

# Comparison of Native Ureteral Ligation and Open Nephrectomy for Pediatric Renal Transplantation



G. Torino, M. Innocenzi,\* E. Mele, S. Gerocarni Nappo and N. Capozza

From the Division of Pediatric Urology, Bambino Gesù Children's Hospital, IRCCS, and Department of Obstetric-Gynecological Sciences and Urological Sciences, University of Rome Sapienza (MI), Rome, Italy

**Purpose:** In pediatric renal transplant recipients there are some indications for native nephrectomy, which can be performed before, during or after transplantation. Indications include massive proteinuria resistant to therapy, intractable hypertension, polyuria and chronic or recurrent kidney infections. Several scientific studies of adults have demonstrated a minimally invasive alternative to native nephrectomy, which consists of ligation of the native ureter without removing the kidney. We evaluated the safety and efficacy of this minimally invasive technique in pediatric recipients of renal transplantation.

**Materials and Methods:** A total of 29 pediatric kidney transplant recipients underwent unilateral native ureteral ligation during renal transplantation between 2009 and 2013 (group A). In addition, a control group of 21 pediatric renal transplant recipients was enrolled who had undergone unilateral native nephrectomy between January 2005 and December 2008 (group B). Both groups were evaluated preoperatively by Doppler ultrasound of the native kidneys.

**Results:** Statistical analysis of the 2 groups for the 3 main variables considered (surgical time, intraoperative blood loss and length of surgical scar) revealed a significant difference (Mann-Whitney U test,  $p < 0.001$ ). This finding confirmed the hypothesis that during renal transplantation ligation of the native ureter is less invasive than native nephrectomy.

**Conclusions:** Ligation of the native ureter without removal of the ipsilateral kidney is a feasible procedure in pediatric renal transplant recipients. This method is easy to perform and significantly less invasive than surgical nephrectomy.

## Abbreviations and Acronyms

NK = native kidney

NN = native nephrectomy

NUL = native ureteral ligation

Accepted for publication April 23, 2016.

No direct or indirect commercial incentive associated with publishing this article.

The corresponding author certifies that, when applicable, a statement(s) has been included in the manuscript documenting institutional review board, ethics committee or ethical review board study approval; principles of Helsinki Declaration were followed in lieu of formal ethics committee approval; institutional animal care and use committee approval; all human subjects provided written informed consent with guarantees of confidentiality; IRB approved protocol number; animal approved project number.

\* Correspondence: Department of Obstetric-Gynecological Sciences and Urological Sciences, University of Rome Sapienza, Viale del Policlinico 155, 4-00165 Rome, Italy (e-mail: [innocenzi.michele@gmail.com](mailto:innocenzi.michele@gmail.com)).

**Key Words:** kidney transplantation, ligation, minimally invasive surgical procedures, nephrectomy, ureter

In pediatric renal recipients indications for native nephrectomy include massive proteinuria resistant to therapy, intractable hypertension, polyuria, chronic or recurrent kidney infections and need to use the native ureter for reconstruction of the urinary tract of the graft.<sup>1,2</sup> Native nephrectomy can be performed before, during or after transplantation, and can be done using open surgery or

mini-invasive surgical techniques. Minimally invasive techniques have an advantage over open surgery in terms of postoperative pain and hospital stay.<sup>3,4</sup> However, open and minimally invasive surgical techniques can involve significant morbidity and complications.<sup>5</sup> The most important complications related to native nephrectomy are bleeding, infection, intestinal/liver/splenic lesions and

pneumothorax.<sup>1</sup> For bilateral pre-transplant native nephrectomy morbidity and mortality rates of 40% to 50% and 3% to 11%, respectively, have been reported.<sup>6</sup> However, more recently a mortality rate of less than 1% and a complication rate of about 6% have been reported for surgical native nephrectomy.<sup>7,8</sup>

