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BRIEF REPORT

Dai D. Nghiem

Use of a single stent for double ureter support in transplantation

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D. D. Nghiem (✉)
Transplantation Services,
Allegheny General Hospital
and the Medical College of Pennsylvania,
320 East North Avenue,
Pittsburgh, PA 15212-4772, USA

Abstract A technique for draining both ureters of renal allografts with a single stent is described. The method simplifies the endoscopic removal of the stent.

Key words Kidney transplantation, double ureter · Ureter duplication, kidney transplantation, single stent

Introduction

Ureteral reimplantation in kidney transplantation can be performed intravesically via a cystotomy (Politano Leadbetter method) or extravesically using an ureteral graft onlay (Gregoire-Lich procedure). Both techniques are associated with a leakage rate ranging from 3.7 % to 15 %, depending on whether adult or pediatric kidneys are used [1, 5]. Recently, the routine use of indwelling ureteral stents has obviated this complication in a small series of double pediatric enbloc renal transplants [3]. However, the technique was cumbersome since two ureteral stents were used, requiring two endoscopic passes for their removal. A new technique was developed whereby both ureters were decompressed by a single catheter that could easily be removed, and it is this technique that is described here.

Fig. 1 The use of two single pigtail catheters to drain the ureters in double en-bloc kidney transplants

Materials and methods

From February 1987 to June 1993, 444 renal transplantations were performed at Allegheny General Hospital. Fifty-eight double pediatric en-bloc kidneys and one adult kidney with a double ureter were implanted in adults. The first 17 double pediatric kidneys were transplanted unstented using the intravesical Politano-Leadbetter method. The subsequent ureteroneocystostomies were performed using an extravesical method and were supported by two separate stents in 22 patients (Fig. 1 a) and by one double pigtail catheter in the remaining patients (Bard Urological Division, CR Bard Division, Covington, Ga.). The stent was left in place for 10 days and was removed in the outpatient clinic. The technique using a single stent is described herein.

Both ureters were freshened and their blood supplies accurately ligated. They were spatulated posteriorly, stented with a 4.7 Fr double pigtail catheter, and anastomosed together with absorbable monofilament polyglyconate suture. The stent loop was then

Fig. 2 Single catheter stenting of both ureters. Note that the two limbs of the single catheter have been sutured together in a side-to-side fashion at their straight end

Fig. 3 Intravesical extrusion of double pigtail catheter causing intermittent obstruction of bladder outlet

inserted into the bladder. After sutures were inserted on the heel and the toe of the conjoined ureter tips, both ureters were railroaded down to the bladder and anastomosed full thickness to the bladder mucosa in a running fashion. The wide 3-cm long extramucosal detrusor myotomy was then closed over the distal ureters without tension. After experiencing two instances of ureteral catheter extrusion, this technique was modified in the following way. The double pigtail catheter was bent in the middle and the shafts were sutured together with fine polypropylene sutures so that both pigtails flared out as a Lippes loop (Fig. 2). All of these procedures were performed under 2.5 × magnification with loupes in order to minimize the number of technical imperfections.

Results

Two leaks occurred in two patients whose ureters were stented individually, one due to necrotizing cytomegalovirus ureteritis and the other to thrombosis of one of the two kidneys. In both cases, the leaks were repaired successfully. In the transplants where a single stent was used, there were two instances of catheter migration, causing intermittent obstruction of the bladder outlet and requiring emergency endoscopic stent removal (Fig. 3). In the nonstented ureter group, no leaks were observed. No stenosis was documented in the three groups after a 6 to 74-month follow-up.

Discussion

Urinary leaks following transplantation continue to pose a threat to the graft and to the recipient, whether intravesical or extravesical techniques of ureteroneocystostomy are employed [4, 5]. They are most likely related to the tension at the ureteroneocystostomy site, the degree of distal ureteral ischemia, and the high intraluminal pressure of the urinary tract during the early post-transplant period, when the use of large doses of steroids delays healing of the anastomosis. The use of stents in this series as well as others [3–5] permits the decompression of an edematous ureter during the postoperative period and diminishes the technical mishap of suturing the posterior wall of the miniature ureters of infant kidneys. The use of a single catheter to stent both ureters simplifies its removal since only one endoscopic pass instead of two is required. Extrusion of the catheter has not been encountered since the two shafts of the bent catheter have been sutured together.

The paucity of immediate leaks and the lack of late intrinsic stenoses reinforce the concept that extreme care should be taken to avoid devascularizing the ureter during organ procurement and to avoid further ischemia caused by manipulation of the ureter at the time of anastomosis to the bladder. Extrinsic compression by lymphocele or hematoma, which has been associated with 17.6 % of extraperitoneal kidney transplants, was also obviated by the intraperitonealization of the medial kidney [3].

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