

Kidney Transplantation after *ex vivo* Repair of an Aneurysm of the Donor Renal Artery

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신동맥류가 있는 공여신을 이용한 생체신장이식

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Kidney transplantation, particularly from a living donor, is the treatment of choice for most patients with end-stage renal disease. The superior results achieved with kidney transplantation from living donor. We report a case of transplantation using a kidney with renal arterial aneurysm from a 49-year-old living donor to her 51-year-old brother. A preoperative CT angiogram in a donor candidate showed the right kidney with 6 mm sized saccular aneurysm involves the proximal portion of anterior segmental artery. The kidney was removed by a hand-assisted laparoscopic nephrectomy. After *ex vivo* aneurysmectomy, the graft was transplanted into the right iliac fossa. The total ischemic time was 62 minutes, and the urine flow was started immediately after declamping. If there are multiple donor candidates of same condition, donor with unilateral renal artery aneurysm should be chosen for transplant. The use of those grafts is safe for both recipients and donors.

Key Words: Renal artery aneurysm, Kidney transplantation, *ex vivo* repair

중심 단어: 신동맥류, 신장이식, 생체외 복구

INTRODUCTION

Since the first successful kidney transplantation (KT) in 1954, KT has become established treatment as the curative therapy for end-stage renal disease (ESRD). In Korea, the number of patient with ESRD is increasing continuously, with almost 38,000 patients under dialysis. However, fewer than 1,000 KT are performed each year. This main limitation for KT is the shortage of donor organs. Overcome of this limitation has forced to use of marginal graft with arterial aneurysm deemed unsuitable in early times.(1-3) Although the

donor kidney has renal artery aneurysm (RAA), we have to use this kidney after *ex vivo* reconstruction. Our case suggests that donor with unilateral RAA can be used for transplant and the use of those grafts is safe for both recipients and donors.

Case Report

A 51-year-old male with end-stage renal disease and his 49-year-old sister as an identical donor were admitted to our center for KT. During the donor evaluation, CT angiography demonstrated a 6 mm sized saccular aneurysm involves the proximal portion of right anterior segmental artery. Contralateral kidney and other preoperative examinations were normal. Tc-99m DTPA renal scan showed that the computed glomerular filtration rate of left kidney was 56.4 mL/min, right kidney was 53 mL/min. The left kidney contributed 52% of total renal function, right kidney did 48%. Right kid-

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Fig. 1. A resected kidney with 6 mm sized saccular aneurysm.

ney was retrieved via a hand-assisted laparoscopic nephrectomy. Warm ischemic time was 120 seconds. After nephrectomy, the donor kidney was placed in the ice slash and perfused with ice-cooled Collins solution. Single renal artery and vein were identified. The aneurysm was located at anterior segmental artery (Fig. 1.). The aneurysm was resected and repaired with transverse lateral angioplasty using 6~0 polypropylene under loupe magnification. The donated kidney was transplanted in the right iliac fossa, with the renal vein anastomosed to the common iliac vein and the renal artery to the external iliac artery. Total ischemic time was 62 minutes and the urine flow started immediately after declamping. The patient was discharged on postoperative day 14. At 6 months after transplantation, Magnetic resonance angiography demonstrated normal renal vascularization with no aneurysmal change.

DISCUSSION

For most patients with ESRD, KT has the greatest potential for restoring a healthy, productive life. There are growing discrepancy between available organ donation and increasing need for kidney grafts because of the rising incidence of ESRD.(4) The annual number of KT is 900 whereas the annual number of new renal replacement therapy patients is about 9,000 in Korea. The critical shortage of organs available for KT has led to use graft with RAA for increasing the donor pool and successful KT after ex vivo repair of RAA has

been reported.(1-3,5) Kidney with RAA might have been deemed unsuitable in early times. The experience of transplant surgeon and development of microvascular techniques has permitted use of these kidneys. The incidence of RAA in the general population is about 0.1% and with angiographic study, the incidence is about 1%.(6,7) Although selection criteria of these kidneys for transplantation are not well defined, living donor with unilateral lesion (and a normal contralateral remaining kidney) except intraparenchymal RAA or irreparable renal ischemia can be suitable for transplant.

In author's opinion, if there are multiple living donor candidates include donor with RAA, we have to choose a donor who has unilateral RAA and normal contralateral kidney. There are three reasons for choosing these kidneys. The first, natural history of RAA is unclear and unpredictable. It has a risk of embolism and rupture, but there are no reliable parameters to predict whether or not a patient with RAA will be ruptured. Also, such lesion may progress and become symptomatic in the donor at a future time, and necessitate surgical intervention. The second, advance with surgical technique, technical successful rate of RAA is reported more than 95%.(8) This repaired kidney can be transplanted safely to recipient without additional risk. Lastly, in donor's aspect, there is no additional perioperative mortality and morbidity compared with healthy donors.

Conclusion, kidney from living donor with unilateral RAA can be safely reconstructed and transplanted with good early outcome for both the recipient and the donor.

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