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RENAL HOMOGRAFTS IN PATIENTS WITH MAJOR  
DONOR-RECIPIENT BLOOD GROUP  
INCOMPATIBILITIES

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Between November 24, 1962, and May 15, 1963, 12 renal homografts were done at the University of Colorado Medical Center. In half of the cases, a kidney was provided by a donor of the same major blood type as the recipient. In the other half, the major blood groups of the donor and recipient patients were different. The present study is concerned with an analysis of the results in these comparative series, in order to determine what influence the presence or absence of major blood group compatibility had upon the early success rate.

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## METHODS

The blood types and the genetic relationships of the donors and recipients are shown in Table I. Each group contained a set of male

Table I—Clinical Data

PATIENT NO.	DONOR-RECIPIENT BLOOD TYPES	DONOR-RECIPIENT RELATION	DATE TRANS-PLANTATION	RENAL FUNCTION 6-1-63	ADJUVANT SURGERY
COMPATIBLE BLOOD TYPES					
1	B+—B+	Mother-son	11-24-62	Good	Thymectomy, splenectomy
2	A+—A+	Fraternal twins	2- 9-63	Good	Thymectomy, splenectomy
3	A+—A+	Unrelated volunteer	3-26-63	Sepsis, rejection *	Thymectomy, splenectomy
4	O+—O+	Brother-brother	4-17-63	Good	Thymectomy, splenectomy
5	A+—A+	Cadaver	4-19-63	Ruptured kidney homograft, 12 days †	Thymectomy, splenectomy
6	O+—O+	Brother-brother	5- 8-63	Good	Splenectomy
INCOMPATIBLE BLOOD TYPES					
7	B+—A+	Sister-brother	1-30-63	Good	Thymectomy, splenectomy
8	A+—AB+	Wife-husband	2-25-63	Good	Splenectomy, thymectomy
9	A+—O+	Cadaver	3-19-63	Sepsis, rejection **	None
10	O+—A+	Wife-husband	5- 3-63	Good	Splenectomy
11	O+—A+	Fraternal twins	5-10-63	Good	Thymectomy, splenectomy
12	O+—O—	Unrelated volunteer	5-15-63	Good	Splenectomy

NOTE: All patients or cadavers were male unless otherwise indicated.

\* Died 10 days

† Awaiting second homograft

\*\* Died 24 days

fraternal twins, as well as one cadaver donation. The periods of renal ischemia were comparable in the 2 groups. Genetic relationships were slightly more favorable in the series with matched blood types. The basic antirejection therapy in every case consisted of azathioprine (imuran), although Patient 1 also received total body irradiation. Eleven of the 12 patients received splenectomy or splenectomy plus thymectomy. The method of homograft preservation differed in the 2 groups. With compatible blood types, total body donor hypothermia and systemic heparinization were employed. With blood type differences, the donor patients were neither cooled nor heparinized, but the kidney was perfused after removal with cooled lactated Ringer's solution (15° C.), to which procaine chloride (1 gm./L.) and heparin (50 mg./L.) were added. Mannitol, 250 to 800 mg./kg., was given during and after renal revascularization.

#### RESULTS

Urine flow began in a few minutes or hours in all except Patient 5, in whom urine was never produced in significant quantities. In Patients 3 and 9, urine output of 2,000 to 3,000 cc. per day occurred, but the BUN did not return to normal. In the other 9 patients, massive diuresis of 6,000 to 16,000 cc. per day resulted in prompt resolution of azotemia. The immediate behavior of the homografts was not significantly influenced by the presence or absence of blood group compatibility.

Except for Patient 2, all patients underwent a rejection crisis which was first evident 4 to 27 days after transplantation. This was reversed by the addition of actinomycin C and massive steroid therapy to the pre-existing therapy. Neither the vigor nor the reversibility of rejection was related to blood type similarities or differences.

#### SUMMARY

Renal homografts from donors with blood types different from those of the recipient patients have provided satisfactory renal function in 6 patients for as long as 4 months. The early success rate under these circumstances has been comparable to that attained in a companion series in which donor-recipient major blood groups were identical.