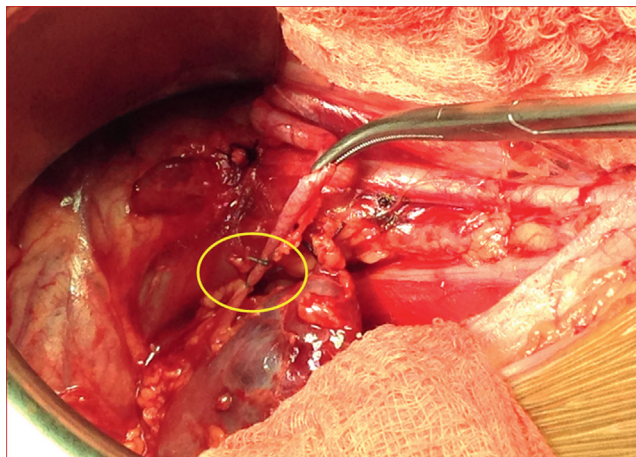
NUL has been applied in adults to use the native ureter to reconstruct the urinary tract of the graft.<sup>9,10</sup> These studies have resulted in a complication rate of approximately 2% with subsequent need to remove the kidney subjected to ligation.<sup>9,11</sup> The main complications reported are linked to infection and late onset of flank pain from 7 to 82 months postoperatively. This pain is thought to be due to the underlying renal disease rather than NUL.<sup>9</sup>

In the literature there are only 2 known clinical studies describing NUL as an alternative to NN to deal with massive proteinuria (17 patients) and vesicoureteral reflux in the native kidneys (12).<sup>12,13</sup> These studies show the absence of complications and postoperative symptoms related to NUL.

Only 2 cases of NUL have been described in pediatric recipients, which were performed during kidney transplantation as an alternative to NN.<sup>13</sup> In both of these patients the indication for NUL was vesicoureteral reflux in the NK. The authors did not report symptoms or complications. The present study is novel because 1) we routinely applied NUL in pediatric renal transplantation and 2) the technique was used not only to reconstruct the urinary tract of the graft (as described in the literature), but also in all cases where there was any indication for NN (excluding conditions of pre-malignant/malignant or polycystic kidneys). We evaluate the safety and efficacy of this minimally invasive technique in pediatric recipients of renal transplantation.

## MATERIALS AND METHODS

We prospectively recruited patients attending Bambino Gesù Children's Hospital from 2009 to 2013. During this period all pediatric candidates for kidney transplantation with an indication for nephrectomy underwent unilateral NUL without excision of the ipsilateral kidney during renal transplantation. Ligation of the ureter was performed with a 2-zero nonabsorbable suture, mainly just below the ureteropelvic junction (fig. 1). Indications for NN were polyuria, massive proteinuria resistant to therapy, intractable hypertension, recurrent urinary tract infections and need to use the native ureter for reconstruction of the urinary tract of the graft. Polyuria, given the absence of an internationally established definition,<sup>2</sup> was defined as urine output greater than 48 ml/kg per day, while proteinuria was considered to be massive at values greater than 3 gm/1.73 m<sup>2</sup> per 24 hours.<sup>14</sup>



**Figure 1.** Ureteral ligation during renal transplant

Recipients with malignant renal lesions, conditions predisposing to malignancy of NK or polycystic kidneys were excluded from the study. Those awaiting kidney transplantation who underwent pre-transplant NN were also excluded.

Between 2009 and 2013 we recruited 29 candidates for kidney transplant who also needed to undergo unilateral NUL during renal transplantation as an alternative to NN (group A). In addition, we enrolled a control group of 21 pediatric recipients who had undergone unilateral NN between January 2005 and December 2008 for the same indications (group B, table 1).

Operative time, intraoperative blood loss and length of surgical scar were evaluated in the 2 patient groups to compare the invasiveness of NUL vs nephrectomy. Antibiotic prophylaxis was used for 1 month in both groups. Perioperative complications were also compared in the 2 groups. Postoperative followup consisted of systematic laboratory tests, Doppler ultrasound and regular assessments of pain, blood pressure, infections and possible complications. Mann-Whitney U test was used to analyze continuous variables and Fisher exact test to analyze dichotomous variables. A p value of less than 0.05 was considered statistically significant in both tests. Median followup was 28 months (range 1 to 49) in group A and 84 months (66 to 102) in group B.

## RESULTS

Although a preponderance of males was observed in the 2 patient groups, with a male-to-female

**Table 1.** Indications for native nephrectomy

	Group A	Group B
No. intractable hypertension	2	4
No. polyuria	17	9
No. intractable proteinuria	6	6
No. urinary tract reconstruction	2	1
No. recurrent pyelonephritis due to vesicoureteral reflux	1	1
No. recurrent pyelonephritis due to obstructive hydronephrosis	1	0
Totals	29	21

Download English Version:

<https://daneshyari.com/en/article/3857903>

Download Persian Version:

<https://daneshyari.com/article/3857903>

[Daneshyari.com](https://daneshyari.com)