



Native Nephrectomy in Patients With Autosomal Dominant Polycystic Kidney Disease Evaluated for Kidney Transplantation

Alessandro Anselmo, Giuseppe Iaria, Marco Pellicciaro*, Daniele Sforza, Alessandro Parente, Andrea Campisi, Chiara Cacciatore, Eleonora Calafiore, Gennaro Pisani, and Giuseppe Tisone

Department of Hepatobiliary Surgery and Transplant Unit, Tor Vergata University of Rome, Italy

ABSTRACT

Native nephrectomy (NN) in patients with autosomal dominant polycystic kidney disease (ADPKD) is indicated in cases of recurrent urinary tract infections and hematuria, neoplastic degeneration, and encumbrance. Timing, indication, and surgical approach of NN depends on the symptoms or policy of the center. The aim of our study is to evaluate our experience.

In our retrospective study, we included 130 patients with a diagnosis of ADPKD from 530 patients evaluated for renal transplantation from 2011 to 2017. We analyzed the etiologic indication, the timing, and the complications of NN.

In our cohort, 53 patients underwent open NN, 85% pre-kidney transplantation (KT), 13% post-KT, and only 1 case simultaneous with KT. In the pre-KT group, indications included: major indication was encumbrance in the. In the post-KT group, the major indication was infection followed by encumbrance, which developed after KT. Complications were: 3 cases of bleeding (1 required relaparotomy, 2 evolved into hematoma and radiological derange); 1 iatrogenic iliac artery injury, which was contextually repaired, and 5 cases of incisional hernia. At 35 ± 7.2 months follow-up, patients' survival was 96%; 1 patient died at the induction of anesthesia and 1 patient from sepsis after double NN and removal of nonfunctional transplanted kidney.

NN is not without complications and should be performed when clearly indicated. In our experience, we preferred to perform NN before KT.

AUTOSOMAL dominant polycystic kidney disease is a common cause of end-stage renal disease, representing around 10% of renal transplant recipients and 15% of patients on dialysis [1,2]. Most ADPKD patients, up to 40%, are treated with kidney transplantation (KT) [3]. Quality of life of these patients can be affected either by the end-stage renal disease or by the complications associated with the multisystem nature of the disease. A conservative approach involves treatment of chronic pain, cyst infection, and hypertension that could be associated with the disease [4]. However, surgical procedures are not rarely necessary, especially in patients, candidates, or those undergoing KT. Indication to native nephrectomy (NN) is considered in the case of recurrent hematuria, urinary tract infections, compression syndrome, and refractory pain. In candidates for KT, the most common indication is the need for space to avoid compression of the graft. The ideal timing and technique (laparoscopic versus open) of NN in patients

evaluated for KT can be controversial, as no consensus exists on this surgical problem. The aim of our study was to analyze the prevalence of ADPKD in a cohort of candidates for KT in our institution and the indications, timing, and complications of NN.

METHOD

This is a retrospective study that involved all ADPKD patients evaluated for KT at University of Tor Vergata Kidney Transplant Center from January 2011 to December 2015. Demographic and

*Address correspondence to Marco Pellicciaro, MD, Department of Hepatobiliary Surgery and Transplant Unit, Tor Vergata University of Rome, Policlinico Tor Vergata, Viale Oxford, 81, 00133, Rome, Italy. Tel: 0039 0620901; Fax: 0039 06.2090.0018. E-mail: Marcopell62@gmail.com

clinical data were retrieved in a prospective designed database and included incidence, indication, timing, complication, and outcome of NN in patients in relation to KT. Time of follow-up was defined as June 2018 or death.

STATISTICAL ANALYSIS

Continuous data were reported as median and ranges; rates are expressed in percentage. Data were collected with Microsoft Excel 2013 (Microsoft, Redmond, Washington). We used the Student unpaired *t* test to compare the various groups. Patient and graft survivals were analyzed using the Kaplan-Meier estimation. Probability was measured using the χ^2 test.

RESULTS

Between January 2010 and December 2017, we studied 530 patients who underwent KT; 130 were ADPKD (24%). Fifty-three patients with ADPKD (40%) underwent NN. The vast majority of NN were before KT (46 cases; 85%). Only 1 (2%) patient underwent NN during the KT and 6 (13%) post-KT. In the pre-KT group, the most frequent indication of NN was for space reasons (70%). Other causes were recurrent infections and hematuria (respectively, 17% and 13%). In the post-KT group, the main indication of NN was recurrent infections (58%), followed by increasing volume of the native kidney (28%) and hematuria (14%). No statistically significant difference was found in the indication of NN in the 2 groups, as shown in Table 1.

