Experience of 3 Cases of Living Renal Transplantation in Juntendo University Urayasu Hospital

AKIRA TSUJIMURA^{*1)}, HIROFUMI SHIMOYAMA^{*1)}, TAIJI NOZAKI^{*1)}, YUSUKE AOKI^{*1)},
SOHEI TAKAHATA^{*1)}, SHIGETO YANADA^{*1)}, TAIKI MIZUNO^{*1)}, MASATO SHIRAI^{*1)},
KEIJI NAGAO^{*1)}, SHIGEO HORIE^{*2)}

^{*1)} Department of Urology, Juntendo University Urayasu Hospital, Chiba, Japan, ^{*2)} Department of Urology, Juntendo University Graduate School of Medicine, Tokyo, Japan

We experienced 3 cases of living renal transplantation in our department since its initiation in April 2015. All three patients made favorable recoveries. Generally, the introduction of renal transplantation requires a specified period of preparation time, not only to meet institutional criteria but also to cooperate with other departments or other related units (e.g., clinical laboratory or pharmacy) and to educate other healthcare professionals. We received support from a variety of departments and units in the hospital, and we were able to prepare for the introduction of living renal transplantation in the short time of only 4 months.

Key words: renal transplantation, Juntendo University

Introduction

Treatment of patients with chronic renal failure includes the three approaches of hemodialysis, peritoneal dialysis, and renal transplantation, among which renal transplantation is the approach that impairs quality of life the least. Renal transplantation is a common treatment in foreign countries, and about 65,000 procedures are performed annually. However, although the performance level of renal transplantation in Japan is better than the global standard, the number of cases of renal transplantation performed has not increased very much. The cause is thought to be far fewer kidney donors in Japan. According to 2013 statistics in Japan, 133 institutions performed transplantations, among which 1,586 procedures were performed annually. However, only 41 institutions had experience in treating more than 12 patients (1

patient/month) annually. Furthermore, there were only two facilities for renal transplantation in Chiba Prefecture, in which our hospital is located, and one facility alone performed more than 12 renal transplantations annually.

We began to perform living renal transplantation in April 2015. Here, we report our experience of 3 cases at the early stage and summarize the course of introducing renal transplantation in our hospital.

Case 1: A 59-year-old man

Because of chronic renal failure caused by autosomal dominant polycystic kidney disease (ADPKD), hemodialysis was begun in June 2011. The patient had a history of surgery for left inguinal hernia when he was in elementary school. A kidney was obtained from his brother as a living donor, and the patient underwent living renal transplantation in April 2015. Because of blood group

Corresponding author: Akira TsujimuraDepartment of Urology, Juntendo University Urayasu Hospital
2-1-1 Tomioka, Urayasu-shi, Chiba 279-0021, Japan

TEL: +81-47-353-3511 FAX: +81-47-353-6511 E-mail: atsujimu@juntendo.ac.jp

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incompatibility (recipient: type AB, donor: type A), he received immunosuppressants of basiliximab 200 mg 2 weeks before the transplantation and three drugs, consisting of tacrolimus, mycophenolate mofetil, and methylprednisolone, beginning 1 week before the transplantation. Intraoperatively, basiliximab was also used to suppress acute rejection. The warm ischemia time was 3 minutes 14 seconds, and the time to first-catch urine excretion was 6 minutes 25 seconds. Because this patient's postoperative course was satisfactory, he was discharged on postoperative day 22, but his serum creatinine level at hospital discharge was 1.36 mg/dL. A protocol biopsy was performed 1 month after the surgery, and no signs of rejection were observed. Three months have passed, and he remains on a satisfactory postoperative course with a creatinine level of 1.39 mg/dL.

Case 2: A 59-year-old man

Hemodialysis was begun in June 2010 because of chronic renal failure caused by ADPKD. The patient had a history of hypertension, which had been treated with oral medication. A kidney was obtained from his wife as a living donor, and he underwent living renal transplantation in May 2015. Because of blood group incompatibility (recipient: type O, donor: type B), he received preoperative immunosuppressants of basiliximab 200 mg 2 weeks before the transplantation and tacrolimus, mycophenolate mofetil, and methylprednisolone plus two sessions of double filtration plasmapheresis and one session of plasma exchange beginning 1 week before the transplantation. Despite high preoperative levels (256-fold higher than normal) of both IgM and IgG antibody titers, it was confirmed that the IgM antibody titer had decreased to 16-fold and the IgG antibody titer to 32-fold higher than normal on the day before surgery, and thus renal transplantation was performed. The warm ischemia time was 5 minutes 15 seconds, and the time to first-catch urine excretion was 11 minutes 35 seconds. Additionally, immunosuppressive therapy during and after the transplantation was administered as in case 1. Postoperative antibody titers of IgM and IgG were 4-fold and 8-fold higher than normal, respectively, and no signs of rejection were observed. Thus, he was discharged on postoperative day 22 with his serum

creatinine level at 1.5 mg/dL. A protocol biopsy was performed 4 weeks after the surgery, and no histologically evident signs of rejection were observed. Two months have passed, and his serum creatinine level remains at around 1.5 mg/dL.

