Treatment of Urinary Fistula After Kidney Transplantation


ABSTRACT
Urinary fistula is a common complication after kidney transplantation and may lead to graft loss and patient death. Its current incidence ranges from 1.2% to 8.9%. From December 1993 to April 2007, 1223 kidney transplant procedures were performed by our kidney transplantation team. In 948 recipients (group 1), we performed an extravesical ureteroneocystostomy, and in 275 recipients (group 2), a terminoterminal ureteroureterostomy (UU). We observed urinary fistulas in 43 patients (3.5%), with mean onset at 6 days (range, 3–20 days) posttransplantation. Urinary fistula was significantly more common in group 1 compared with group 2 (4.1% and 1.5%, respectively; \( P < .05 \)). The distal ureteral necrosis was the major frequent cause of urinary fistula (n = 34; 76.7%), which required either a second ureteroneocystostomy or UU using the native ureter. Of these 21 fistulas, including 10 recurrent fistulae, were successfully treated with pedicled omentum covering the anastomotic stoma. Conservative treatment with a stent and Foley catheter drainage for 1 to 2 weeks was successful in 8 patients. All patients with a urinary fistula regained normal graft function except 1 in whom transplant nephrectomy was necessary because of pelvic and ureteral necrosis. There was no recipient loss secondary to urinary fistula. In conclusion, UU can decrease the incidence of urinary fistula after kidney transplantation. Most urinary fistulas require surgical management; and pedicled omentum is useful to repair the fistula.

URINARY FISTULA, the most common complication during the early period after kidney transplantation, occurs at a rate of 1.2% to 8.9%. It arises frequently as a result of technical problems during procurement or transplantation surgery, and may cause graft loss and patient death. Our transplantation team performed 1223 kidney transplant procedures between December 1993 and April 2007. We sought to determine the incidence and to evaluate the treatment and outcome of urinary fistula.

MATERIALS AND METHODS
A retrospective review was performed of the medical records of 1223 kidney transplant recipients. Urinary fistula was determined with attention to various methods of establishing urinary continuity. We recorded the number, incidence, treatment, and outcome of urinary fistulas. Demographic data included recipient and donor age and sex, type and duration of dialysis, HLA mismatch, and living or cadaver donor. Harvesting and transplantation procedures were performed according to usual technique. The 1223 patients were divided into 2 groups according to the method of establishing urinary continuity. Group 1 consisted of 948 patients in whom extravesical ureteroneocystostomy (UNC) (Lich-Gregoir technique) was performed with routine use of an indwelling ureteral stent. Group 2 consisted of 275 patients with anuria in whom a termino-terminal ureteroureterostomy (UU) technique was used.

RESULTS
There were 1154 grafts (94.4%) from cadaver donors and 69 grafts (5.6%) from living donors. Seven hundred fourteen patients (58.4%) were men, and 509 patients (41.6%) were women. All patients were followed up for at least 1 year posttransplantation. Comparison of patient demographic data in groups 1 and 2 are given in Table 1. Urinary fistulas were observed in 43 patients (3.5%), with mean onset of 6 days (range, 3–20 days) posttransplantation. Thirty-nine of these patients (4.1%) were in group 1. Of these, bladder fistulas occurred in 5 patients. Conserva-
We used the UNC technique in 948 recipient routinely with a stent. The incidence of urinary fistula was 4.1%. The UU method was used in 275 patients with anuria; the incidence of urinary fistula was 1.5% ($P < .05$). One important reason for the observed lower rate of urinary fistula compared with the UNC technique may be the use of a shorter ureter. The use of ureteral stents in renal transplantation is controversial. Recently, it was reported that routine use of a double J stent prevented ureteral complications after kidney transplantation. However, other surgeons have reported that routine ureteric stenting is unnecessary in patients at low risk for urologic complications. Refinement of surgical techniques and the introduction of new immunosuppressive protocols have also decreased the incidence of urologic complications.

Ureteral necrosis was the most frequent cause of urinary fistula in our study, corresponding to 76.7% (33 of 43 patients). Several other risk factors for the development of urinary fistula include recipient age, number of renal arteries, site of arterial anastomosis, occurrence of acute rejection episodes, bladder dysfunction, and immunosuppressive regimen.

Many options for the treatment of urinary fistula have been described, with different rates of success: UU, UNC, pyeloureterostomy, percutaneous nephrostomy associated with ureteral stenting, and prolonged vesical drainage. In our experience, early open surgery is a major approach; conservative treatment can be used to treat a fistula resulting from imprecise suturing, such as bladder fistula. In our study, 70.6% of fistulas resolved with 1 operation; however, 10 patients needed a second operation because of recurrence of the fistula. Recurrences were due to insufficient ureteral resection, leaving an ischemic stump extension or an inadequate anastomosis. In recent years, we have used pedicled omentum to cover the anastomotic stoma to repair a urinary fistula, and urinary fistulas rarely recurred. The reason may be that omentum is enriched with blood and lymph vessels, and, thus, has strong absorptive, repair and anti-infective abilities.

In conclusion, UU can decrease the incidence of urinary fistula after kidney transplantation. Most urinary fistulas require surgical management, and pedicled omentum is useful for repair. Long-term graft and recipient survival are not affected if a urinary fistula is correctly treated.

REFERENCES


<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Group 1 (n = 948)</th>
<th>Group 2 (n = 275)</th>
<th>P</th>
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<tbody>
<tr>
<td>Sex, M/F</td>
<td>563/385</td>
<td>151/124</td>
<td>NS</td>
</tr>
<tr>
<td>Age at transplantation, mean (SD), y</td>
<td>42.6 (11.8)</td>
<td>38.5 (10.9)</td>
<td>NS</td>
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<td>Dialysis duration, mean (SD), mo</td>
<td>14.7 (10.2)</td>
<td>13.8 (9.3)</td>
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<td>Hemodialysis-peritoneal dialysis</td>
<td>803:145</td>
<td>241:34</td>
<td>NS</td>
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<td>Donor age, mean (SD), y</td>
<td>37.6 (8.3)</td>
<td>37.8 (7.6)</td>
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<td>Cadaver donor–living donor</td>
<td>897:51</td>
<td>257:18</td>
<td>NS</td>
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<td>HLA mismatch, mean (SD)</td>
<td>3.2 (1.1)</td>
<td>3.1 (1.4)</td>
<td>NS</td>
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<tr>
<td>Treatment duration, mean (SD), mo</td>
<td>62.6 (43.9)</td>
<td>67.8 (49.1)</td>
<td>NS</td>
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