Case report

Native ureter substitution for entire necrotized ureter after cadaveric kidney transplantation: A case report.

Satit Siriboonrid, Sarayuth Kanrchanatarayont, Vittaya Jiraanankul, Veerayuth Viriyabundithkul, Nattapong Binsri

Division of Urology, Department of Surgery, Phramongkutklao Hospital, Bangkok, Thailand

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Abstract

The rate of kidney transplantation is rising in Thailand. Cadaveric kidney transplantation is being performed more frequently in several hospitals. We report on a patient with severe complications from aggressive graft dissection, and the measurement required for correcting this event from our experience.

Corresponding author: Satit Siriboonrid
Address: Division of Urology, Department of Surgery, Phramongkutklao Hospital, Bangkok, Thailand
E-mail: tonsatit@gmail.com

Introduction

Kidney transplantation is a common modality for end-stage renal disease patients in Thailand. Not only it can offer satisfaction for patients, but it can decrease the mortality rate when compared with long-term hemodyalysis. The rate of organ donation is increasing every year; thus, cadaveric kidney transplantation is being performed more frequently in several hospitals in Thailand. There are important steps in kidney transplantation. Not only must the steps of organ harvest be performed well, but kidney preparation before it is taken to the new location is also very important. Surgeons should conserve tissues around the renal hilum and periureteric tissue because the ureter of the translated kidney receives its blood supply from the graft only, not from the other parts of the recipient. This report will review the severe complications from aggressive graft dissection, and the measurement required for correcting this event from our experience.

Case scenario

A 50-year-old Thai man who suffered from end-stage renal disease received a new kidney from the cadaveric donor. Cold ischemic time was nearly 20 hours. After the graft's dissection was in the surgical tray, the vascular surgeon found two lacerated defects at the renal pelvis and upper ureter. Each lesion was 0.5 centimeters in diameter. After all of the vascular processes were finished, we evaluated the graft again and found naked renal pelvis and ureter (without surrounding fatty tissues). Lacerated wounds at the renal pelvis and upper ureter were repaired with 5-0 chromic catgut suture (interrupted fashion). Ureteral stent was placed along the renal pelvis to the recipient's urinary bladder.

First day after the operation, the patient had a low-grade fever. Plain film abdomen showed a good position of the ureteric stent; 200 milliliters of urine was found in his urine bag and 2 liters of drainage fluid from Jackson's pratt. Drainage fluid was yellowish with a clear appearance. We sent it for creatinine in order to compare it with serum creatinine. It was 5 times more concentrated than serum creatinine. After a discussion with the nephrologist, we decided to use a conservative measurement for urinary leakage. Larger bore urethral catheter (22 Fr.) and antimuscarinic drugs were used for this protocol. One day later, drainage fluid still leaked continuously, 3,000 milliliters in volume. Urine bag presented only 100 milliliters of urine. He had lower right abdominal discomfort and low-grade fever. Therefore, we made the decision to explore the surgical site.

After wound exploration, large amounts of fluid were removed (Figure 1). We found necrotized tissue from the anterior part of the renal pelvis and along the ureter (Figure 2). Peristalsis was observed for 10 minutes but couldn't be noticed. The kidney parenchyma was well contoured with consistency.

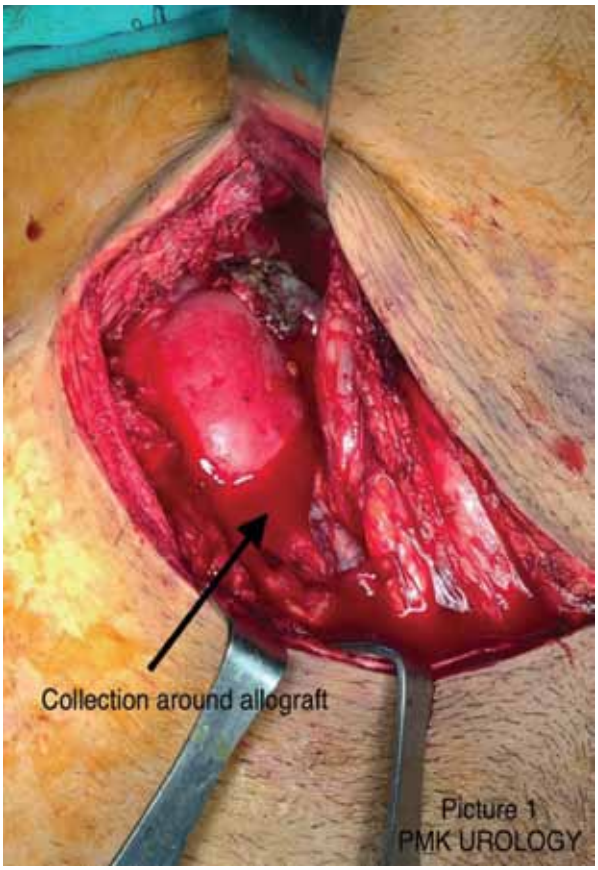

Figure 1. Three hundred milliliters of fluid collection was found after surgical site exploration.

