Doi: 10.31276/VJSTE.61(1).41-44

Evaluation of graft function in renal retransplantation at Hue Central Hospital

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Received 28 October 2018; accepted 18 February 2019

Abstract:

This study aims to assess the results of kidney retransplantations and the survival of second kidney allografts performed in our center. Methodology: of 550 kidney transplantations performed since July 2001, 26 were second kidney transplants. Many recipients were sensitized. All patients were treated with the same immunosuppressive regimen. Results: grafts were functionally effective in all patients with kidney retransplantations one month after the transplant. Graft survival was 100% after one year (17/17) and after five years (1/1). Graft survival was similar for second and primary kidney transplants performed during the same period of time. There were three cases of acute rejection, but all of these cases responded to the anti-rejection treatment. Conclusions: the rate of acute rejection was similar for both second and primary transplantations in our hospital, and the second graft outcome demonstrated effectiveness 12 months after transplantation.

Keywords: **graft, renal retransplantation, survival.**

Classification number: **3.2**

Introduction

Since immunosuppressive drugs such as CsA, FK 506, or MMF were introduced, the short-term graft survival rate of kidney transplant increased from 10 to 20%, but the rate of chronic rejection remained high [1]. About 5 to 24% of graft dysfunction occurred within five years post-transplant, and 50 to 80% of rejection patients had to return to dialysis [2]. Graft failure has been one of the most common causes of end-stage renal disease, accounting for 25% of 30% of those on the waiting list [3].

A successful kidney transplant offers enhanced quality and duration of life and is more effective in terms of medical outcome and patient satisfaction relative to long-term dialysis [4]. However, retransplant recipients have a higher risk of immunity reactions relative to those receiving their first grafts [5-7]. The success of retransplantation has improved significantly due to pre-transplant screening and post-transplant treatment [5]. Recent reports have indicated that the success rate of kidney retransplantations relative to first kidney transplants is nearly identical one year after the transplant. Therefore, the evaluation of the outcome as well as an enhanced understanding of the characteristics of this group of patients is necessary for the optimal treatment of chronic renal failure.

Of 550 cases performed at Hue Central Hospital since 2001, 26 cases were retransplanted. We initiated a second kidney transplant from 2012; this number has increasing every year. As we anticipated, the retransplant rate has increased rapidly. There were 10 patients with immunological risk (PRA>25%), including two cases with PRA of greater than 80%. This article seeks to evaluate the outcome of immunosuppressive therapy on retransplant patients and the renal function of patients at one month and one year post-transplantation.

Methods

Of 550 cases between 7/2001 and 4/2018, 26 were

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retransplant cases. The first one was performed in March 2012. Monitoring time was one month, three months, and 12 months post-transplantation. HLA antibodies were detected using micro ELISA or Luminex methods. Patients selected were either ABO-compatible or of the same blood type. Patients with high-HLA antibodies required at least three HLA matches. High-HLA mismatches were recommended for patients who did not have HLA class I antibodies or specific HLA class II antibodies. Crossmatches were performed through complement-dependent lymphocytotoxicity (CDC).

Living donors' details, such as age, gender, and serum creatinin were collected. Recipients' features such as gender, antibodies concentration, HLA mismatches, crossmatches, delay graft function, acute rejection episodes, creatinine intervals at one month, three months, and 12 months post-transplantation, characteristics of the first kidney transplant (graft survival time, interval between two transplants, cause of first graft loss and information on first immunosuppression regimen).

Return to dialysis or death with graft functions was referred to as graft loss. Acute rejections were defined by a combination of clinical criteria and the renal biopsy. Delayed graft functions were defined by requiring at least one dialysis session in the first seven days post-transplantation.

Immunosuppressive regimen

Despite the abundance of immunosuppressive drugs, all patients were treated with quadruple therapy consisting of induction therapy by antithymocyte globulin (ATG) horses or rabbits or monoclonal antibody rather than standard maintenance therapy. The dose of ATG rabbits and horses was 1-1.25 mg/kg/day for seven patients as opposed to 10 patients, respectively. Monoclonal antibody (Basiliximab) was used as the induction regimen for nine patients. Maintenance therapy with cyclosporin (two cases) or FK506 (24 cases) combined with MMF 2 g/day were used along with intravenous corticosteroid, followed by oral administration. The CsA dose was initiated at 7-8 mm/kg/day in two divided doses and adjusted by trough level to 150-200 ng/ml. Tarcrolimus dose was 0.1-0.15 mg/kg/day in two divided doses and adjusted by trough level 8-10 ng/ml. Prednisolone was administered at the rate of 0.4 mg/kg/day followed by 0.3 mg/kg/day and then 5 mg/day after three months. Acute rejections were treated with bolus methylprednisolon 500 mg/day x 3 days. ATG was used for treatment of steroid-resistant rejection. For acute mediated antibody, the plasmapheresis was indicated as ± IVIG [8, 9].

