

Prevalence and Management of Lower Urinary Tract Symptoms Related to Benign Prostatic Obstruction in a Contemporary Series of Renal Transplant Recipients

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Abstract

Background: The kidney is the most frequently transplanted human organ worldwide. In patients with end-stage renal failure, renal transplantation improves both quality of life and life expectancy. The current literature indicates that the numbers of renal recipients over 60 years of age has increased in recent years.

Objectives: To evaluate the prevalence and management of lower urinary tract symptoms (LUTS) related to benign prostatic obstruction (BPO) in a contemporary series of male renal transplant (RTx) recipients.

Materials and Methods: We retrospectively evaluated 150 consecutive transplant recipients at the University of Jena 12 months postoperatively for the presence and treatment of LUTS related to BPO.

Results: The mean age of the patients was 59 years (range 27 - 82 years). By 12 months postoperatively, 91% (n = 137/150) were off dialysis with a functioning kidney graft. Two patients died during follow up. Six patients had undergone treatment for prostate cancer prior to RTx. Of the remaining 131 patients, 47% (n = 62/131) were considered as patients with BPO 12 months after RTx. Six percent (n = 8/131) of the patients experienced urinary retention due to BPO and 6% (n = 8/131) had a transurethral resection of the prostate (TURP) during the first year after RTx. No major complications were observed in those patients. A significant increase was noted in the use of α -blocker therapy after RTx (P = 0.004).

Conclusions: We observed a high prevalence of LUTS related to BPO in our cohort of patients. Due to the increasing age of transplant recipients, more attention should be paid to the evaluation and treatment of BPO prior to RTx.

Keywords: Renal Transplantation (RTx), Benign Prostatic Obstruction (BPO), Lower Urinary Tract Symptoms (LUTS), Transurethral Resection of the Prostate (TURP), Alpha-Blocker Treatment, Medical Treatment of BPO

1. Background

The kidney is the most transplanted human organ worldwide. In patients with end-stage renal failure, renal transplantation (RTx) improves quality of life and life expectancy. The current literature indicates that the number of renal recipients over age 60 has increased in recent years (1-3).

Optimal medical care is needed to achieve the best possible graft function and survival. One important issue for patients who have undergone renal transplantation is optimal bladder function. However, bladder function is often disturbed by prostate-related problems in male patients older than 60 years.

2. Objectives

This study evaluates the prevalence and management of lower urinary tract symptoms (LUTS) clinically related to benign prostatic obstruction (BPO) in a contemporary series of male renal transplant recipients at a German transplantation center.

3. Materials and Methods

The charts were reviewed for 150 consecutive male patients who underwent isolated RTx at the University of Jena between 2008 and 2012 for end stage renal failure (ESRF). Patients and transplant characteristics were recorded in a database, which included age, time of dialysis prior to RTx, residual diuresis, and postoperative transplant outcome, among other data. The presence of LUTS related to BPO was

evaluated at 12 months postoperatively by reviewing the patient charts for prostate size in estimated grams, mic-turition volume, and residual volume, as well as medical and surgical BPO treatment. Extended urodynamic evaluations by pressure-flow studies, ultrasound of the prostate, and international prostate symptom score (IPSS) were not routinely performed prior to RTX. Patients were considered to have LUTS related to BPO either if it was explicitly mentioned in the medical records or if it was obvious from clinical parameters or findings. The prostate specific antigen (PSA) values and the presence and treatment of prostate cancer were recorded in all patients. The study was approved by the local ethic committee. Chi-square test and t-tests were used for statistical analysis. Statistical significance was considered to be $P < 0.05$.

4. Results

Twelve months after RTX, 91% ($n = 137/150$; 91%) of all patients were off dialysis with a functioning kidney graft. Two patients ($n = 2/150$; 1.3%) died during follow up, both from septicemia caused by pneumonia, with a subsequent multiorgan failure. Eleven patients ($n = 11/150$; 7.3%) had nonfunctioning transplanted kidneys because of immunologic rejection or vascular problems. Additionally, six patients underwent curative treatment for prostate cancer before RTX ($n = 6/150$; 4%; 5 underwent prostatectomy and 1 underwent brachytherapy). All prostate cancer patients had PSA levels below the detection limit of 0.2 ng/mL, both preoperatively and during follow up. Further patient characteristics are given in Table 1. The BPO evaluation 12 months postoperatively was based on the remaining 131 patients. Of these, 47% ($n = 62/131$) were considered to have BPO, either due to symptoms or to medical or surgical treatment for LUTS.

