Single tunnel extravesical ureterocystostomy in pediatric en-bloc kidney transplantation

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Sir: Separate ureterocystostomies are a popular method of urinary tract reconstruction in double pediatric kidney transplantation [1, 4]. An alternate procedure, using a single tunnel, that has proved satisfactory is described here.

Following induction of general anesthesia, the bladder is filled with 60 cc of 0.1% cephalosporin solution and the indwelling Foley catheter is clamped. After completion of graft vascularization [3], both ureters are spatulated posteriorly, stented with 4.7 Fr pigtail catheters, and anastomosed together with monofilament polyglyconate (Fig. 1 A). A 3-cm detrusor myotomy is made on the anterosuperior surface of the bladder, first with the cautery and then with the cold knife, until the mucosa bulges through widely (Fig. 1 B). This is facilitated by undermining the muscular edges. The bladder is then opened at the caudad part of the incision. Both ureteral stents are inserted into the bladder and the full thickness ureter is anastomosed to the bladder mucosa in a running fashion with polyglyconate suture, starting respectively at the heel and at the toe of the common ureteral opening. A watertight closure is obtained (Fig. 1 C). The detrusor is closed without tension over the distal ureter, creating a nonconstricting extramucosal tunnel 2.5 cm long (Fig. 1 D–F). The wound is irrigated with antibiotic solution and closed without drain. The Foley catheter is left in for 6 days. The ureteral stents are removed 2 weeks later.

From December 1989 until December 1990, this technique was used in 20 adult patients weighing 59–134 kg (mean 75.6 kg) who received en-bloc kidneys from infants weighing 8–16 kg (mean 10.9 kg). No patient experienced urinary extravasation or ureteral obstruction after a 2–14-month follow-up period. No urinary tract infection was documented during the period of ureteral stenting.

Large series reporting on en-bloc pediatric kidney transplants [1, 3, 4] have described individual Politano-Leadbetter ureterocystostomies for urinary tract reconstruction. Advantages of the single tunnel ureterocystostomy described here are: minimal vesical dissection, avoidance of a second cystotomy incision and/or a separate ureteral reimplantation, shorter operating time, and, most importantly, the possibility of using short ureters, which are the panacea of pediatric en-bloc kidneys. The lack of complications observed speaks for this procedure itself, since urological complications have been known to occur in 10%–15% of all pediatric transplants [2]. The large extra mucosal tunnel still effectively preserves the anti-reflux mechanism demonstrated on the cystogram.

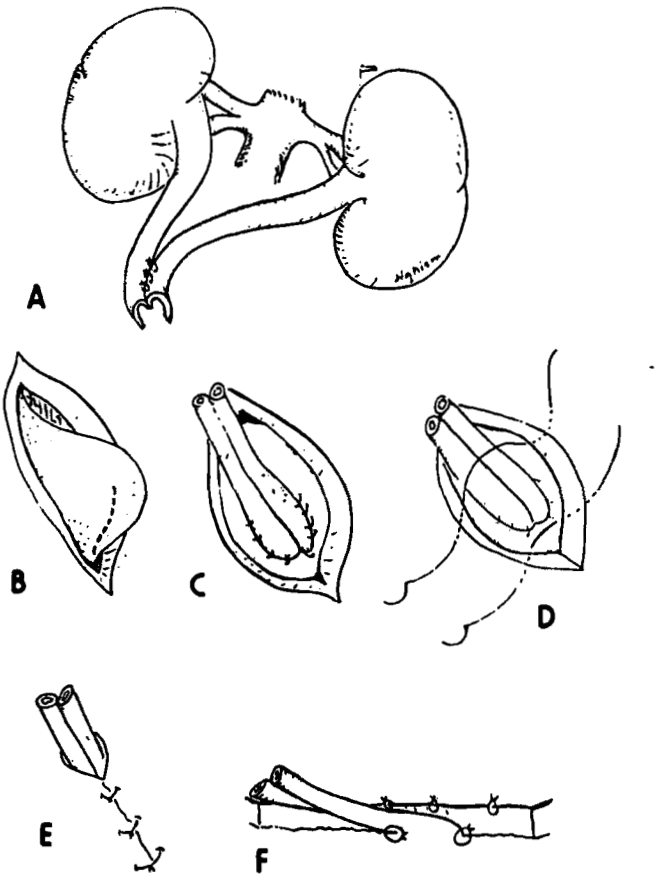

Fig. 1. A. After revascularization of the en-bloc kidneys, both ureters are spatulated and anastomosed together (for the sake of clarity, the ureteral stents have been omitted here). **B** A wide extramucosal tunnel is created after detrusor myotomy. The *dotted line* shows site of mucosal opening. **C** The ureters are anastomosed full thickness to the mucosa. **D** The detrusor is closed over the ureters, creating a nonconstricting tunnel shown in **E**. **F** Cavalier cross-section of ureterovesical junction showing the anti-reflux ureteromucosal flap

References

1. Gruessner RWG, Matas AJ, Lloveras G, Fryd DS, Payne WD, Sutherland DER, Najarian JS (1989) A comparison of single and double pediatric cadaver donor kidneys for transplantation. Clin Transplant 3: 209–214
2. Hayes JM, Novick AC, Streem SB, Hodge EE, Bretan PN, Graneto D, Steinmuller DR (1988) The use of single pediatric cadaver kidney for transplantation. Transplantation 5: 106–110
3. Schneider JR, Sutherland DER, Simmons RL, Fryd DS, Najarian JS (1983) Long-term success with double pediatric cadaver donor renal transplants. Ann Surg 197: 439–442
4. Trevino G, Dickerman RM, Coggins JT, Greene W, Freeborn W, Vergne-Marini P (1988) The optimal use of pediatric donors for renal transplantation. Transplant Proc 20: 359–362