Case 3: A 67-year-old man

Hemodialysis was begun in April 2009 because of chronic renal failure caused by nephrosclerosis. He had a history of bilateral inguinal hernia repair and developed emphysema postoperatively as well as hypertension, which had been treated with oral medication. A kidney was obtained from his wife as a living donor, and he underwent living renal transplantation in June 2015. He received immunosuppressants of basiliximab 200 mg 2 weeks before the transplantation and tacrolimus, mycophenolate mofetil, and methylprednisolone beginning 1 week before the transplantation. Immunosuppressive therapy was likewise administered during and after the surgery. His post-transplantation blood pressure remained in the high range between 190 and 199 mmHg, which led to difficult management with antihypertensives. Eventually, however, the combination of two calcium antagonists, with least risk for stenosis and spasm of the renal artery among anti-hypertensive drugs, lowered his systolic pressure to a range between 130 and 139 mmHg. Because of blood group compatibility, he generally had a satisfactory postoperative course. He was discharged on postoperative day 22 with his serum creatinine level at 1.05 mg/dL.

Discussion

We have recently experienced 3 cases of living renal transplantation, and fortunately, all three patients have had a favorable postoperative course. Launching renal transplantation in a hospital necessitates more specialized preoperative preparation and management, and because many treatment-related departments are involved, the launch requires close collaboration with them all at the same time. More specifically, overall consultation is important with such departments as nephrology, which is proficient in hemodialysis; anesthesiology, which is required to perform emergency surgery; pulmonology, with which we can consult about complications; and cardiology, gastroenterology, endocrinology, neurology, and psychiatry.

Additionally, complete simulation must be performed in cooperation with the infectious disease control department; the pathology laboratory, which can determine the presence of acute rejection; the clinical laboratory, which can perform specialized tests at any time; and the pharmacy department, which provides specific drugs such as immunosuppressants. Also, among the efforts that should be made before initiating such surgery, education must be provided to healthcare professionals, such as intensive care unit nurses and medical engineers, and staff in the outpatient department, the hospital wards, and the operating room.

We conferred with the staff of the nephrology department on the recipient conditions for hemodialysis and individually met with the staff of anesthesiology, the operating room, and the intensive care unit. In addition, we held two hospital-wide conferences (Figure-1). Taking into consider-

Figure-1 More than 100 attendances in the hospital-wide conferences

ation the history of renal transplantation and the present situation of the transplantations already performed in Japan, we all understood the flow of pre- and postoperative management of the surgery that would be performed in our hospital. In other words, we had numerous discussions on the items and observation points that must be considered for the patients from their admission, and on pre- and postoperative control of fluid replacement, measurement of blood concentrations of immunosuppressants, and precautions necessary when blood is collected from these patients.

Perioperative management of donors was also simultaneously confirmed. We also asked the staff to make advance emergency purchases of the required immunosuppressants and to make measurement of drug levels in the blood available in the hospital. If necessary, we obtained approval from the Hospital Ethics Committee for the necessary test items and drugs that would be used.

We asked the operating room staff to visit and inspect the operating rooms of other facilities in which many living renal transplantation procedures have been performed. In addition, before the day of the first actual surgery and in collaboration with the anesthesiologist, we simulated the kidney transplantation procedure from the donor to the recipient and reconfirmed the procedure. Therefore, we were able to take appropriate measures on the day of the actual surgery (Figure-2A and B).

Ours is a middle-sized hospital with 656 beds and has been established in Urayasu city as a flagship hospital in the community. Thanks to the support and help of the director and the staff of each hospital department, we achieved smooth cooperation with

Figure-2 Operation room at the first case

all relevant departments. This led to the safe introduction of living renal transplantation in a short time. Fortunately, in all three patients, neither serious perioperative complications nor appreciable postoperative complications were observed. We thank each member of the other related departments or units and the other healthcare professionals, and we hope to continue to perform living renal transplantation in the future.

Conclusion

Within a short time, we were able to introduce and perform living renal transplantation in three patients at Juntendo University Urayasu Hospital and obtained good results. We reported the process of introducing living renal transplantation in our hospital.