

# Urological Complications In Ureteric Stenting Live Related Renal Transplantation

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## ABSTRACT

**Objective:** To determine the frequency and types of post-transplant urological complications in live-related kidney transplantation with reference to the impact of JJ ureteric stent.

**Study Design:** Case series.

**Place and Duration of Study:** Shaikh Zayed Postgraduate Medical Institute and National Institute of Kidney Diseases, Lahore, from June 2006 to July 2010.

**Methodology:** Consecutive renal transplantations, donors being alive were relatives, retrospectively reviewed. All patients underwent extravesical ureteroneocystostomy and all, except one were stented. From the retrieved clinical records, the frequency and types of various minor and major urological complications and their management was studied. All the complications were managed according to standard guidelines.

**Results:** The overall incidence of urological complications among transplant recipients was 11.9%, observed in 12 patients. The complications were urinary leakage in 2 (2%) and clot retention, ureterovesical junction obstruction and wound infection in one (1%) patient each. Urinary tract infection was observed in 7 (6.9%) patients.

**Conclusion:** Urinary tract infection was the most common urologic complication in the studied cases. The technique of stented extravesical *ureteroneocystostomy* had a low rate of urological complications in this series. Other factors which may reduce the urological complications are preserving adventitia, fat and blood supply of ureter by delicate dissection during donor nephrectomy and prevent kinking and twisting of ureter are important factors in reducing the post-transplant urological complications.

**Key words:** Renal transplantation. Urological complication. JJ stenting. Ureteroneocystostomy. Urinary tract infection.

## INTRODUCTION

Ureteric complications following renal transplantation have been reported primarily from centres with predominantly cadaver donor programmes. The data on urological complications of renal transplantation in live donor setting is limited.<sup>1</sup> Mostly ischemic necrosis of distal ureter is reported.<sup>2-4</sup> Renal transplant has gained much wider acceptance as a treatment option for patients with end stage renal disease in the last three decades in many parts of the world as well as in Pakistan. Since local data is sparse regarding this aspect, it is important to have some data from Pakistan regarding urological complication, in live related renal transplant patients and their management. This has become all the more important following promulgation of the law regarding organ transplantation.

The aim of this study was to assess the frequency and type of urological complications following the related renal transplantation and JJ uretric stenting and their management.

## METHODOLOGY

It was a retrospective review of consecutive live related renal transplantations performed at Shaikh Zayed Postgraduate Medical Institute and National Institute of Kidney Diseases, Lahore, between June 2006 and July 2010. The clinical records of all transplant recipients were retrieved and analyzed. Pre-operatively extensive work up for both the donor and recipient was performed including HLA typing, cytotoxicity cross match and CT angiogram for evaluation of donor vessels. Revascularization of the graft was carried out in a standardized manner. The graft renal vein was anastomosed end-to-side with external iliac vein. The renal artery was either anastomosed end-to-end with native internal iliac, or end-to-side fashion with native external iliac artery.

Urinary continuity was established by modified Lich Gregoire technique of extra vesical ureteroneocystostomy. JJ stent was placed in all except the first patient. Foley catheter and skin stitches were removed on 5th and 14th postoperative day respectively. The patients were observed and discharged on 10th postoperative day after smooth recovery. JJ stent was removed 4 weeks after the surgery. After recording the occurrence of urologic complication and its nature data were entered and analyzed with SPSS. Numerical variables were described with mean  $\pm$  standard deviation; nominal variables were described in frequencies and

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percentages and analyzed by chi-square. P-value of < 0.05 was taken as significant.

## RESULTS

All the patients were having living donor renal transplant. Among the 101 recipients eighty three (82.2%) were males and 18 (17.8%) females with a male: female ratio of 4.6:1, and mean age of 32.3 years; ranging from 18 to 60 years.

All the patients were first time transplant recipients. Ninety seven grafts were placed in right iliac fossa (RIF) and four in LIF. Two of the patients had history of right femoral catheterization for coronary angiography and one had multiple explorations on right side. Seventy four recipients were immunosuppressed with combination of Cyclosporine, Azathioprine and Corticosteroids. One was induced with basiliximab (monoclonal antibody) due to mildly positive panel reactive antibodies.

Five types of urological complications were observed in 12 patients out of 101, constituting an overall frequency of 11.1%. Ten patients were males and two were females. There were 2 cases of urinary leak (2%); one case (1%) each of uretrovesical junction obstruction, wound infection and recurrent episodes of haematuria leading to clot retention, and 7 (6.9%) cases of urinary tract infection.

