

## Single Center Experience in the Management of Urological Complications in Live Related Kidney Transplant: A Retrospective Study

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### ABSTRACT

**Purpose:** We report herein the incidence of and ways of management of urological complications after living related renal transplantation.

**Methods:** Between 1990 and 2012, we performed 104 live related renal transplantation. We retrospectively studied recipient and donor characteristics, cold ischemia time, urological complications, as well as graft and patient 5-year survival rates.

**Results:** Fourteen urological complications were reported among fourteen patients. We noted 35.7% Clavien IIIa, 64.2% Clavien IIIb, and 7.1% Clavien IVa grade. We reported the changes in the ways of management of urological complications from open surgical repair to conservation and minimally invasive techniques.

**Conclusion:** Urologic complications appear frequently after renal transplantation. The surgical techniques involved are highly specialized and must be individualized with each patient.

### Keywords

Kidney transplantation, Stents, Urological Complications.

### Introduction

As Kidney transplantation offers patients with end-stage renal disease the greatest potential for increased longevity and enhanced quality of life. It is important to have data regarding urological complications in live related renal transplant patients and their management. Despite improvements in surgical and diagnostic techniques, surgical complications (SCs) following kidney transplantation remain an important clinical problem that may increase morbidity, hospitalization and cost.

The data on urological complications of renal transplantation in live donor kidney transplant is limited.

The purpose of this study was to document a retrospective analysis of urological complications following living related kidney transplants in order to study the overall incidence of these

complications and their management.

### Patients and Methods

This is a retrospective study of one hundred and four consecutive live related kidney transplants performed at urology department, Alexandria university between June 1990 and December 2012. The medical and surgical records of all recipients were collected and analyzed. Preoperative extensive work up for both the donor and recipient was performed including HLA typing, cross matching and CT angiogram for evaluation of donor kidney vasculature. All of our patients were first time transplant. All grafts were placed in right iliac fossa.

Immunosuppression protocol using the combination of Cyclosporine, Azathioprine and corticosteroids was applied for all patients except one who was induced with simulect due to mildly positive panel reactive antibodies. The graft renal vein was anastomosed end to side with external iliac vein. The renal artery

was anastomosed end to end with native internal iliac artery in 102 patients and two were end to side fashion with native external iliac artery.

Ureterovesical anastomosis was established by modified Lich Gregoire technique of extra vesical ureteroneocystostomy. JJ stent was placed in sixty four patients as we adopted non-stented anastomosis in the first forty patients. Redivac drain and Foley catheter were removed on 5th, 7th post-operative day respectively. On 10th post-operative day, the patients were discharged after measurement of the blood level of immunosuppression drugs. After four weeks, JJ stent was removed under culture based antibiotic coverage.

## Results

Seventy three (70.2%) were male and thirty one (29.8%) were females. with a mean age of 30.8 years. (Range, 11-55 years).

Mean serum creatinine on post-operative day 7 was 1.2 mg/dl (0.9-2.1) which was achieved in sixty six patients (63.4%) while 85 recipients (81.7%) had the same mean serum creatinine on day 30.

Fourteen urological complications were observed in our patients, constituting an overall incidence of 13.4%. There were ten patients with urinary leakage and four cases of obstructive uropathy,

Four out of ten patients presented with urine leakage underwent kidney transplant surgery from 1990 to 2000 while the remaining six patients underwent surgery from 2000 to 2012

The leakage of urine started with in twenty four hours of surgery in the first four patients while in the other six patients the leakage started on the 4th post-operative day. Re-exploration for the first three patients had revealed leakage from ureteroneocystostomy which were initially done without a JJ stent and were managed by reimplantation of the ureter over a JJ stent in. The fourth patient had a short donor ureter was managed during transplantation by Boari flap. On re-exploration leakage at the anastomosis site observed which was repaired.