Perivesical area was examined with manual palpation. We couldn't mobilizethe urinary bladder due to severe fibrosis at the pelvic area.

We decided to use the native ureter instead of the bladder boari flap for the renal pelvis and ureteral substitution. Peritoneal approach was done from the median side of the iliac fossa; 300 milliliters of ascites fluid was removed from the abdominal cavity. Right native ureter was identified and mobilized. It showed good blood supply and peristalsis. We mobilized the ureter about 15 centimeters far superior from the ureterovesical junction without thermal dissection. Periureteric tissue was preserved as much as possible with sharp cutting. Metzenbaum was used for ureteral transaction and the upper end was lighted with silk No 1-0. Native ureter was mobilized to the extraperitoneal area without angulation and tension, as seen in Figure 3.

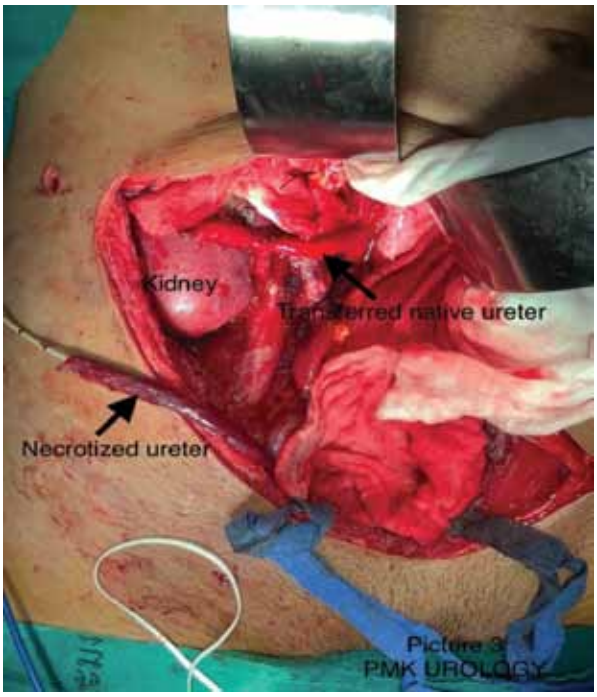

Figure 3. The right native ureter was transferred to the area of allograft renal pelvis without tension and angulation.

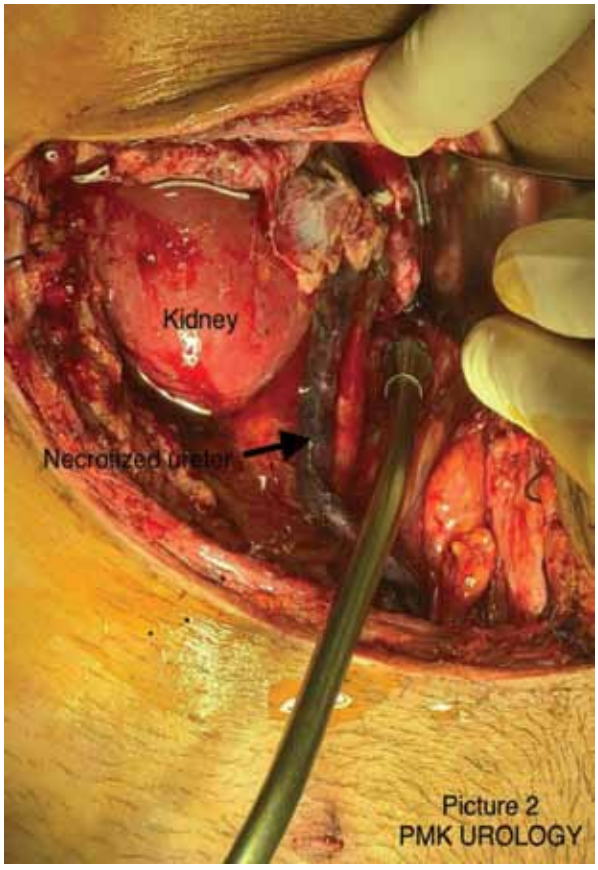

Figure 2. The entire necrotized renal pelvis and ureter of transplanted kidney.

Transplanted renal pelvis and ureter were excised. Bladder was repaired, two layers, with absorbable materials. We found good appearance of the posterior limb of the renal pelvis and we kept it for reconstruction. Native ureter was spatulated at the end with sharp scissors, 2 centimeters in length. Large ureteral stent was placed within the native ureter. Posterior limb of allograft renal was secured to the native ureter (native pyeloureterostomy) with monofilament absorbable material No 5-0 (interrupted fashion) then the bladder was filled with normal saline solution, 300 milliliters for leakage proofing, as seen in Figure 4.

