ORIGINAL ARTICLE

PATTERN, MANAGEMENT AND OUTCOME OF UROLOGICAL COMPLICATIONS IN FIRST POST-TRANSPLANT YEAR IN 50 CASES OF RENAL TRANSPLANT

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Background: Chronic renal failure needs substitutive treatment such as haemodialysis and peritoneal dialysis for the patients to survive. Kidney transplantation improves survival of patients with chronic renal failure. This study was conducted to identify the pattern, management and outcome of urological complications in first post-transplant year in 50 cases of renal transplant recipients. **Methods:** This case series study was conducted in the Department of Urology and Transplantation, Mayo Hospital, Lahore, during the period of three years, from Jan 2006 to Dec 2008. All 50 patients were admitted through outdoor department, Dialysis Unit, and directly referred from other hospitals. Donor and recipient were evaluated thoroughly by history, examination, and laboratory investigations. All donors were live related donors. After getting the proper tissue typing and HLA-matching transplant was done and recipients were thoroughly observed for the development of any urological complication in first post-transplant year. **Results:** Total 8 (16%) subjects developed complications. Urinary leakage was noticed in 3 patients. In one patient leakage stopped spontaneously while in remaining two patients surgical procedure was carried out. Two patients developed uro-sepsis due to intractable UTI. Both were successfully treated with broad spectrum anti biotic. Ureteric stenosis was noticed in 2 subjects. Indwelling JJ stent was placed in one case while remaining case was dealt with uretroneocystostomy. One cases developed Vesico-ureteric reflux. He was treated surgically. **Conclusion:** Early diagnosis and treatment of urological complication may prevent the further morbidity and decline in graft function.

Keywords: pattern, complications, management, post-transplant, first year

INTRODUCTION

Chronic renal failure needs substitutive treatment such as haemodialysis and peritoneal dialysis for the patients to survive. Kidney transplantation improves survival of patients with chronic renal failure.[1] Renal transplant is associated with several non-immunological complications. Urological complications may be serious carries high risk of graft loss; they are amenable to successful treatment if diagnosed early and treated properly.[2] More than 95% one year patient survival and more than 80% allograft survival is achieved in most of the centres throughout the world. The outcome of the transplant depends on the compromise between adequate immunosuppressant to prevent rejection and to maintain sufficient resistance on part of the patient to combat infections. Christian Arab around 300 AD successfully replaced the leg of a patient with that from a black man who had died several days earlier. The modern era of transplantation began in 1950. The first successful kidney transplant was live donor transplant performed between identical twins in 1954. The pioneer study of Sir Peter Brian in 1940s and 1950s firmly established that allograft rejection was due to an immune response and not a non-specific inflammatory response. The Dausset first described HLA antigens in 1958.[3]

Chronic renal insufficiency of moderate degree invariably progresses to end stage renal failure. End stage renal failure is an irreversible disease and if a patient is not treated with permanent renal replacement therapy, his/her survival is not possible. Available treatment options are haemodialysis, peritoneal dialysis or renal transplantation.[4] The number of patients requiring maintenance dialysis therapy is rapidly expanding worldwide. It has got enormous financial implications and burden not only on the patient and his family but also on the health care system. In selected patients renal transplantation is considered to be cheaper and therefore economically desirable than dialysis and also improves quality of life.[5] Kidney transplantation has become the treatment of choice for patients with end stage renal disease since it offers an excellent quality of life. Moreover, the economic impact is considerable, particularly beyond the first year. Indeed, the annual cost of a successful renal transplantation is ten fold lower than haemodialysis.[6]

Urological complications can have a significant effect on the outcome of renal transplantation including the loss of the graft. Prompt and appropriate corrective surgery can diminish the effect of urological complications on graft survival.[7] El Atat *et al* have reported vesico-ureteral reflux, urinary leakage, lymphocele, peri-renal haematoma, renal artery stenosis, and thrombosis of the allograft as complications of renal transplants. They concluded

that surgical complications can be minimized if basic principles of careful transplant techniques are used. Prompt identification and treatment of any complication are critical for graft and patient survival.[8]

The urological complications if left untreated, can greatly influence the graft survival therefore urological complications that can be surgically corrected should be aggressively treated by experienced surgeons in order to avoid the graft loss.[9] Higher the number of risk factors more will be the postoperative complications in renal transplantation.[10] Krol R *et al* recommended in his study of 320 renal transplant recipients that Long-term graft survival among patients after successful treatment of urological complications was similar to that of patients without them.[11]