The leakage of urine in both the patients started within 24 hours of surgery. One of the patients on re-exploration had leakage from uretroneocystostomy done without a JJ stent, and was managed by re-implantation of the ureter over a JJ stent. The second patient had an iatrogenic injury; the ureter was transected at the pelvic uretreic junction during donor nephrectomy. Boari flap was prepared in the recipient to overcome the length of ureter. On exploration leakage at the anastomotic site was observed between renal pelvis and the Boari flap, which was repaired. Despite multiple surgical attempts and different procedures, he continued to leak. Eventually on the 10th postoperative day he had an arterial blow out for which graft nephrectomy had to be carried out. One patient had uretrovesical junction obstruction constituting 1% of all, diagnosed 3 months after transplantation on ultrasonography and antegrade study, and was successfully managed by re-implantation of the ureter.

One patient had wound infection. He was diabetic and was managed with daily dressing with aseptic technique. One patient had recurrent episodes of haematuria leading to clot retention, requiring transfusion of 2 units of blood and cystoscopic clot evacuation. Urinary tract infection was observed in 7 patients (6.9%) who were diagnosed on culture and managed according to sensitivity results.

## DISCUSSION

Urological complications following renal transplantation cause significant morbidity and may result in failure of the graft. The two most important factors influencing the success of vesicoureteral anastomosis are the vascularity of the donor ureter, which is potentially at risk during the donor nephrectomy, and handling during transplantation. Vascular compromise produces ischemia and necrosis that affects the distal part of ureter.<sup>2-4</sup> In one of the presently reported cases the ureter was transected at pelviureteric junction during donor nephrectomy. There was no viable ureter left for anastomosis ultimately resulting in graft loss. Fistula and stenosis are the main causes of morbidity in the post-renal transplant patients.<sup>2,5</sup>

Although the overall rate of stent related complications has decreased over the last 30 years, current literature indicates a frequency of ureteric complications between 4-11%.<sup>6-8</sup> In this series, the overall urological complication rate was 11.1% which is comparable to other series. The ureteral complication rate in this series was 3% which matches with other series. Sirvastava *et al.* reported 7.7% complication rate with non-stented and 2.0% with stented ureteral anastomosis.<sup>9</sup> The complication rate in this series is slightly higher than that of Sirvastava. It may be due to a smaller number of patients in this series. Sirvastava described that overzealous dissection at renal hilum and ureter is the cause of ureteral ischemia and subsequently complications. It has been the authors' policy to avoid dissection in the triangle between renal vessels, ureter and lower pole of the kidney to avoid damage to ureteral vasculature present in this area. As the ureter receives most of the blood from renal vessels, the minimum required length of the ureter is used.

Other factor which might have resulted in a low complication rate in this series is the routine use of extravesical ureteroneocystostomy, which has been shown to be associated with a lower incidence of urological complications in other studies as well.<sup>9</sup> Most of the urological complications occurred early after renal transplantation, which is comparable with similar finding in other studies.<sup>7,11</sup>

Role of routine ureteric stenting is debatable in literature. Kumar evaluated the effect of ureteric stenting in prospective randomized study and concluded that routine placement of stent was cost effective and almost eliminated urological complications.<sup>12</sup> Routine use of JJ stents in kidney transplantation significantly reduced the number of early urinary fistulas and ureteral obstructions.<sup>13,14</sup> Same is the present experience with the use of JJ stent.

The use of stents, though beneficial in reducing the incidence of urological complications, is fraught with

possibility of complications like infection, encrustation, stone formation, migration or breakage. These possible complications can be avoided by using stents for minimal possible duration. Stenting for two weeks avoids complications without compromising benefits.<sup>15</sup>

A series from Salsalone *et al.* reported that the infective complications were mostly due to stent being left in for a long period of time.<sup>16</sup> In this study symptomatic urinary tract infection was observed in 7 (6.9%) patients. This is relatively low compared to other series. The rate of urinary tract infection in the transplanted patients with stented ureteroneocystostomy has been reported to be as high as 31%.<sup>17</sup> The stented extra vesical technique avoids a large cystostomy and consequently low incidence gross haematuria and clot retention. In this study, only one patient had clot retention.

Wound infection was observed in only one patient (1%) in this series while Humar *et al.* reported 4.8% wound infection which is higher than this series.<sup>18</sup> This difference may be due to the difference in sterilization techniques. Also using sirolimus is known to be associated with higher wound infection rate.<sup>18,19</sup>

## CONCLUSION

Urinary tract infection was the most common complication observed in this series with an over all urologic complication rate of 11.10% in live related renal transplantation recipients. The technique of stented extravesical ureteroneocystostomy led to a low rate of urological complications in this series. Other factors which may reduce the urological complications are preserving adventitia, fat and blood supply of ureter by delicate dissection during donor nephrectomy and prevent kinking and twisting of ureter are important factors in reducing the post-transplant urological complications.

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