

CASE REPORT

RENAL TRANSPLANT IN A PATIENT WITH AUGMENTATION CYSTOPLASTY

Khalid Farouk, Uzma Bano* Murtaza Gondal*

Department of Urology, *Department of Medicine, Foundation University Medical College/Hospital, Rawalpindi

A 20 years old girl, had undergone surgery for meningocele six weeks after birth, suffered from neurogenic bladder dysfunction. She underwent an augmentation ileocystoplasty and was trained to perform clean intermittent self catheterization (CISC). After two years she developed renal failure secondary to recurrent urinary tract infections and she was started on chronic hemodialysis. On account of repeated line sepsis, a live related donor renal transplant was performed. About three months after renal transplantation she reported in emergency with an episode of graft rejection secondary to severe infection and later on complicated by leakage of urine from the renal pelvis of the allograft into the peritoneal cavity suggestive of a rent. A percutaneous nephrostomy of the allograft was performed which facilitated healing of the rent in the renal pelvis. The nephrostomy was withdrawn and patient started voiding through urethral catheter and gradually returned to CISC.

Keywords: Renal transplant; Augmentation cystoplasty; Renal failure

INTRODUCTION

Doubts linger about the safety and efficacy of renal transplantation in patients with primary urological abnormalities. One of the urological prerequisites for a successful outcome of renal transplantation is an anatomically and functionally intact lower urinary tract. The management of lower urinary tract dysfunction often requires augmentation to decrease intravesical pressure, and thus attain continence and preserve renal function.¹ Bladder augmentation can be carried out prior to renal transplantation in the same sitting or transplantation can be performed months or years later when indicated². Urinary bladder augmentation by using intestinal segment was first carried out in 1890s. Advancements in surgical technique, perioperative care, and antibiotics have greatly improved outcome. Bladder physiology is better understood, largely through advances in urodynamics. The introduction of clean intermittent self catheterization (CISC) by Lapiès in the early 1970s was the single most important event allowing the widespread use of augmentation cystoplasty. The augmented bladder typically empties poorly and many patients practice life long CISC. The outcome of renal transplant in these patients is generally favorable. However, the incidence of complications is higher and one has to remain vigilant.

CASE REPORT

A 14-year-old young girl presented with debilitating lower urinary tract symptoms of frequency, urgency and incontinence. She had undergone surgery for meningocele six weeks after birth and suffered from neurogenic bladder dysfunction. She gave history of repeated catheterization and urosepsis. Her serum creatinine was 1.2µmol/l. She underwent an

augmentation ileocystoplasty and was trained to perform CISC. Her voiding symptoms settled. She continued to practice CISC and maintained her renal function well for two years. Thereafter, she developed recurrent urinary tract infections and her renal function started to decline progressively. A year later, her serum creatinine rose to 580 µmol/l and she was started on chronic hemodialysis. She poorly tolerated dialysis and had repeated complications of line sepsis. At this stage she underwent a live related donor renal transplant. The vascular anastomoses were carried out with the external iliac vessels and the ureter was anastomosed over a double J stent with the native part of the recipient bladder. The graft had a good perfusion on release of clamps and urine output started instantaneously. Her renal function rapidly returned to normal and she was discharged from the hospital with the advice to continue CISC protocol. She remained on regular follow-up and maintained a serum creatinine level at 0.8 µmol/l for two months.

About three months after renal transplantation she reported, in emergency, with two days history of anuria, high grade fever and painful abdominal distension. She was toxic, had generalized edema and diffusely tender and distended abdomen. Her total white cell count was 20,400/cu.mm and serum creatinine was 490 µmol/l. Ultrasound scan of the abdomen showed swollen allograft (Figure 1) and free fluid in the peritoneal cavity (Figure 2) but there was no dilatation of the transplanted ureter and the urinary bladder was empty. Hemodialysis was carried out and an emergency laparotomy was planned. At laparotomy amber coloured fluid from the peritoneal cavity was drained and the peritoneal cavity was washed with normal saline. There was no apparent