Result

We spent 3 hours on this procedure. Three liters of urine was recorded from the urine bag, with 15 milliliters of fluid from the Jackson's pratt drainage tube. Drainage fluid was serum from chemical analysis when compared with serum creatinine on the first day after definite surgical correction. Last few days,

silastic drainage tube was removed. Urethral catheter was removed at day 14 after the operation. We retained the ureteric catheter within his body for 1 month and removed it via flexible cystoscope. He can now live with a new kidney without hemodialysis.

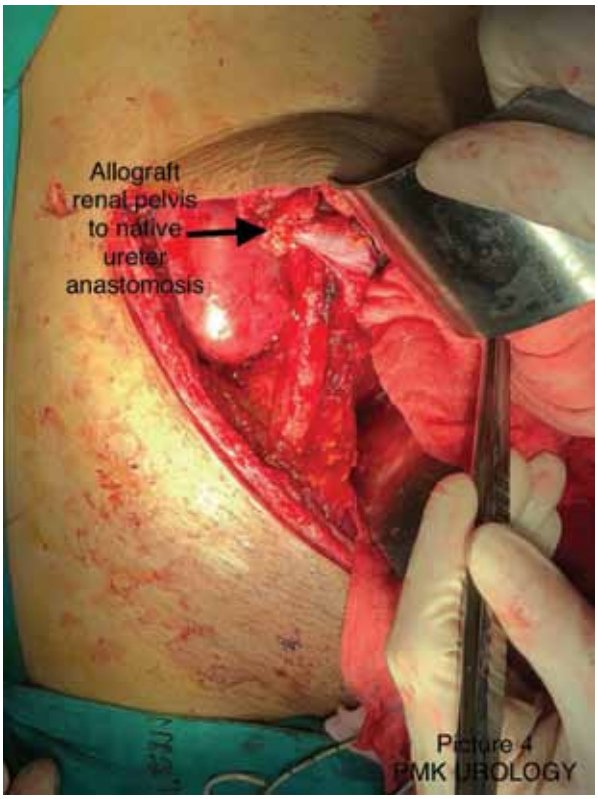

Figure 4. The anastomosis between splatulated native ureter and the posterior part of the allograft renal pelvis.

Discussion

Reconstruction of the urinary tract after kidney transplantation is possible using several measurements. External ureteroneocystostomy is the most common surgical procedure[1,2]. The complication rate for this technique was reported to range from 2.9-9%;[3-6] it can lead to infection, urine fistula, and to graft loss. The main causes of ureteral problems are poor graft harvesting techniques with destruction of a lower pole artery, stripping of the ureter, or surgical problems at the time of implantation. Unfortunately, the incidence of ureteral complications is more or less stable over the years, although this fact is well known and the harvesters do their best to improve their explant procedures. High dose steroid therapy and chronic rejection are mentioned as further risk factors. Primary ureteral stenting can be a helpful tool, although ureteral problems can also occur in stented patients[7]. If graft dysfunction after transplantation occurs and graft rejection can be excluded, the diagnosis can usually be matched by ultrasound, nuclear isotope scanning or kidney biopsy.

A main complication in the early phase after kidney transplantation is leakage of the ureterocystostomy. Although conservative measurements have been described[8], open surgical revision seems to be the most satisfying intervention. In most cases, the problem can be solved by redoing or repairing the anastomosis.

In cases where long segmented stenosis or necrosis of the distal ureter, or other conditions, require surgical reconstruction of the graft ureter, we prefer native pyeloureterostomy using the ipsilateral recipient's ureter to treat ureteral necrosis in renal transplant patients. Native pyeloureterostomy is a common rescue technique[9,10]. In a necrotized ureter, the dilated pelvis of the grafted kidney is usually quite accessible, and minimal mobilization of the native ureter is sufficient to approximate those two structures for anastomosis. Nevertheless, a ureteroneocystostomy is possible if the stenotic segment is short and the blood supply of the distal graft ureter is intact. In some cases, e.g., if the native ureter is not available due to prior ipsilateral nephrectomy, the Boari flap or psoas hitch procedure can be used as alternatives in the management of very short transplant ureters. A good option to treat complete necrotic ureter and pelvis is to use a vascularized small-bowel patch and the ipsilateral native ureter. Stenosis of a native ureter is a rare problem and can be excluded by retrograde ureteropyelography in suspected cases on the table with fluoroscopy.

Conclusion

Native pyeloureterostomy is a safe and efficient method for handling ureteral complications after renal transplantation, especially in necrotized ureter of the graft. The incidence of urinary complications was appropriately low. We performed this technique with good results.

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