

Impact of Pre-transplant Dialysis Duration, Bladder Capacity, and Length of Submucosal Tunnel of Ureteroneocystostomy on the Prevalence of Vesicoureteral Reflux to the Graft and Graft Survival

Introduction and Objective: Patients with anuria due to long-term dialysis show a distinct decrease in the bladder capacity and compliance. It can be difficult to make a submucosal tunnel of adequate length to prevent vesicoureteral reflux (VUR) with a small bladder capacity. This study investigated the impact of the pre-transplant dialysis duration, bladder capacity, and the length of submucosal tunnel of ureteroneocystostomy on the prevalence of VUR to the graft, and its influence on the graft survival.

Materials and Methods: We have employed anti-reflux ureteroneocystostomy using an anterior extravesical technique without a stent. A submucosal tunnel was created at approximately but less than 3 cm between 1998 and 2006 (Group 1, n=102) and more than 3 cm since 2007 (Group 2, n=62). Voiding cystography was performed in 164 adult renal transplant recipients immediately before and one year after transplantation to measure the bladder capacity and confirm the existence of VUR.

Results: The median age (range) was 46 (19-71) years old. The median pre-transplant dialysis duration was 60 (0-426) months. The median pre- and post-transplant bladder capacity was 165 (15-600) and 376 (117-1,000) ml, respectively. The bladder capacity and compliance expanded more than 2-fold from pre-transplantation to 1-year post-transplantation. Thirty-six (22%) patients had VUR to the graft. A significant difference was found between Groups 1 and 2 in the dialysis duration (72 vs. 40 months, respectively, $p=0.00036$), pre-transplant bladder capacity (134.5 vs. 215.7ml, respectively, $p=0.00019$), and the prevalence of VUR ($n=30$, 29.4% vs. $n=6$, 9.7%, respectively, $p=0.002$). In addition, the prevalence of VUR in patients with less than a 100-ml pre-transplant bladder capacity was 53.3% in Group 1 and 16.7% in Group 2. This indicates that it is important to make a submucosal tunnel over 3 cm long to prevent VUR to the graft. However, there was no difference in 10-year death-censored graft survival between patients with VUR (100%) and those without VUR (78.5%) (Log-rank $p=0.083$).

Conclusions: Long-term dialysis, pre-transplant small bladder capacity, insufficient length of submucosal tunnel of ureteroneocystostomy may increase the risk of VUR.