evidence of urinary leakage into the peritoneal cavity. Abdomen was closed with a drain in the peritoneal cavity. Her condition rapidly improved and her renal functions returned to normal. However, urine started pouring out from the abdominal drain and there was no output through the urethral catheter. We were faced with the dilemma to trace the site of urinary leakage into the abdomen. A retrograde ureteropyelogram was performed which revealed leakage of the contrast from the renal pelvis of the allograft into the peritoneal cavity suggestive of a rent (Figure 3). The ureteric catheter was left to provide continuous drainage of urine but the rent in the pelvis did not heal. A percutaneous nephrostomy of the allograft was performed (Figure 4). Diversion of urine facilitated healing of the rent in the renal pelvis. Nephrostomy was withdrawn after three weeks. The patient started voiding through urethral catheter and returned to CISC. She is on our regular follow-up and her renal function is well maintained.

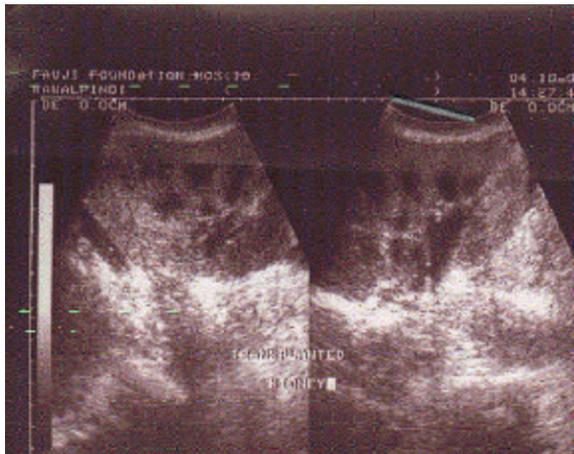


Figure 1. The swollen allograft



Figure 2. Free fluid in peritoneal cavity with an empty bladder

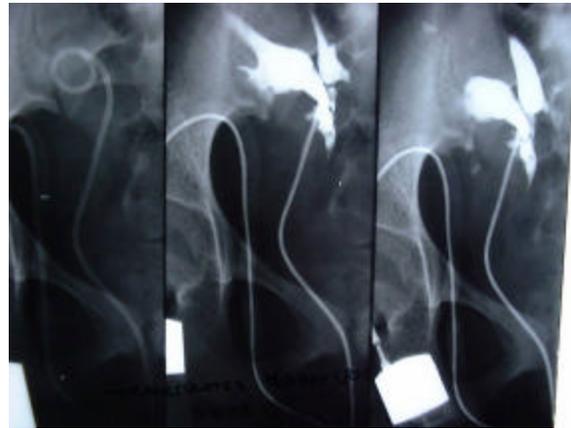


Figure 3. Persistent leakage from the renal pelvis



Figure 4. Percutaneous Nephrostomy

DISCUSSION

Prior to the report by Kelly³, prognosis for renal allograft recipients with ESRF due to lower urinary tract abnormalities was thought to be poor. Many were not considered for renal transplantation as the risk of infection and other complications leading to graft loss was considered to be high. Since then, refinement of the techniques of urological reconstruction, improvements in immunosuppressive therapy, availability of effective antibiotics and the general improvement in the results of renal transplantation have led to an increasing number of these patients receiving renal allograft. Despite a number of publications on this topic some uncertainty still exists regarding the long term prognosis for these patients.

Churchill et al¹ recommend that the urinary tracts of all prospective transplant recipients must fulfill three essential features: (i) an adequate urinary reservoir to permit storage of an adequate volume of urine at a safe low pressure; (ii) a competent urethral control mechanism to ensure continence and (iii) a patent passageway and a reliably consistent method

of achieving complete bladder evacuation by either voiding or CISC.

