

Postrenal Transplant Urinary Leakage Caused by Segmental Infarction of a Renal Allograft Treated by Partial Nephrectomy

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Abstract

Kidney transplant is the final treatment for patients with end-stage renal disease. Urinary leakage is the most-common surgical complication early after transplant. Another complication in the early posttransplant period is segmental allograft infarction. We report a kidney recipient who developed urinary leakage secondary to a segmental infarction of the upper pole of the transplanted kidney 2 months after transplant.

The patient was treated successfully by a partial nephrectomy of the infarcted upper lobe of the kidney. Three months after the partial nephrectomy of the allograft, serum blood urea nitrogen and creatinine were normal, and the patient was able to partake in her daily activities. Partial nephrectomy in the context of infarction of a kidney allograft is safe and can be used in similar cases.

Key words: *Kidney transplant, Partial nephrectomy, Urinary leakage, Segmental infarction, End-stage renal disease*

Kidney transplant has been established as a treatment of patients with end-stage renal disease and is performed in many transplant centers worldwide. However, complications are still frequent after transplant and jeopardize graft function. Segmental renal infarction is one of these complications in the early posttransplant period that

may cause graft dysfunction.¹ Its incidence has been reported to be from 4% to 42% in different studies, and is generally the result of disruption or thrombosis of the renal arterial branches.¹ There is no well-defined treatment for this condition, and the transplanted kidney usually is removed completely. We report a patient with urinary leakage after a kidney transplant caused by an upper pole infarction of the kidney allograft that was successfully treated with a partial nephrectomy of the involved lobe.

Case report

A 20-year-old woman with end-stage renal disease of unknown origin on peritoneal dialysis underwent kidney transplant from a deceased donor in September 2009 at our transplant center. After the transplant, she received antithymocyte globulin and methylprednisolone as induction of an immunosuppressive regimen. Afterwards, she was maintained on cyclosporine, mycophenolate mofetil, and corticosteroids, and generally, she has been in good condition with a serum creatinine maintained at 2.4 mg/dL and blood urea nitrogen at 30 mg/dL. In November 2009, two months after the transplant, she presented to our emergency department with a high-grade fever, diarrhea, and decreased urine output.

Results of a physical examination revealed a young, conscious girl with a temperature of 39°C (orally), a pulse rate of 96 beats per minute, and blood pressure of 110/70 mm Hg. The results of her history and physical examination were normal, except for tenderness at the site of the transplanted kidney. Serum creatinine was elevated at 3.5 mg/dL and blood urea nitrogen rose to 40 mg/dL. Results of serum electrolytes and liver function tests were normal. Urinalysis was positive for protein and

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Experimental and Clinical Transplantation (2011) 2: 153-155

blood. Blood urea nitrogen and creatinine on the second day of admission were 49 mg/dL and 4.1 mg/dL. Antibiotics were initiated, and the patient underwent color Doppler ultrasonography of the transplanted kidney. The transplanted kidney was 95 mm long, and the upper half was smaller in size, with cortical thinning (suggestive of infarction of the upper pole of the transplanted kidney). There also was a perinephric collection surrounding the upper pole of the kidney with homogenous low-level internal echoes. The renal veins were normal in structure and blood flow; however, a thrombosis was found in the superior branch of the renal artery. Voiding cystourethrogram was performed, but no leakage was observed from the ureteroneocystostomy or the site of ureteral anastomosis to the bladder. Antibiotics were continued but without any improvement, and our patient was febrile on the fourth and fifth days of her admission with a gradual increment in blood urea nitrogen and serum creatinine. After a discussion, the patient was a candidate for a partial nephrectomy, and written, informed consent was given by the patient and her family. The blood urea nitrogen and creatinine on the day of operation were 46 mg/dL and 4.8 mg/dL.

