

## Editorial

# Kidneys with Small Renal Tumors: An Acceptable Source for Transplantation

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**ABBREVIATIONS**

KT: Kidney Transplant; ESRD: End-Stage Renal Disease; ECD: Expanded Criteria Donors; RCC: Renal Cell Carcinoma; PN: Partial Nephrectomy; mTOR: Mammalian Target of Rapamycin

**EDITORIAL**

Kidney Transplant (KT) is the best treatment for patients with end-stage renal disease (ESRD). Unfortunately, it is not available to every patient with ESRD, and this is mainly due to the increasing number of patients in the waiting list and the shortage of kidneys suitable for transplantation. This fact is a major problem, even in countries with the highest rate of deceased donors in the world, like Spain. Thus, only 58 kidneys Per Million of Population (pmp) are generated, while approximately 100 pmp are needed [1]. Recently, several strategies have been carried out to increase the number of kidneys for transplant, such as Expanded Criteria Donors (ECD), living donors and non-heart-beating donors. Although the pool was increased, it is still insufficient and many patients never have an opportunity to be transplanted, remaining on dialysis and therefore having an important mortality risk, especially in elderly, which is approximately 6.3% per year for patients in the waiting list [2].

Renal Cell Carcinoma (RCC) supposes 3% of all malignancies and its incidence is highest in over 60 years. Most of them are incidental findings and their treatment of choice, when localized, should be Partial Nephrectomy (PN). The increasing age of donors in this era can lead to a higher number of RCC diagnosed, and could reduce theoretically the number of kidneys suitable for transplant. Several studies, with good levels of evidence, suggest that the gold standard treatment for localized RCC should be PN, because it confers the same survival as radical nephrectomy, with a lower risk of severe chronic disease [3]. Local recurrence is estimated around 0% to 4% and the risk of distant metastases is even lower. Moreover, cancer specific survival is around 95% at 5 years. Thus, due to this low risk of recurrence, some Guidelines such as European Association of Urology consider an option to transplant kidneys with small RCC [4].

Only a few groups in literature have reported their experience using these kidneys for transplant, after the tumor excision. First

group from Australia presents the largest series in literature [5], with 43 kidneys used for transplantation from patients with renal tumors (38 living donors and 5 deceased). This study has an interesting point of view, due to the approach to kidneys and patients. Patients with renal tumor diagnose had the option of choosing treatment to perform; those who preferred a radical nephrectomy were asked if the kidney could be used for transplantation. After conventional living donor nephrectomy, perfusion and cold storage were performed in conventional fashion, followed by partial nephrectomy and renorrhaphy. Tumor size was less than 3 cm in all cases, and 31 of them were malignant (25 clear cell, 5 papillary and 1 chromophobe). After a mean follow-up of 32 months, only one patient developed a local recurrence, 9 years after the transplant. No treatment was performed due to refusal of the patient and 18 months later the tumor remained stable.

Another group from USA reported 5 living-donor transplants using kidneys with small renal tumors [6], with a size range of 1.0-2.3 cm. Three of them were malignant (RCC Fuhrman Grade 2-3), while the other two were angiomyolipoma. After a median follow-up of 15 months (range 1-41), cancer specific survival was 100% and there was no evidence of local recurrence. Moreover, a Japanese group [7] reported their experience using 42 restored kidneys from living patients, which had benign pathology, aneurysms, ureteral cancers, ureteral strictures... Of the total, 8 had small renal tumors; all of them were pT1a and Fuhrman grade 1 or 2. After 135 months, no tumor recurrence occurred.

Most recent article, from a Spanish group, reports 11 transplants with kidneys from 8 donors with tumor. Musquera et al [8] harvested a total of 4 kidneys with small tumors from living donors and 8 from deceased donors with tumor in one kidney (1 of them was not available for analysis because of organ distribution policy). Of the total 11 kidneys, 8 had tumor and the other 3 were the contralaterals. In all cases partial nephrectomy was performed during the bench surgery, assessing histological negative margins before the transplant. Mean age of donors was 47.8 (range 22-72), while mean age of recipients was 53.3 (range 38-73). Tumor size was 14.8 mm (range 3-43 mm), and all cases were pT1a, except one pT1b. Fuhrman grade was low in all cases and all margins were negative. Only one patient developed a surgical complication,

which was acute bleeding from the site of tumorectomy, requiring reintervention. One year graft survival was 100% and, with a mean follow-up of 32.34 months (range 1-57), no one had cancer recurrence and mean creatinine was 1.28 mg/dl.

After the transplant, an immunosuppression based on mTOR inhibitors (sirolimus, everolimus) would be the most logical option, due to their proved antitumor effect. Follow-up schedule should include donors and recipients, monitoring the graft, native kidneys and other regions such as thorax. Conventional partial nephrectomy schedule purposed by Musquera et al seems to be reasonable, with abdominal CT and chest X-ray. In case of a relapse, and depending on the site, several treatments could be performed, including partial nephrectomy of the graft, ablative therapies, radical nephrectomy of the native or mTOR inhibitors.

All these data seem to support the idea of using 'marginal' kidneys, including those with tumors, as an optional source for transplant, especially in selected cases such as elderly patients in the waiting list, in whom annual mortality is significantly high. As a new strategy, it could be an addition to the "old for old", increasing the number of elderly patients who can reach a kidney transplant and avoid dialysis. Recipients should receive appropriate information and special informed consents about the tumor transmission risk, as well as a higher rate of complications due to the partial nephrectomy (bleeding, urinary leak, wound problems...). Strict follow-up is mandatory in order to diagnose potential recurrences in early stages, considering several treatments such as surgery, ablative therapies or mTOR inhibitors if they occur.

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