If this strategy fails and renal function deteriorates, the choice in most cases is between an ileal conduit diversion and augmentation cystoplasty with CISC. The main advantage of the latter is that it reduces intravesical pressure whilst maintaining the integrity of the lower urinary tract, so that no stoma is created.

Thus augmentation cystoplasty is considered a safe and effective method of restoring lower urinary tract function in the renal transplant cases especially in pediatric renal transplant population with a small noncompliant bladder.^{4,5} Many of these patients would have been augmented as part of the management of their neuropathic bladder and thus will present for transplant evaluation with an augment already constructed. For those who are not already augmented and in whom it is required, the timing of augmentation cystoplasty is a matter of some debate. Most would advise undertaking the reconstructive surgery as soon as abnormal bladder function is recognized before transplantation, so that immunosuppressive regimens do not influence the healing process. However, even when abnormal bladder function has not been recognized before transplantation, successful bladder augmentation has been undertaken subsequently with no significant morbidity, although augmentation should be deferred until the dosage of immunosuppression has been reduced to a minimum. Some advocate augmentation cystoplasty after renal transplantation to avoid the problems of the 'dry' cystoplasty, including mucus production and pyocystis, and cystoplasty necrosis caused by technical problems at the time of transplantation.⁶

In a study conducted in Brazil⁴, long-term results of renal transplantation in 25 patients with bladder dysfunction and augmentation cystoplasty were reviewed retrospectively. Twenty kidneys (80%) were functioning at a mean follow-up of 53.2 months (range: 6 to 118). The actuarial graft survival at 1, 2, and 5 years was 96%, 92%, and 78%, respectively. Complications included symptomatic urinary infection, ureteral stenosis, and lymphocele. It was concluded that augmentation cystoplasty is a safe and effective method to restore function in noncompliant bladders and renal transplantation can be performed safely after augmentation cystoplasty.

Fontaine E et al⁵ reviewed 14 renal transplant recipients with an augmentation cystoplasty and concluded that augmentation cystoplasty is safe and effective for restoring lower urinary tract function in children needing a renal transplant and who have a small uncompliant bladder. Similarly, Zaragosa MR et al⁷ reviewed 11

patients with an augmentation cystoplasty who underwent renal transplantation and reported that nine grafts survived at a mean follow-up of 30.1 months. Aki FT et al⁸ also reported augmentation cystoplasty to be a safe and effective option to treat patients with end-stage renal disease undergoing kidney transplantation.

More recently, there have been conflicting results about the safety of cystoplasty before renal transplantation. Basiri A et al⁹ conducted a study to evaluate the outcome of kidney transplantation in children with and without prior cystoplasty. A total of 43 children with bladder dysfunction in urgent need of cystoplasty were enrolled in the study and were compared to a control group with regard to acute and chronic rejection rates, survival of the transplanted kidney, surgical complications and febrile urinary tract infection. It was found that the rates of febrile urinary tract infection and chronic rejection were significantly higher in patients with prior cystoplasty. Also, graft loss was much more frequent in these patients. In patients with prior cystoplasty graft survival rates were 92%, 73%, 58% and 45% at postoperative years 1, 3, 5 and 7, respectively. In the control group these rates were 94%, 87%, 81% and 75%, respectively. Based on these findings they concluded that the survival rate of the kidney is significantly lower in children with prior cystoplasty, possibly due to the higher prevalence of chronic rejection and febrile urinary tract infection in this group.

CONCLUSION

Although there are several reports of renal transplantation with augmentation cystoplasty published in the international literature, our case is first, reported locally.

Although renal transplantation in patients with an augmented bladder has a little better survival of graft, we have no reservations about the safety of this procedure. These patients are at a greater risk of postoperative complication and the operating team should have a high index of suspicion for early detection and management of any complications.

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Address of Correspondence: Dr. Ghulam Murtaza Gondal, Senior Registrar, Department of Medicine, Foundation University Medical College & Hospital, Rawalpindi. Phone: 051-5788150-435, Cell: 0333-5108397
E-mail: drgmgondal@hotmail.com