Urinary fistulae and stenosis are the most common complications that may require surgical revision after kidney transplantation. International data confirmed that older recipients and organs from older donors, especially of male gender, and re-transplantations are to be considered risk factors for urological complications.[12] Half of the renal transplants are lost due to chronic transplant failure. The primary cause of chronic transplant failure is chronic allograft nephropathy. Other causes of transplant failure are calcineurin inhibitor toxicity, recurrence of the original renal disease such as glomerulonephritis and diabetes mellitus, stenosis of the renal artery in the transplant, and urological complications.[13]

This study was conducted to identify the pattern, management and outcome of urological complications in first post-transplant year in 50 cases of renal transplant recipients.

PATIENTS AND METHODS

All 50 patients were admitted through outdoor department, Dialysis Unit, and directly referred from other hospitals. Before renal transplant donor and recipient were evaluated thoroughly by history, examination, and laboratory investigations. All donors were live related donors. After getting the proper tissue typing and HLA-matching transplant was done and recipients were thoroughly observed for the development of any urological complication in first post transplant year. Each patient was given the follow-up period of one year. So the case collection period was of two years from Jan 2006 to Dec 2007. While third year of 2008 was given the follow-up to those patients who were collected in the last months of 2007. We divided the post operative the complications, in to immediate, i.e., within a month, and delayed complications, which occurred from the first month up to the completion of a year. The cyclosporine level, serum creatinine, urine out put specially the operative wound was very carefully monitored for the detection of any sort of leakage. In case of leakage, fluid sent for the fluid DR to see the nature of fluid whether urine or lymph. Urinary leakage was dealt by conservative, i.e., prolonged bladder drainage with antibiotics as well as by surgical intervention. In case of persistent temperature blood and urine cultures were sent simultaneously and after getting the positive cultures proper antibiotics were started to treat the infection. After an uneventful recovery patient was discharged on the immunosuppressive and antibiotics. For first month the patients were set on follow-up on weekly basis. While after that follow-up was set on monthly basis. In each follow up the subjects were thoroughly checked by clinically status of urine out put any signs of graft dysfunction were checked. Serum creatinine was done in each follow up for the assessment of graft function. A conventional as well as Doppler ultra sound was done to rule out any hydronephrosis and vascularity of graft respectively. If hydronephrosis was found than Ante-grade urography, in case of ureteric stenosis, while voiding cysto-urethrography in case of vesico-ureteric reflux was done for the proper diagnosis. These both complications were managed surgically.

RESULTS

This was a series of total 50 transplant recipients, 45 males and 5 females, observed for the development of any urological complications in first post-transplant year. Total 8 (16%) patients developed different complications at different timing during the first post-transplant year. Urinary leakage was seen in 3 patients (6%). One was female and two were males. They presented with abdominal distension, fluid discharge from wound and scanty urine in Folly's catheter. The fluid from the wound was sent for the DR andturned out to be urine. After that, conventional ultrasound was done. Perigraft collection was seen in all cases. Leakage in one case was due to extensive mobilisation of ureter during the donor nephrectomy while remaining both patients of urinary leakage were preoperatively taking corticosteroids due to glomerulonephritis. One subject was dealt conservatively because of spontaneous and gradual decline of leakage from the wound. in remaining 2 patients there was continuous leakage and after 15 days both cases were re-operated and leakage was closed by ureteroneocystostomy over JJ stent. Both subjects were discharged on the 10^{th} day of revised surgery on broad spectrum antibiotics for 2 weeks. JJ stents were removed after 2 months. Two (4%) patients developed urinary tract infection. Both were diabetic and females. Due to intractable urinary tract infection both developed systemic signs of uro-sepsis, i.e., hyperpyrexia, gross heamaturea and the tenderness over the graft area. Due to hypotension the insult of acute tubular necrosis (ATN) was received by both grafts.

