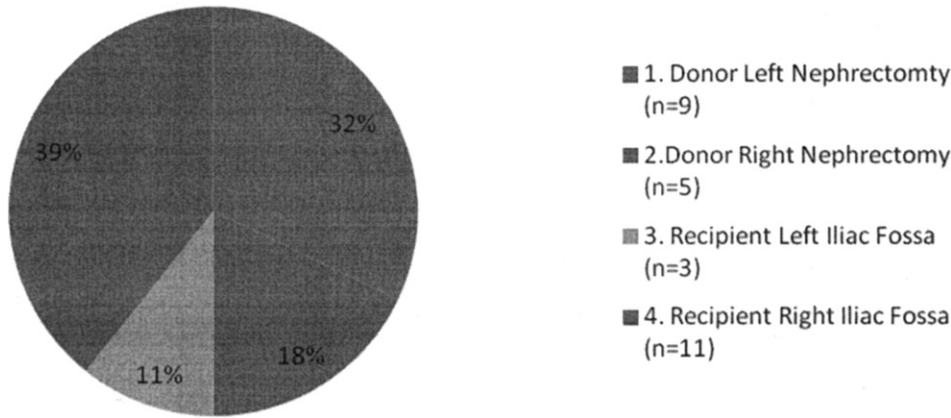
Left kidney donor nephrectomy was preferred when possible. If there were vascular problems or a condition requiring if, we used right kidney nephrectomy. Left donor nephrectomy-to-right donor nephrectomy ratio was 9:5. The right iliac fossa was usually preferred for implantation in recipients. If there was a vascular problem or a surgical necessity such as native nephrectomy or possible pancreas transplantation in future, we used the left iliac fossa. The right iliac fossa was used in 11 recipients and the left iliac fossa was preferred in three recipients (Fig 1). The mean warm ischemic time was 95.7 seconds (range 52–168 seconds). Urine output started immediately after vascular anastomosis. Recipients' Foley catheters were removed on mean postoperative day 5 (range 4–7 days). The mean time of discharge from hospital was postoperative day 8 (range 4–18 days). We used as induction immunosuppressive drugs as antithymocyte globulin or basiliximab. Tacrolimus, mycophenolate mofetil, or enteric-coated mycophenolate sodium and corticosteroid were given to recipients as postoperative immunosuppressive drugs. Trimethoprim sulfmethaxazole and valganciclovir were used for prophylaxis.<sup>12</sup> Acyclovir was used in children instead of valganciclovir. Calcium + vitamin D<sub>3</sub> were given for replacement. We performed a second transplantation in one patient. His first kidney transplantation was about 10 years previously in another a kidney transplant center. We performed allograft nephrectomy at the same operation because there was recurrent urologic infection in this patient at the time of operation. We performed two native nephrectomies because of the concern for recurrent urologic infection. One of these had

**Table 1. Recipient and Donor Demographics**

Patient	Age and Gender	Relation of Donor and Age	Recipient Blood Group	Donor Blood Group	HLA MM	Cause of ESRD	Renal Replacement Options and Duration
1	22, F	Mother, 48	B(+)	B(+)	3	Idiopathic	PD, 9 mo
2	4, M	Grandmother, 50	O(+)	O(+)	2	Idiopathic	Preemptive
3	32, M	Father, 64	B(+)	B(+)	3	Glomerulonephritis	PD, 30 mo
4	17, M	Father, 43	A(+)	A(+)	3	VUR	PD, 9 mo
5	24, M	Mother, 39	A(+)	A(+)	3	Idiopathic	HD, 3 mo
6	11, M	Father, 34	O(+)	O(+)	2	Renal tubular acidosis	Preemptive
7	41, M	Father, 68	A(+)	A(+)	3	Idiopathic	HD, 2 mo
8	14, M	Father, 48	AB(+)	A(+)	3	VUR	PD, 5 y
9	35, F	Unrelated, 50	AB(+)	A(+)	6	Diabetic nephropathy	HD, 7 y
10	25, M	Sibling, 30	AB(+)	AB(+)	0	Nephrotic syndrome	HD, 4 mo
11	34, M	Emotional related, 27	AB(+)	AB(+)	5	Nephrolithiasis	HD, 1 mo (second Tx)
12	44, M	Emotionally related, 41	O(+)	O(+)	5	Hypertensive nephropathy	Preemptive
13	58, M	Unrelated, 34	A(+)	A(+)	4	Idiopathic	HD, 3 y
14	29, F	Emotionally related, 34	O(+)	O(+)	3	Nephrotic syndrome	HD, 8 mo

HLA, human leukocyte antigen; MM, mismatch; ESRD, end-stage renal disease; VUR, vesicoureteral reflux; PD, peritoneal dialysis; HD, hemodialysis; Tx, transplantation.

