

Research article

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The outcome of kidney transplants with multiple renal arteries

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Abstract

Background: The use of grafts with multiple renal arteries has been considered a relative contraindication because of the increased incidence of vascular and urologic complications. The aim of this study is to determine whether the kidney grafts with multiple arteries have any adverse effect upon post-transplant graft and patient survival.

Methods: We reviewed the records of 225 adult kidney transplants done consecutively at our institution. Twenty-nine patients (12.8%) had grafts with multiple renal arteries. We analyzed the incidence of post-transplant hypertension and vascular complications, mean creatinine levels, patient and graft survival. In 17 cases reconstruction was done as conjoined anastomosis between two arteries of equal size, and in 6 cases as end-to-side anastomosis of smaller arteries to larger arteries. Multiple anastomoses were performed in 6 cases.

Results: In one patient postoperative bleeding occurred. Mean systolic blood pressures, creatinine levels at first year and last follow-up and complication rates were all in acceptable ranges. There was no significant difference in graft and patient survival between multiple and single renal artery allografts.

Conclusion: Although the kidney grafts with multiple renal arteries have been considered a relative contraindication because of the increased risk of complications, in our study allografts with multiple arteries were used successfully in kidney transplantation.

Background

Although graft and patient survival have significantly improved because of standardization in surgical technique and immunosuppressive therapy, grafts with anatomic variants are still challenging problems to the surgeon. Of these variants, multiple renal arteries are the most common. The use of these grafts has been considered a relative contraindication because of the increased incidence of vascular and urologic complications [1]. In this retrospective study, we reviewed the outcome of kidney transplantation using allografts with multiple renal arteries.

Methods

We reviewed the records of 225 adult kidney transplants done consecutively at our institution. Twenty-nine patients (12.8%) had grafts with multiple renal arteries. The surgical management of multiple arteries was variable. In 17 cases reconstruction was done as conjoined anastomosis with two arteries of equal size, and in 6 cases as end-to-side anastomosis of smaller arteries to larger arteries. Multiple anastomoses were performed in 6 cases. All patients received standard triple-drug immunosuppressive therapy consisting of a calcineurin inhibitor, azathioprine or mycophenolate mofetil, and steroids [2]. We

Table 1: Characteristics of the patients who received allografts with multiple renal arteries (n = 29).

Male/female	24/5
Mean age	34.7 ± 11.1 years
Living/cadaver	21/8
Mean follow-up	53.3 ± 36.9 months
Mean creatinine (12 month)	1.98 ± 0.72 mg/dl
Mean creatinine (last follow-up)	2.79 ± 1.77 mg/dl
Mean systolic blood pressure	142.3 ± 24.8 mmHg
Vascular complication	in one patient
Urologic complication	none

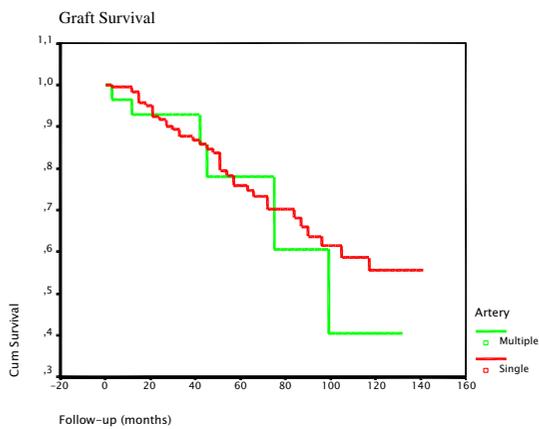


Figure 1

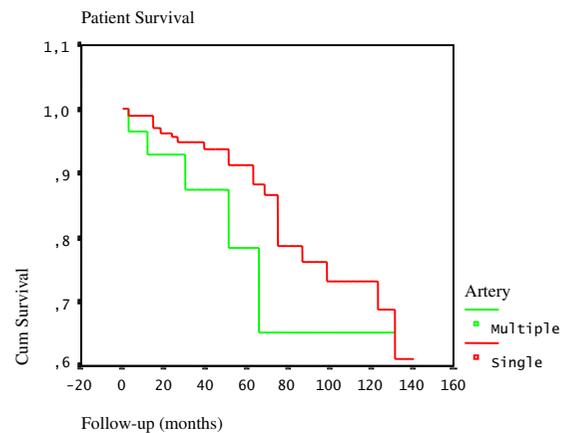


Figure 2

analyzed the incidence of post-transplant hypertension and vascular complications, mean creatinine levels at 1 year and at the last follow-up along with patient and graft survival. Patient and graft survival were compared to recipients with single artery renal allografts (n = 196).

Results

Of the 29 patients who received allografts with multiple renal arteries, the male/female ratio was 24/5. Mean age was 34.7 ± 11.1 years (range: 17–59 years). Twenty-one patients (72.4%) had grafts from living-related donors. Mean follow-up was 53.3 ± 36.9 months (range: 18–144 months). Mean creatinine levels at first year and at the last follow-up were 1.98 ± 0.72 mg/dl and 2.79 ± 1.77 mg/dl, respectively. Mean systolic blood pressure at the last follow-up was 142.3 ± 24.8 mmHg (range: 110–200 mmHg). Postoperative bleeding from the anastomosis requiring surgery occurred in one patient. There was no other complications including urologic complications (Table 1). One- and 5-year graft survival by life-table analysis was 93% and 78%, and 95% and 73% in multiple and single renal artery allografts, respectively (p = 0.89) (Fig-

ure 1). One- and 5-year patient survival by life-table analysis was 93% and 65%, and 96% and 88% in multiple and single renal artery allografts, respectively (p = 0.14) (Figure 2). Graft survival was also analysed between the groups according to the reconstruction technique. One- and 5-year graft survival in patients with conjoint anastomosis, end-to-side anastomosis, and multiple anastomosis was 94% and 75%, 82% and 82%, 100% and 80%, respectively (p = 0.84).

Discussion

According to several autopsy series, the incidence of multiple renal arteries ranges between 18% to 30% [3]. The incidence in our patient population with renal transplants was 12.8%. Various techniques have been described for reconstruction of multiple renal arteries [4]. To date, none of the reconstruction techniques has been proven to be superior to the other in reference to complication and graft survival rates [5]. There was no significant differences in graft and patient survival between multiple and single renal artery allografts in our study. We preferred to join the arteries together extracorporeally as a single renal

artery to form a common stem if suitable. Among the multiple artery allografts, we could not demonstrate any significant difference in graft survival in patients with various reconstruction techniques. Mean systolic blood pressures, creatinine levels at first year and last follow-up and complication rates were all in acceptable ranges.

Conclusion

Although the kidney grafts with multiple renal arteries have been considered a relative contraindication because of the increased risk of complications, allografts with multiple arteries were used successfully in kidney transplantation in our study.

Competing interests

None declared.

Authors' contributions

CA and IT: designed the study, IB and BY: reviewed the patient records,

GA: performed the statistical analysis.

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