E. coli was isolated in both culture reports. Both patients were oligouric for 48 hours. The broad spectrum antibiotics were started. The serum creatinine increased in these subjects gradually but Resistive Index (RI) was maintained, i.e., up to 7 on Doppler ultrasound scan. Both subjects received haemodialysis. After these measures patients improved subjectively, i.e., they became afebrile and urine output returned to within normal range. Objectively, patients improved within 2 weeks by normalisation of serum creatinine level and were discharged on antibiotics and immunosuppressive drugs. These 2 complications occurred within 30 days (immediate complications). At the 6th month of transplantation, 2 (4%) patients presented with scanty urine output and with raised serum creatinine. Ultrasound was done which revealed massive hydronephrosis with dilated ureters. Percutaneous nephrostomy (PCN) was performed and ante-grade urography was done which demonstrated stricture of lower ureteric segment. In one case the stenosis was so sever that the contrast could not reach in bladder. In the other case contrast reached in bladder showing tapering of lower ureteric segment. In first case in which there was complete blockage, Uretroneocystostomy over JJ stent was performed. The other case of lower ureteric segment with the maintained distal patency was dealt with the insertion of JJ stent for 4 months. In both patients serum creatinine became normal within a period of 2 weeks after the procedure and graft function returned to the baseline level.

One patient (2%), developed vesico-ureteric reflux (Table-1). The diagnosis was confirmed by ultrasound scanning which revealed hydro-uretronephrosis. Ante-grade urography was performed which could not demonstrate any distal ureteral stricture/obstruction. Later on voiding cysto-urethrogram (VCUG) was performed to confirm the reflux which demonstrated the reflux in the whole length of ureter with its dilatation up to pelvicalyceal system. This patient initially was put on antibiotics and prolonged bladder drainage. Later on radio-isotope renal scan was done to check the graft function. After the improvement of function in this case ureter was re-implanted in the bladder with a new sub mucosal tunnel as an anti-reflux mechanism (Table-2). The patient was discharged after 10 days and was put on regular follow-up.

Table-1: Pattern of postoperative complications of renal transplantation within fist year (n=50)

Complication	Number	Percentage
Urinary Leakage	3	6%
Uro-sepsis	2	4%
Ureteric Stricture	2	4%
Reflux Uro-pathy	1	2%
Total	**8**	**16**

Table-2: Complications, treatment and outcome

Complication	Cases	Treatment adopted	Outcome
Urinary leakage	3	JJ stent in 1 case Uretroneocystostomy in 2 Cases	Leakage stopped in all cases
Uro-sepsis	2	Broad spectrum antibiotics after culture	Both patients afebrile and urine output returned to normal within two weeks
Ureteric stricture	2	JJ Stent in 1 case Ureteric re-implantaion in 1 case	Obstruction relieved and S. Creatinine normalised within 2 weeks
Reflux Uro-pathy	1	Proper antibiotics and ureteric re-implantation	Grfat function declined earlier at the end of first year

DISCUSSION

In our series where all donors were live related, the urological complications were 18%, which closely resembles the international data. In pattern of complication after renal transplantation in a study of 560 consecutive cases conducted by Samhan *et al* in 2005 the rate of urological complications was up to 15%.[2] In our series total 8 (16%) patients developed complications and these complications were seen more in male recipients than female. Burslay *et al,* conducted study on 646 renal transplant receipts. The majority of recipients who developed urological complications were male.[14]

Among all postoperative complications in our study, the complications of uretro-vesical junction remained at the top. In a very large series of 1,065 consecutive transplant recipients the major urological problems seen were urinary leakage and ureteric obstruction.[15] Safa *et al* also reported the rate of post-transplant complication at uretro-vesical junction within the same range, i.e., 5–6% in their study.[16] The treatment modality we adopted for the anastomotic leakage was not different from the world studies. Lapointe *et al*[17] adopted same modalities for treating the uretro-vesical junction, i.e., from conservative and simple the placement of indwelling JJ stent to uretero-neocystostomy.

Post-transplant urinary tract infection can be attributed to many factors such as age, female gender, co-morbidity and urological instrumentation.[18] Both patients of our series, having urinary tract infection were females, above 50 and both were diabetic. Vesico-ureteric reflux (VUR) persisted in one recipient. Due to its high grade this patient developed signs of graft dysfunction at the end of first year. Nie *et al*[19] found the incidence of vesico-ureteric reflux among the post-transplant urological complications remained around 1%, but its impact on graft outcome is reported directly proportional to the grade and severity of reflux.[20]

CONCLUSION

The most common urological complications in our study were related to uretro-vesical junction of transplanted kidney. By meticulous and careful mobilisation of ureter with peri-ureteric fat during donor nephrectomy and proper ureteric implantation with anti-reflux system in recipient, these complications of uretro-vesical junction can be avoided. By careful selection of recipient as well as donor, early diagnosis, prompt and proper treatment of urological complication after renal transplant may prevent further morbidity and decline in graft function.

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