From 2000 to 2012, the six patients presented with urine leakage started on the 4th post-operative day. All of them had stented uretero vesical anastomosis. PCN was inserted under fluoroscopic guidance in all patients resulted in stoppage of the leakage. Four weeks later patients underwent cystoscopic stent removal and combined (antegrade and retrograde) contrast study which revealed neither extravasation nor stricture. PCN was removed days after. Only one patient developed ureterovesical stricture after six months who was managed by balloon dilatation and JJ stent.

Four patients presented with obstructive uropathy in the form of two patients with ureterovesical stricture two weeks post JJ removal and managed by PCN and antegrade JJ stent insertion, the third one presented with upper ureteric stricture mostly due to impaired vascularity of the donor ureter who was managed by PCN and antegrade LASER endoureterotomy. Unfortunately, his

baseline creatinine level became high (3.6 mg/dl) and accordingly, the decision was taken to exchange JJ stent every year. The last patient presented with large lymphocele (7\*8cm)compressing on the upper ureter causing moderate hydroureteronephrosis with renal impairment(serum cret=2.8 mg/dl),the patient prepared for PCN and laparoscopic marsupulization of lymphocele.after stabilization of the graft function(serum cre=1.1 mg/dl),antegrade nephrogram revealed no ureteric obstruction then PCN was closed for three days to monitor the temperature and leucocytic count and degree of right iliac fossa pain.Three days later PCN was removed and patient is doing well since that.

Clavien Dino	I	II	IIIa	IIIb	IVa	IVb
Urinary fistulae	-	-	4 patients	6 patients	-	-
Obstructive uropathy	-	-	One patient	3 patients	-	-

**Table 1:** Clavien-Dino classification of urological complications.

## Discussion

Urological complications following renal transplantation cause significant morbidity and/or graft loss. The two important factors influencing the success of ureterovesical anastomosis are the vascularity of the donor ureter, which may be compromised during the donor nephrectomy and by handling during transplantation. Vascular compromise produces ischemia that may affect both proximal and distal parts of ureter [1-4]. Two of our patients had impaired graft function, they returned to temporary dialysis and were at risk of graft loss due to impaired vascular supply of the ureter, one had proximal stricture and the other had distal stricture at Boari flap site.

The incidence of ureteric complications in current literature is between 6-14% [5-7]. In our series overall urological complications rate was 13.4% which is comparable to other series. A study carried out by A Sirvastava et al [8], reported 7.7% complication rate with non-stented and 2.0% with stented ureteral anastomosis.

However, the complication rate in our series is slightly higher than A Sirvastava (11.3, 4.2% respectively), it may be due to a smaller number of patients in our series.

It has been our policy to avoid dissection in the triangle between renal hilum, ureter and lower pole of the kidney to avoid damage to ureteral vasculature. As the ureter receives most of the blood from renal vessels, we use the minimum required length of the ureter.

Other factor which might result in decreasing the complications rate in our series was the routine use of stented extravesical ureteroneocystostomy, which has been shown to be associated with a lower incidence of urological complications in other studies as well [9]. Most of the urological complications occurred early after renal transplantation (ten out of fourteen complications occurred within the first post-operative week), this corroborates with similar finding in other studies [9,10].

Role of routine ureteric stenting in the kidney transplant setting is debatable in literature. A prospective randomized study evaluated the effect of ureteric stenting by Kumar concluded that routine placement of stent was cost effective and almost eliminate urological complications [11].

Many studies have shown that routine use of JJ stents in kidney transplantation significantly reduced the number of early urinary leakage and obstructive uropathy [12,13]. Same is our experience with JJ stent.

The possibility of stent related complications like urinary tract infection, encrustation, stone formation, can be avoided by using biocompatible stents for minimal possible duration. In our study, stenting for four weeks avoided complications without compromising benefits [14].

### Conclusion

The technique of stented extravesical ureteronecystostomy has associated with a low rate of urological complications in our series.

The immediate surgical correction of urologic complications is mandatory, and the techniques involved are highly specialized and must be individualized with each patient.

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