Demographic characteristics of the 2 groups are reviewed in Table 2.

Median hospitalization was 5 days [3,18]; 2 patients underwent rehospitalization due to fever and abdominal collection. Both patients underwent radiological drainage and were discharged after 3 and 4 postprocedure days.

One case had iatrogenic lesion of the common iliac artery during the NN, which was contextually repaired during surgery. The patient was discharged in 7 postoperative days and had a normal Doppler ultrasound of iliac arteries at the 1-month follow-up.

Only 1 patient needed relaparotomy due to hemorrhage; other complications are reviewed in Table 3.

In 2 cases, at the pathologic examination, a renal cell carcinoma was found without evidence at preoperative radiological examination.

Overall survival was 96.3%. One patient died during the induction of anesthesia. One patient, who underwent simultaneous bilateral NN and explant of a previously transplanted kidney, died due to sepsis and multiorgan failure.

Table 1. Indications to Nephrectomy

	Pre-KT	Post-KT	P
Space	32	2	.083
Hematuria	6	1	1.000
Infection	8	3	.370

Table 2. Patient Demographics and Characteristics

	Pre-KT (n = 46)	Post-KT (n = 6)	P
Male	29 (67.5%)	1 (16%)	.0269
Age (years)	55.5 [40-70]	54.1 [40-71]	.8962
Body mass index (kg/m ²)	25.61 [20-40]	28.33 [21-32]	.5556
Diuresis before nephrectomy (cc)	500 [0-2000]	-	-
Diuresis post-nephrectomy (cc)	100 [0-900]	-	-
Peritoneal dialysis before NN	6 (14%)	-	-
Peritoneal dialysis post-NN	4 (9%)	-	-
Hospitalization (days)	5 [3-15]	7.5 [4-18]	.2836
Intensive care unit stay (days)	1 [0-4]	0 [0-2]	.0386

Values are reported as median, [range], (percentage).
KT, kidney transplantation; NN, native nephrectomy.

At the last follow-up of patients who underwent NN (median was 35 ± 7 months), 21 patients underwent KT after NN and are have good clinical conditions and renal function. Twenty-one patients were on the waiting list for KT; 2 were temporarily excluded due to comorbidity and 3 others. The 6 who underwent post-KT NN at last follow-up were all alive with a functioning graft.

DISCUSSION

Need, indication, timing, and approach for NN in ADPKD has been long controversial. The majority of studies present in literature about NN performed in ADPKD transplant recipients are retrospective and differently designed based on the authors' experience, which makes drawing conclusion rather challenging [5].

Incidence of NN in our study was 40.7% according to the rate reported in literature [6].

The majority of NN in our population were performed pre-KT, and the most frequent indication of NN was for space reasons. Enlarged native kidneys may cause a compression to the transplanted kidney, contributing to technical difficulty or complications during transplant surgery as well as vascular and urine flow complications after KT. Due to the size of the native kidneys, we decided to not perform NN laparoscopically. Other indications in our cohort were recurrent infections and hematuria. Performing NN before KT has the advantages to facilitate KT in case of enlarged native kidneys and reduce bleeding and infectious events after KT. For some authors, this strategy has the disadvantage of prolonging the wait-list time [7].

Table 3. Complications and Treatments Post Native Nephrectomy

	Number of patients	Clavien-Dindo	Treatments
Hemorrhage (fluid collection)	2	III	Radiological drainage
Abdominal fluid collection	3	I	None
Anemization	2	II	Blood transfusions
Anemization	3	I	None
Incisional hernia	5	-	Surgical repair

We performed only 1 case of simultaneous NN and KT in which the indication was encumbrance. Our reluctance to perform both the surgeries at the same time stems from the risk of increased ischemia time and increased postoperative complications if compared to KT alone [8]. Moreover, simultaneous NN and KT could increase the risk of hypotension during the surgery, compromising the reperfusion of the graft. In our opinion, another disadvantage of this strategy is the increased infection risk due to the cystic rupture during the surgery combined with immunosuppression after KT. Performing a KT and NN simultaneously could also increase the operating time, leading to a logistic problem in centers in which the same team also performs the liver transplant.

Routine pre-KT NN is considered obsolete by many in the transplant community [9] and should be performed only when clearly indicated. When NN is needed, unilateral NN should be preferred in the face of preserved endogenous erythropoietin production [10] and sustained urine excretion [11].

CONCLUSION

NN should be performed when clearly indicated and not routinely due to the surgery complications and risk. Laparoscopic approach should be considered in cases of small-size diseased native kidneys. In our opinion, there is a need for establishing a consensus regarding indications and timing.

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