Results

Number of patients each year

Year	2012	2013	2014	2015	2016	2017	3/2018
Cases	1	0	3	3	7	9	3

Characteristics of donors

Gender	N	Average age	Average serum creatinin
Male	25	28.09±8.05	88.59±10.61 µmol/l
Female	1		

100% were living donors.

Characteristics of recipients

Gender	N	Max	Min
Male	15	61	31
Female	6	55	30
Total	21	Average: 42.89±9.59	

ABO blood type

Type (-donor-recipient)	N	Percentages
Same type	15	57.7%
ABO- compatability	11	42.3%
Total	26	100%

HLA matches

HLA match	N	Percentages
2/6	2	7.69 %
3/6	19	73.07 %
4/6	5	19.24%

There were some immunologically high-risk cases that required highly HLA-matched proportions and more extensive immunosuppression regimens.

HLA antibodies

HLA Antibodies	N	Percentages
<25%	16	61.53%
25-80%	8	30.77%
≥80%	2	7.7%
Total	26	100%

Of two cases with PRA≥80% and one with acute mediated antibody required plasmapheresis, one had been desensitized pre-transplant with five plasmapheresis sessions pre-transplant.

Crossmatch

100% of retransplant cases were negative.

Timing of first graft survival

Timing of first graft survival (year)	N	Percentages
<1	1	3.8%
1-5	1	3.8%
5-10	11	42.4%
>10	13	50.0%

There were seven cases who had their first transplant at Hue Central Hospital and 16 in China or at other centers.

Serohepatitis

All patients in this group had been infected and had viral load below detectable levels before transplantation, with anti-HCV positive and HBsAg positive were nine and patients, respectively. All patients with hepatitis virus were placed on low-dose immunosuppression therapy if they had minimal antibodies levels and high HLA matches.

Virus	N	Percentages (%)
HBsAg +	1	4.8
Anti HCV +	9	34.62

Average blood creatinin at 1 month, 3 months, 12 months, 3 years, 5 years

The number of kidney retransplants which experienced normal functioning at one month, three months, twelve months, three years, and five years post-transplant were 26, 25, 17, 4, and 1, respectively.

Timing	1 month	3 months	1 year	3 years	5 years
Creatinin	89.19±36,16	87.96±13,9	94.83±20,16	88.75±10,5	85
Median	85	88.5	90	85.5	
Number	26	25	17	4	1

Acute rejection

There were three cases of acute rejection, which required three to five dialysis sessions; one case with acute mediated antibody needed plasmapheresis. Two cases were treated with bolus solumedrol and ATG. All three cases responded positively to treatment, and kidney function returned to normal before discharge.

Dicussion

We initiated the second kidney transplant starting in March 2012. This number has increased each year because the patients who had previously been transplanted went up and because of immune tests such as the specific HLA antibody Luminex, the experience of the pathology of kidney transplant biopsies, immunosuppressive drugs such as ATG, IVIG... which are fully on the market, the use of plasmapheresis, and knowledge and experience of anti-rejection treatment with high immunologically high-risk recipients [8, 9].

The disadvantage of this article was that the number of patients remained minimal and the follow-up was relatively short. There was merely one five-year patient. Data analysis performed for 50,291 recipients from deceased brain donors was reported by UNOS from 1991 to 1997; Cecka demonstrated that the rate of patient survival five years post-transplant was 82% and that the graft function rate was 63% [1]; the research of Stephani's, et al. perceived the rate of second graft survial as only 2% lower than that among living donors or deceased brain donors. In contrast, in one study, Moss, et al. demonstrated that the short-term outcome of kidney retransplantation relative to first kidney transplantation was the same [4]. In our study, kidney retransplant function was successful in 100% of cases when evaluated at one month, three months, and 12 months. There were three cases that involved delayed renal function, but kidney function then returned to normal. Therefore, recipients from living donors, as well as new immunosuppressive agents, have been proven to produce effective results in short-term renal function. Particularly, graft survival rates interval at one year were not different between first transplants and retransplantations in this group.

Acute rejection is a formidable complication in kidney retransplant patients due to the immunological risk involved [2]. Among these 26 retransplant cases, in three cases, acute rejection accounted for 11.54%, equivalent to approximately 10% of transplants in 550 patients at Hue Central Hospital.

The improvement of graft survival reflects the effect of immunosuppressive drugs and the effective control of cross-reactions between donors and recipients [3]. Additionally, it would be fruitful to minimise cold ischemia time in renal transplantations from living donors and precisely evaluate

immunologically high-risk recipients for better prevention and treatment.

Conclusions

The acute rejection rates and graft function of kidney retransplantations in comparison with first kidney transplantations was not statistically significantly different from the interval at one year post-transplant at Hue Central Hospital.

The authors declare that there is no conflict of interest regarding the publication of this article.

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