

# Successful Reuse of a Transplanted Kidney 9 Years after Transplantation

Ronen Ghinea MD<sup>1,2</sup>, Nir Horesh MD<sup>1,2</sup>, and Eytan Mor MD<sup>1,2</sup>

<sup>1</sup>Department of Surgery and Transplantation B, Sheba Medical Center, Tel Hashomer, Israel

<sup>2</sup>Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

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The imbalance between the number of kidney transplant candidates and the number of ideal kidneys donated for transplantation has led surgeons to seek alternative ways for kidney donations. Use of kidneys from extended criteria donors (ECD) is becoming more common worldwide. However, reuse of transplanted organ is a rare event. There are only 10 case reports on reuse of kidneys since Al-Hasani et al. reported the first successful kidney re-transplantation in 1987 [1-3] with an interval of up to 9 years from the first transplantation to the re-transplantation of the same kidney. Other organs have also been reused after transplant, including heart and liver [4]. Since these cases are rare and sporadic, there is no consensus on which organs are eligible for re-transplantation and whether the time passed since these organs were first transplanted is considered in the outcome of reusing the transplanted organ.

Transplanted kidneys undergo chronic allograft nephropathy characterized by typical histological changes of glomerular sclerosis and tubular atrophy leading to graft failure at a median time of 10–15 years. The majority of reused transplanted kidneys reported in the literature were reused shortly after the original transplant. Therefore, the use of a transplanted kidney years after it was originally

transplant has to be carefully considered. In this report, we present a case of a successful kidney re-transplanted 9 years after it was first transplanted.

## PATIENT DESCRIPTION

We present the case of a 46-year-old woman with chronic renal failure due to polycystic kidney disease who underwent kidney transplantation in 2007. The transplantation took place outside the borders of Israel; hence, we had no information of the first donor. The patient had her follow-up in our post-transplant clinic and was maintained on a triple immunosuppressive protocol of Prograf (Astellas Pharma US, Inc.), CellCept® (Genentech USA, Inc.), and prednisone. Throughout her 9-year follow-up creatinine levels were normal without any acute rejection. In addition to her renal insufficiency, her polycystic disease also caused several known brain aneurysms that were treated with angioembolizations prior to her transplant. In May 2016, 9 years following her kidney transplant, she had a spontaneous intracranial hemorrhage from which she did not recover and was declared brain-dead. During this period, her creatinine levels were normal at 0.8 mg/dl.

The kidney was allocated according to the family request to her brother, a 51-year-old man who had the same polycystic kidney disease. The patient was on the kidney transplant waiting list and on dialysis for 7 years. Cross-matching between the siblings was negative, but a virtual cross-matching with the first

donor was impossible to perform, as the first donor was unknown and his HLA typing was unavailable.

Organ procurement of the renal graft was conducted by insertion of a femoral cannula through the left femoral artery with perfusion of the grafted kidney on the right side while clamping the infra-renal aorta. The graft was removed with a patch of the iliac vein and artery and the ureter was taken with a patch of the bladder. Since the donor renal functions remained normal all through her hospitalization, we decided to proceed to transplant without taking a biopsy. The kidney was then transplanted to the right flank with no intra-operative complications. Vascular anastomoses were performed in an end to side fashion to the external iliac vein and artery and the ureter was connected to the bladder after cutting the bladder patch with a slight shortening of the ureter to avoid the scar tissue. Overall, cold ischemia time was 5 hours.

Post-operative hospitalization was impeccable, the patient started to pass urine immediately and creatinine levels dropped from 14 mg/dl to 1.15 mg/dl 6 days following the kidney transplant. The patient was treated with immunosuppressive agents including Prograf, mycophenolate mofetil, and prednisone. The patient was discharged on postoperative day 7. Two weeks after the transplantation the patient was admitted with a high potassium level of 6 meq/l combined with non-anion gap metabolic acidosis that was diagnosed as type 4 renal tubular acidosis (RTA). He responded well to treat-

ment with kayexalate and bicarbonate. At last follow-up 46 months after transplant creatinine level were 1.2 mg/dl (calculated CCT 62 ml/min/1.73 m<sup>2</sup>).

## COMMENT

There are approximately 850 patients listed for kidney transplantation in Israel to date. This number has remained stable over the last few years. In 2018, approximately 320 kidneys were transplanted from living and deceased donors. The average waiting time from listing to transplant is 5–7 years for organ, varied by blood type. In an effort to increase the number of possible grafts there is a growing acceptance of marginal organs that were not widely considered adequate in the past, including high kidney donor profile index donors, donor after cardiac death (DCD) donors, and donors with multiple arteries or with certain neoplastic tumors.

We report here a case of using a transplanted kidney 9 years after the initial transplantation. The transplant maintained good graft function in the second recipient almost 4 years after re-transplantation. Although a similar case has been recently reported [3] our case strengthens the assumption that a stable graft can be reused if needed, even a long time after the first transplant

In our case, we faced several challenges, mainly with issues related to tissue matching, since there was no medical record from the first donor. A formal cytotoxic crossmatch was made between the first recipient who became the donor and her brother, the second recipient, which was negative. We could not test

the matching between the first donor and the second recipient. However, the second patient was not pre-sensitized and had a negative panel-reactive antibody (PRA), placing him at a very low risk to harbor antibodies against any donor of a matched blood type. Therefore, after we informed the patient of the calculated risk, we progressed with the transplant.

Harvesting a previously transplanted kidney can be technically challenging. Access to the transplanted kidney and achieving a proper length of the blood vessels and the ureter may be difficult and damaging. In previous reports, thick adhesions caused decapsulation of the harvested kidney [1]. In a case described by Goralczyk et al. [5] the ureter was too short to reach the bladder and the pelvis of the graft was directly anastomosed with the ureter of the recipient. In our case the consent was given specifically to harvest only the kidney. We used the opposite side common iliac artery for cannulation and ligated the iliac artery distal to the cannula and the infra-renal aorta proximally. We managed to harvest the kidney intact with its capsule and with sufficient length of both blood vessels and ureter, which was removed with a patch of the bladder. There were no technical issues in the transplantation.

Another issue was the long interval between the first and the second transplant that might have shortened the life span of the graft. Although we decided not to perform a biopsy prior to the re-transplant, we assumed that the biopsy might have shown some chronic allograft nephropathy changes, which would not change the decision to transplant the or-

gan, since the patient would remain on the waiting list with the associated risk of death. Furthermore, the favorable clinical parameters of normal creatinine levels, without any proteinuria, and in light of the first recipient, who became a donor was without any significant co-morbidities, made this kidney favorable for a successful outcome.

## CONCLUSIONS

Re-use of transplanted kidneys is feasible in certain conditions, despite higher risks of adverse events following the re-transplantation of a kidney. Long periods between the original transplant and the reimplantation of a transplanted kidney should not exclude organs for donation.

## Correspondence

Dr. N. Horesh

Dept. of Surgery and Transplantation B, Sheba Medical Center, Tel Hashomer 52621, Israel

Fax: (972-3) 530-2316

email: nir\_horesh@hotmail.com

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**If you set your goals ridiculously high and it's a failure  
you will fail above everyone else's success.**

James Cameron (born 1954), Canadian film director, producer, screenwriter, editor, and environmentalist

**When you reach the end of your rope, tie a knot in it and hang on.**

Franklin D. Roosevelt (1882–1945), American politician who served as the 32nd president of the United States from 1933 until his death in 1945