## Donor Nephrectomy Left or Right/ Implantation Area; Left or Right



**Fig 1.** Side distribution of donor nephrectomy and implantation area.

incurable vesicoureteral reflux, and the other had incurable vesicoureteral stenosis (Table 2).

We planned DJ stent removal 3 weeks later; in seven patients, the mean time was 25.9 days (range 21–29 days). DJ stents have not been removed in four patients yet. We removed the DJ stent on postoperative day 7 in a patient because of a fallen DJ stent in the ureter, compressing the UNC line. This patient suffered from stenosis UNC 2 months after transplantation. A percutaneous nephrostomy catheter was inserted, balloon dilatation was performed, and finally the DJ stent was inserted to treat this complication. This was the single urologic complication in our series (7.1%). Also, the same patient suffered from convulsion

because of hyponatremia and hypomagnesemia. Convulsion was treated by replacement of fluid and electrolytes in 1 day. We could not remove the DJ stent of a patient because she died. In one patient, the DJ stent was removed on postoperative day 72 because of allograft nephrectomy.

A patient suffered from lymphocele (7.1%). We gave sclerotic agent by drainage catheter in the postoperative period. It was successfully treated by intermittent aspiration, using ultrasonography as a guide.

Acute rejection was seen in a patient (7.1%) and he was treated by pulse corticosteroid treatment (500 mg methylprednisolone for 3 days), which was not treat it successfully. There was elevated donor-specific anticore in this patient.

**Table 2. Procedural Details**

Patients	Native Nephrectomy (yes or no) If Yes, What Were the Causes?	Immunosuppressive Induction Medications	WIT (s)	Start of Urine Output Time After Complete Vascular Anastomosis (min)	Time of Foley Catheter Removal (POD)	Discharge From Hospital (POD)	Drain
1	No	ATG + MP	54	2	4	7	Yes
2	No	ATG + MP	90	1	4	7	Yes
3	No	ATG + MP	108	2	5	7	Yes
4	Yes; incurable VUR	ATG + MP	67	1	4	5	Yes
5	No	ATG + MP	52	3	5	14	Yes
6	Yes; incurable vesicoureteral stenosis	Basiliximab + MP	110	7	5	7	Yes
7	No	ATG + MP	80	3	6	10	Yes
8	No	Basiliximab + MP	90	1	4	5	No
9	No	Basiliximab + MP	168*	10	7	18	Yes
10	No	ATG + MP	110	1,5	5	17	Yes
11	No; allograft nephrectomy	ATG + MP	157	5	5	6	Yes
12	No	ATG + MP	108	3	4	5	No
13	No	ATG + MP	65	5	4	4	No
14	No	ATG + MP	81	2,5	4	5	No

WIT, warm ischemic time; POD, postoperative days; ATG, Antithymosin globulin; MP, methylprednisolone; VUR, vesicoureteral reflux.

\*There is an accessory artery.

We successfully treated him with plasmapheresis and intravenous immunoglobulin. There were two cytomegalovirus associated acute rejection episode in two children recipients (14.3%). Both of them were treated by high-dose MP and parenteral ganciclovir.

The mean flow was 125 days (range 18–210 days). Graft survival was 100% in this period, but one patient died of sepsis 56 days after transplantation. This patient's graft was functional when she died. No kidney was lost from rejection, technical causes, infection, or recurrent disease (Fig 2).