The transplanted kidney was approached through a previous hockey stick incision. The upper pole of the kidney was totally necrotic and whitish (Figure 1), and leakage was seen from the necrotic part of the kidney after filling the bladder with methylene blue. The upper pole then was removed, and the collecting system was repaired with PDS4/0 (Figure 2). A double-J stent was inserted and the skin

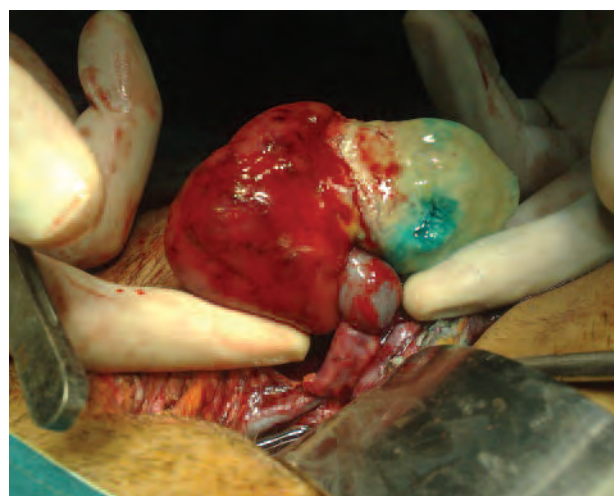


Figure 1. Segmental infarction of the upper pole of a renal allograft.

was sutured. The patient remained hospitalized for 7 days. She became afebrile 2 days after operation, and her creatinine decreased to 4.3 mg/dL. Gradual decreasing of the serum creatinine and blood urea nitrogen continued the next day, and the patient was discharged with blood urea nitrogen of 35 mg/dL and a creatinine of 3.1 mg/dL. Three months after the partial nephrectomy, she was completely well, and her serum creatinine diminished to 1.7 mg/dL and blood urea nitrogen to 25 mg/dL.

Discussion

We described a young woman with urinary leakage in the early postkidney transplant period who was found to have an infarction of the upper lobe of the transplanted kidney after color Doppler ultrasonography of the transplanted kidney. A double renal artery was present in the kidney allograft with a thrombosis of upper branch of the renal artery. The patient deteriorated while in the hospital, and conservative management with antibiotics was not helpful. Therefore, she underwent removal of the infarcted upper pole of the transplanted kidney. Thereafter, her graft function significantly improved, and she was discharged in good condition.

Urinary leakage is the most-common complication in the early postkidney transplant period. Its incidence is estimated to be 8.9%.² The most-common causes of urinary leakage are necrosis and suture failure owing to vascular insufficiency.³ Segmental infarction of transplanted kidney can be divided into early and late onset. While early segmental infarction has been reported to be associated with graft tubular damage,⁴ prolonged



Figure 2. Partial nephrectomy of the upper pole of a transplanted kidney.

ischemia,⁴ graft edema, and diminished perfusion⁵; late onset of infarction is known to be associated with cyclosporine toxicity.⁶ Treatment of such conditions depends on the size of the infarction and the function of allograft, comorbidities, and the condition of the patient. If the infarcted area is small, conservative management with maintenance of adequate renal perfusion and an immunosuppressive regimen is suggested. An operation should be used for those patients with extensive graft infarction.⁷ Although partial nephrectomy is frequently used as a treatment for tumors of the kidney under some circumstances,⁸ there are only 2 reports of its application for infarction of a kidney allograft.^{9, 10} Both of these cases were reported as an infarction of the lower pole of the transplanted kidney successfully treated by nephron-sparing surgery. In previous reports, the involved kidneys were completely removed.

Saving kidney allografts also has been reported in other surgical complications after kidney transplant. Haberal and associates treated a late, spontaneous, parenchymal perforation of an allogenic kidney transplant by a nephrostomy tube.¹¹ Graft repair was applied during another study to save a ruptured kidney allograft.¹²

Transplant is an expensive procedure both economically and emotionally for recipients, donors, and their families, and imposes large expenditures on the country's health system. Therefore, preservation of an allograft as long as possible seems to be both cost-effective for the patient and community. In the current study, graft function normalized after partial

removal of the transplanted kidney, and the patient greatly improved. Therefore, this treatment can be considered for such similar cases in the future.

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