ELSEVIER

Successful Long-Term Outcome Utilizing Existing Native Cutaneous Ureterostomy for Renal Transplant Drainage Without Ipsilateral Native Nephrectomy

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MANY RENAL transplant candidates with end-stage renal disease (ESRD) have bladder or ureterovesicular junction dysfunction, and without modification these candidates are considered to be poor candidates for renal transplantation (RT).[1] Currently, many of these patients undergo urological reconstruction or repair before their transplant such as with ureteral undiversion[2] to a previously dysfunctional bladder with bladder augmentation.[3] These reconstructions seem to be associated with less morbidity compared to diversion procedures alone. However, for many patients undiversion or bladder augmentation is not an option, and they require urinary diversion prior to RT.

One alternative proposed by Levitt, et al in 1979 is urinary diversion of transplanted kidneys through a cutaneous ureterostomy (CU).[4] They reported two cases of successful utilization of the distal remnant of native cutaneous ureterostomy for an allograft transureteroureterostomy after native nephrectomy. However, many clinicians have been hesitant to utilize this technique of urinary diversion for fear of distal stenosis, stricture, and necrosis secondary to the fragile distal vasculature, and because the preoperative work-up and the procedure are often not always more simplified than the creation of a conduit.[5]

Both conduits and transuretero-ureterostomy (both require native nephrectomy) are often major surgical undertakings, thus a more simplified alternative would be welcome. One solution to these concerns is to forgo native nephrectomy and transplant the allograft ureter onto native cutaneous ureterostomy leaving the native kidney in place. The long-term experience with use of a preexisting native CU via ipsilateral transplant ureteral native ureterostomy for transplant drainage without native nephrectomy is unreported. To determine the indications, complications, and efficacy of this procedure, we report our experience.

METHODS

Between 1993 and 1998 five patients (two males, three females) had undergone end (nonloop) cutaneous ureterostomy 18 ± 12 years before a renal transplant (four cadaveric and one living-related transplant) at our institution. All five had developed ESRD from congenital urological anomalies with reflux secondary to neuropathic (three) or absent (two) bladders. No patient had a preexisting history of stomal stenosis, recent urinary tract infections, or pyelonephritis after CU. All patients had negative serial pretransplant lavage cultures of their native kidneys and ureters to rule out the possibility asymptomatic bacteruria or subclinical pyelonephritis. Thus the rationale for safely leaving the native kidney(s) depended on a high degree of confidence that there were no renal or ureteral focus for ongoing infections following transplantation. Stomal size ranged from 18 to 36 French. These highly selected patients elected to keep CU for urinary drainage for RT.

Procedures

The kidneys were placed in the upright (normal) position in either ileac fossa. The normal position of the allografts did not need to be altered for successful completion of the transplant uretero-native uretero anastomosis. After the appropriate arterial and venous anastomoses of transplanted kidneys, transplant ureters were spatulated distally and joined to a native ureter intraperitoneally with a running absorbable suture. The length of spatulation was 2 to 3 cm. Stents were fixed in place and passed up to the renal pelvis of the transplanted kidney(s) and brought out through the cutaneous ureterostomy. Postoperatively, all patients had either a retrograde ureterogram or a ureteroscopy for evaluation of their neoureterostomy. All transplants were performed by one surgeon (PNB).

RESULTS

All patients had well functioning cutaneous ureterostomies for 6 to 38 (18 ± 12) years with a median of 16 years prior to renal transplantation (Table 1). They were surgically diverted with a cutaneous ureterostomy at a mean of 7 years (ages 2 to 13) of age and had pretransplant dialysis for 23.4 ± 7.5 months. They were transplanted at a median 26 and mean 23 years of age; and were followed up for 36 ± 6.6 months. All five patients continued to have functioning renal transplants at the time of their last follow-up (100% actuarial graft survival at 3 years). Mean serum creatinine for all patients at last follow-up was 1.5 ± 0.6 mg/dL. There were posttransplant complications in three patients. The mean postoperative time to a complication was 14 ± 9 months. Of the five patients studied, three had complica-

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Table 1.

#	Age	Sex	Type RT	Total F/U	SCr Last -F/U	ESRD	Age RT (y)	Age CU (y)	CU (y)	Pre-RT Dialysis Months	Complication
1	42	M	LRRT	31	1.9	Exstrophy	40	2	38	16	Uretero-ureteral stenosis
2	24	F	CRT	47	1.1	MM/NGB	19	6	13	20	Stomal retraction from weight gain
3	34	M	CRT	38	2.1	Spina Bifida/NGB	29	13	16	22	Stomal retraction: from weight gain; urosepsis
4	23	F	CRT	33	0.7	Uro Genital Sinus	22	5	17	23	None
5	21	F	CRT	32	1.9	NN/NB	15	9	6	36	None
Mean ± SD				36.2 6.6	1.54 0.6		25 9.8	7 4.1	18 12	23.4 7.5	

MM = meningomyelocele; NGB = neurogenic bladder; NN = non neuropathic; CU = cutaneous ureterostomy; RT = Renal transplant; LR = Living related; CRT = Cadaveric renal transplant; SCr = Serum creatinine (mg/dL); SD = Standard deviation.

tions that were readily corrected and did not lead to significant long-term morbidity or allograft compromise. One had a stomal retraction requiring dilation and later the development of urosepsis requiring a conversion to an ileal conduit because of continued weight gain. The patient was not considered for local stoma revision because of continued progressive weight gain. Another patient developed a stomal stenosis responding to a revision of the stoma. The third patient developed a ureteroureteral anastomotic stenosis successfully treated with an endopyelotomy. There was no mortality associated with these complications, and the renal graft remained functioning throughout, limiting the morbidity to only that associated with a further procedure. Two patients had no complications postoperatively and had well functioning ureterostomies at the time of their last follow-up at 33 and 32 months postoperation.

CONCLUSION

There are advantages to utilizing a preexisting cutaneous ureterostomy. If an existing cutaneous ureterostomy were not used, a more complicated and potentially morbid creation of a conduit with native kidney(s) removed during or prior to the renal transplant would be required. If diverted prior to the transplant, the recovery phase could significantly prolong the wait for a kidney and increase the patient's time on dialysis. A significantly higher morbidity can be anticipated by creating urinary diversions during a transplant. Other advantages of preserving the native cutaneous ureterostomy include the immediate availability of a well-functioning drainage system, low incidence of reflux thereby limiting future damage to the transplanted kidney, and the limitation of metabolic derangements and mucus production often found in patients with conduits.

We present the first report of the preservation of a cutaneous ureterostomy without native nephrectomy. The advantages of transuretero-ureterostomy without removal of the native kidney are both theoretical and practical. One would anticipate that ureteral blood supply would be better preserved when its proximal renal blood supply is intact. Practically, the extent of the operation is significantly circumscribed to a relatively straight forward uretero-ureteric anastomosis, which can be attributed to the peculiarity of our procedure. The complications associated with non-nephrectomy CU for transplant drainage are easily corrected with no associated long-term morbidity. Our experience with five patients suggests that a preexisting native CU can serve as a receptacle for transplant ureteral drainage in selected patients with excellent long-term function. This procedure should be considered over the use of ileal conduits for selected patients.

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