

# RENAL TRANSPLANTATION BETWEEN MONOZYGOTIC TWINS DISCORDANT FOR UNILATERAL RENAL AGENESIS

**N. C. NEVIN, B.Sc., M.D., M.R.C.P.E.,**

Human Genetic Unit, Department of Medical Statistics,  
Queen's University, Belfast

**J. McEVOY, M.D., M.R.C.P.,**

Renal Unit, Belfast City Hospital  
and

Department of Physiology, Queen's University, Belfast

TO DATE 30 renal transplant operations have been carried out in Belfast. Cadaver donors accounted for 28 of these. One patient received a kidney from his father. We present here the first successful case of renal transplantation between monozygotic twins to have been carried out in Ireland. The recipient developed renal failure as a result of a congenital abnormality not present in the donor.

## CASE REPORT

The patient was a 26 year old man who presented with typical symptoms of end-stage renal failure in December, 1971. Prior to this he had always been well, though his mother remembered that he had a "chill on the kidneys" at the age of 6 years. The family history was negative for renal disease. He had a twin brother.

On examination he was clinically anaemic and uraemic. Blood pressure was 130/80 mm Hg. Blood urea 310 mg%; CO<sub>2</sub>CP 10 mEq/l, electrolytes otherwise normal; G.F.R. 3.9 ml/minute; Hb 8.3 g%; serum calcium 7.3 mg%; serum phosphorus 9.4 mg%; alkaline phosphatase 7 K.A. units; barium meal and micturating cystogram showed no abnormality; Australia antigen negative; height 5 ft. 8 in.; H L-A type 2, 8, W27. Blood group 0 Rh. Positive.

He was treated with a Giordano-Giovanetti diet but without drugs or sodium restriction. An arterio-venous fistula was created surgically to facilitate haemodialysis when required. With dietary restriction the blood urea fell to 48 mg%. G.F.R. remained less than 5 ml/minute.

His twin was admitted for investigation as to monozygosity, and as a potential kidney donor. Facial similarity was striking, but he was 4 inches taller than his brother. H L-A type 2, 8, W27, blood group 0 Rh. Positive, and identical with his twin to 10 sub-groups. Blood urea 25 mg%; electrolytes normal; G.F.R. 115 ml. per minute. Intravenous pyelogram showed 2 normally functioning kidneys; renal arteriogram also showed 2 normal kidneys with vasculature suitable for transplantation; M.S.S.U. was sterile and contained no protein or abnormal elements.

Pre-transplant nephrectomy was carried out on the uraemic twin on 25th May, 1972. The right kidney was found to be absent, and the left small and scarred.

The father of the twins was of blood group B Rh. Positive, and their mother 0 Rh. Positive. The parents differed in four other sub-groups. The probability, calculated by the method of Smith and Penrose (1955), that the twins were identical was  $p=0.9910$ .

Following nephrectomy the patient was maintained on twice weekly haemodialysis until 22nd June, 1972, when the donor's right kidney was transplanted into the recipient's left iliac fossa. No immunosuppressive therapy was given. Renal function was adequate to sustain the patient from the immediate post-operative period without further dialysis. When last seen on 20th October, 1972, his G.F.R. was 87 ml per minute;; blood urea 51 mg%; haemoglobin 14.9%; calcium 10.6 mg%; phosphorus 3.8 mg%; M.S.S.U. was sterile and free from protein.

The donor made an uncomplicated recovery.

#### DISCUSSION

Congenital unilateral absence of a kidney is a fairly frequent finding, occurring in 1 in 600 to 1 in 1000 autopsies (Longo and Thompson, 1952; Thompson and Lynn, 1966). The condition is more common in males than in females, and usually presents clinically between 35 and 45 years. The fact that our patient presented in terminal renal failure at 26 years and was 4 inches shorter than his brother indicates possible renal insufficiency of long standing, and suggests that the contralateral kidney may have been the site of congenital disease or abnormality as is known to occur in 25 per cent of cases.

The frequency of congenital malformation is about twice as high in monozygotic twins as in single births, while there is no increase in dizygotic twins (Stevenson et al, 1966). Few examples of congenital renal abnormalities in twins have been reported. Waardenburg (1952) observed monozygotic twins concordant for unilateral renal agenesis; one with a right and the other with a left solitary kidney. An extensive review of the literature by Warkany (1971) did not reveal any further examples of congenital renal agenesis in twins. Our patients would therefore appear to be the first reported example of monozygotic twins discordant for unilateral renal agenesis.

The ethical problems involved in the transplantation of kidneys from living donors have been clearly spelt out by McGeown (1968). Most workers in the field would now agree with her that live donors should only be used in very exceptional cases, or for transplants between identical twins. The results of identical twin transplants are so superior to others that the risks are usually considered justified. However, when the transplant is between identical twins special difficulties arise which must be taken into account. Firstly, there is the risk of recurrence of the disease causing the original renal failure in the transplanted kidney. Secondly, there is always the possibility that the healthy donor will subsequently develop the disease which caused renal failure in his twin brother. In these respects our patients were singularly fortunate in that uraemia developed on the basis of a congenital abnormality which obviously could not recur in the recipient and clearly would not now develop in the donor.

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Requests for reprints to Dr. J. McEvoy, Renal Unit, Belfast City Hospital, Belfast BT9 7AB. BT9 7AB.

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