## DISCUSSION

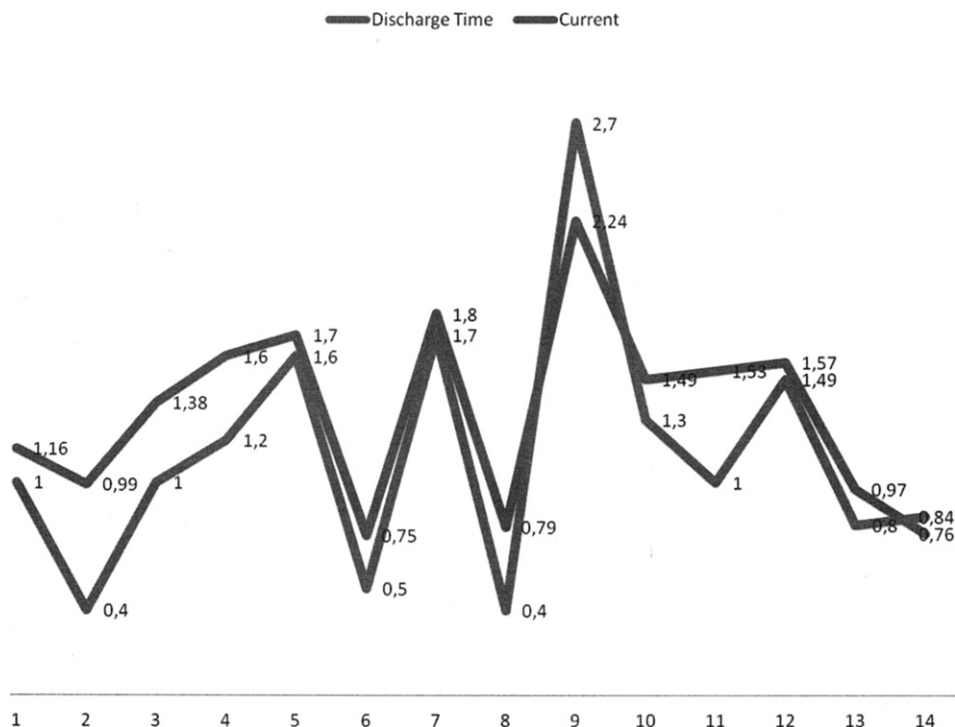
KT improves quality of life and survival for ESRD patients.<sup>1–9</sup> It liberates patients with ESRD from dialysis and his more cost-effective than dialysis. The number of patients with ESRD on the waiting list are increasing day by day.<sup>7</sup> But KT depends on the availability of donors. The most effective way to solve this problem is to increase the number of living donors. In Turkey, living donor transplantations are performed more than from cadaveric transplantations.

In our series, there were more male than female recipients and donors, 11:3 and 8:6, respectively. This is similar to a study done in Iraq,<sup>4</sup> but different from a study done in Nepal.<sup>5</sup> According to the study from Iraq, the reasons for these differences are probably related to the prevailing of sociocultural factors in the region.<sup>4</sup>

Surgical complications remain a significant clinical problem after KT. Urologic complications, vascular complications, and lymphoceles are major surgical problems. The

incidence of urologic complications was reported to be from 2% to 20% in different series.<sup>5,6,9,13–17</sup> The incidence of urologic complications was 7.1% in our series. One of our patients suffered from UNC stenosis 2 months after the transplantation. A percutaneous nephrostomy catheter was inserted and then balloon dilatation was performed and finally a DJ stent was inserted to treat this complication. Blanchet et al reported that urinary complications could be significantly reduced by using a stented Lich-Gregoir technique and a short well-vascularized ureter procured with its fat.<sup>17</sup> Also, ureteral spatulation of more than 10 mm prevents UNC stenosis.<sup>6</sup> Our initial experience showed a correlation to the ideas of these reports. We did not see any arterial or venous thrombosis and arterial stenosis. We recommended that at least one face of the renal artery should be performed with one-by-one suture technique in children or in patients with small arteries. The incidence of clinically significant lymphocele was about 20%, but it may develop in 12% to 40% of kidney transplant recipients.<sup>18</sup> Lymphocele was diagnosed in only one patient (7.1%). There are different treatment methods for lymphocele in the literature.<sup>18</sup> We treated it with sclerotic agent by drainage catheter in the postoperative period and then lymphatic fluid was aspirated three times intermittently by using ultrasonography as a guide. Initially, nonoperative treatment methods should be used for treatment of lymphocele. Also, routine drain usage may be safe option for new centers such as ours.

Hyponatremia and hypomagnesemia were defined in the literature as the reason of convulsion in KT recipients.<sup>19</sup>



**Fig 2.** Creatinine levels of patients currently and at discharge.

There was a convulsion in one patient because of hyponatremia and hypomagnesemia in our series. We gave hypotonic fluid to this patient. Convulsion was treated by replacement of fluid and electrolytes in 1 day. Isotonic fluid replacement should be preferred in KT recipients.

In conclusions, (1) urinary complications could significantly be reduced by using a stented Lich-Gregoir technique and a short well-vascularized ureter procured with its fat. Also, ureteral spatulation more than 10 mm prevents UNC stenosis. (2) We recommended that at least one face of the renal artery should be performed with one-by-one suture technique in children or in patients with small arteries. (3) Routine drain usage may be safe option for new start transplant surgeons such as ours. (4) Isotonic fluid replacement should be preferred in KT recipients.

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