

Dominoes – dogma or drama?

S. W. H. Kendall, D. Aravot, P. A. Mullins, T. R. Graham,
R. J. Harwood, S. R. Large, and J. Wallwork

The Transplant Unit, Papworth Hospital, Papworth Everard,
Cambridge CB3 8RE, UK

Received September 5, 1991/Accepted September 17, 1991

Sir: We read with interest the editorial “Dominoes-pragmatism or piracy?” by Dr. Cooper regarding his opinion of heart-lung transplantation and ‘domino’ transplantation. He also reports the excellent results of his centre with bilateral lung transplantation; his 10% mortality at 1 year compares very well to the 20% mortality worldwide [2].

However, there is considerable dogma in his article concerning heart-lung transplantation, i.e. the potential cardiac complications, the “piracy” of the limited donor pool, the efficacy of the operation for end-stage pulmonary disease and the ethics of ‘domino’ transplantation. We would like to address each of these points, including the effect of prolonged ischaemia on lung transplants.

At our centre we have now performed a total of 112 heart-lung transplants, of which 30 patients have donated their heart for ‘domino’ transplantation. Actuarial 1-year survival for heart-lung transplantation is 75% compared to 91% for ‘domino’ heart-lung donors [1]. Moreover, there has been no significant morbidity in these patients due to cardiac complications such as rejection, denervation or coronary occlusive disease, which Dr. Cooper alludes to as potential problems.

Centres that perform ‘domino’ transplantation do not “distort organ distribution”; a strict rota by the British Transplantation Service offers the organs evenly to each centre. That centre may use the organs for their own unit and will offer unplaced organs to other centres. Historically, the ‘domino’ hospital has used the generated heart for its own recipients. We have used 21 of 30 ‘domino’ hearts. However, of the last 10 ‘dominoes’, we have exported 6 to other transplant centres in the United Kingdom, and “conflict” has not been generated between heart and heart-lung centres. Dr. Cooper also suggests that heart-lung recipients have to wait longer than bilateral

lung recipients for a suitable donor. In our experience we have not encountered a donor in whom both lungs are transplantable but not the heart; however, if the situation arose, the heart-lung centres in the United Kingdom, all of which have lung transplant programs, would still be able to utilise the organs.

Dr. Cooper concludes from the 3.5-year survival of six double lung transplants that bilateral lung replacement is the valid surgical option for end-stage lung disease despite a 25% mortality. Long-term outcome in bilateral lung transplants needs to be assessed. The function of the second lung with the prolonged ischaemic time will be most interesting as we have demonstrated a correlation between prolonged ischaemic time and recurrent rejection episodes, which predisposes to obliterative bronchiolitis [4]. To say that his early results raise “serious ethical considerations” with regard to heart-lung transplantation is premature and is a damning statement about a successful operation that has established long-term results (55% survival at 3 years). At present, heart-lung transplantation is an acceptable operation in end-stage lung disease, and it would be unethical not to use the heart for a ‘domino’ procedure [3].

The role of bilateral lung replacement in the treatment of end-stage lung disease is a dramatic development in patients with reasonable cardiac function. Long-term results must be assessed and compared to heart-lung transplantation before condemning this established and successful surgical approach. While heart-lung transplantation remains the ‘gold standard’, the use of the ‘domino’ heart remains an excellent method for utilising the limited organs available.

References

1. Aravot D, Scott JP, Mullins PA (1991) Outcome of organs shared in the “domino” procedure. *Transplant Proc* 23: 2016–2017
2. Kriett JM, Kaye MP (1991) The registry of the International Society for Heart and Lung Transplantation. *Heart Lung* 10: 491–498
3. Scott JP, Aravot D, Mullins PA (1991) Heart lung transplantation: “domino donation”. In: Land W, Dosseter JB (eds) *Organ replacement therapy: ethics, justice and commerce*. Springer, Berlin, pp 541–542
4. Scott JP, Sharples LD, Fradet G (1991) Risk factors in acute lung rejection. *Transplantation* (in press)

Single tunnel extravesical ureterocystostomy in pediatric en-bloc kidney transplantation

Dai D. Nghiem

Transplantation Services, Allegheny General Hospital,
320 East North Avenue, Pittsburgh, PA 15212-9986, USA

Received March 12, 1991/Accepted July 1, 1991

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 proce-

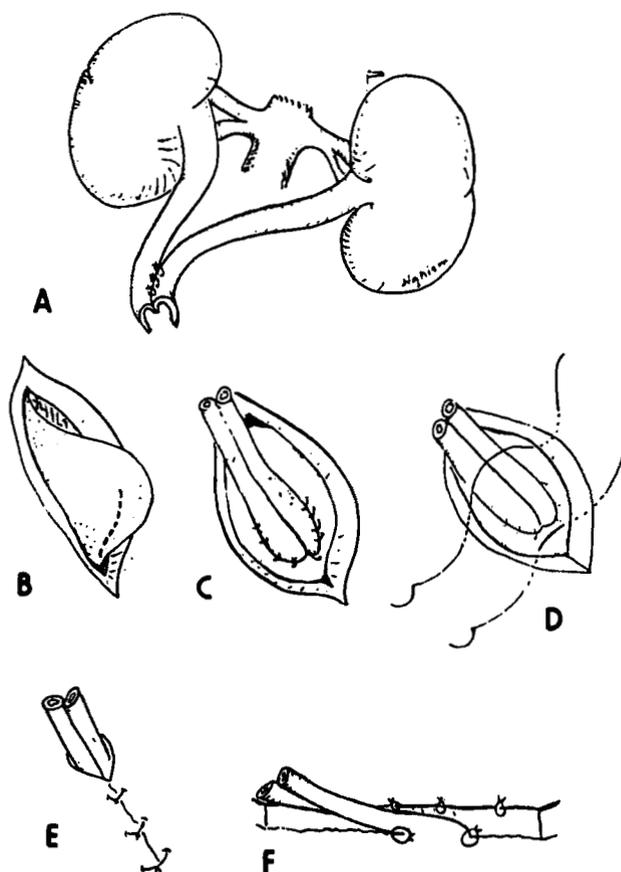


Fig. 1. A. After revascularization of the en-bloc kidneys, both ureters are spatulated and anastomosed together (for the sake of clarity, the ureteral stents have been omitted here). B A wide extramucosal tunnel is created after detrusor myotomy. The dotted line shows site of mucosal opening. C The ureters 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

cedure 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.

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, Strem SB, Hodge EE, Bretan PN, Granto 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