In total, 33% ($n = 49/131$) of the patients underwent alpha-blocker therapy 12 months post RTX, in contrast to only 11% of the patients ($n = 16/131$) before RTX. Comparison of preoperatively to 12 months postoperatively revealed a significant increase in alpha-blocker therapy ($P = 0.004$). A total of 5% ($n = 7/131$) of the patients had undergone a TURP prior to RTX and 6% ($n = 8/131$) had one during the first year after RTX. The post-RTX TURP group included 75% ($n = 6/8$) who were anuric or oliguric before RTX and 25% ($n = 2/8$) who had a diuresis above 500 mL/d. No major complications occurred in these patients after TURP.

During the first 12 months after RTX, 6% ($n = 8/131$) of the patients had an episode of urinary retention due to BPO. Of these, 62.5% ($n = 5/8$) experienced it immediately after transplantation and 37.5% ($n = 3/8$) during the first year. Five of these patients had undergone a TURP during the first year. Urinary infections under immunosuppression

Table 1. Patient Characteristics and Transplant Outcomes

Patients Characteristics	Value
No. of Patients	150
Age at RTX, mean (range), y	59 (27 - 82)
Patients 60 y or older, n	75
BMI, kg/m²	27 (20 - 41)
Time of dialysis, y	5 (0.2 - 24)
Preoperative PSA, ng/mL	1.2 (0.1 - 8.6)
Patients with curative treatment of prostate cancer, n	6
Radical prostatectomy, n	5
Brachy therapy, n	1
No. of transplantations, n = 150	
First transplantation	137
Second transplantation	7
Third transplantation	3
Cause of ESRD, n = 150	
Diabetes	30
Glomerulonephritis	39
PCKD	20
IGA nephropathy	12
Hypertension	15
Reflux/renal shrinkage	13
Other	12
Not known	9
Pretransplant urine output, n = 150	
Anuric	45
Oliguric, < 500 mL	36
Diuresis > 500 mL/d	37
Donation type, n = 150	
Living donor	9
Cadaveric kidney	141
Extended allocation program, old for old; age above 65 y	51
Transplant Outcome, n = 150	
GFR 6 months, mL/min	55.1
GFR 12 months, mL/min	53
1 year graft failure, n	13

after RTX were observed in 37% ($n = 49/131$) of the patients during the first 12 months. Urinary infections occurred in 47% ($n = 29/62$) of the patients diagnosed with BPO and in 62.5% ($n = 5/8$) of the patients who underwent TURP.

The prevalence of BPO increased with age: It was 14%

between 27 - 50 year (n = 3/22), 43% between 50 - 60 year (n = 20/47), and 58% between 60 - 70 year (n = 28/48). Above 70 year, it was 71% (n = 10/14) (Table 2).

Table 2. Prevalence and Treatment of BPO 12 Months After Renal Transplantation^a

Variables	12 Months Post-RTx ^b
Benign prostatic obstruction, BPO	62/13 (43)
BPO treatment	
Alpha blocker therapy	49/148 (33)
Other medical treatment of BPO	None
TURP	9/148 (6)
Urinary retention	13/150 (9)
Immediate urinary	
Retention post RTx	4/13 (31)
Urinary retention because of BPO	8/13 (62)
Urinary retention	
following TURP	5/13 (38)
Urinary infection	61/150 (41)
Urinary infection	
After TURP post RTx	6/9 (66)
Urinary infection in patients with BPO	30/63 (48)
Diagnosis of BPO according to age groups	
27 - 50 y	03/23 (13)
50 - 60 y	21/49 (43)
60 - 70 y	28/54 (51)
Above 70 y	12/19 (63)

^an = 131.

^bValues are expressed as No. (%).

5. Discussion

Renal transplantation is a well standardized operation and the best form of kidney replacement for end stage renal failure (ESRF). The prevalence of benign prostate hyperplasia (BPH) in 60-year-old men is about 60%, and half of them might have significant LUTS and require treatment (4). According to the latest Euro transplant report, the mean age of transplant recipients had increased to 55 years in 2014, with a proportion of patients older than 65 years of 32.8% (3). In our series, these values were even higher, with a mean age of renal transplant recipients of 59 and the proportion of patients older than 60 years of 50%. This explains the high prevalence of BPO in our series and underlines its clinical importance in contemporary transplant series.

The literature contains reports that show the high prevalence of BPO in transplant series (5) as well as the potentially serious post-transplant complications. Tsaur et al. (6) analyzed 103 males transplant recipients older than 60 years and described BPO as the most common cause of postoperative voiding dysfunction. They diagnosed BPO in 26 out of 28 patients (92%) and BPO resulted in a TURP in 21 patients (20%). Gratzke et al. (7) identified a “duration of dialysis longer than 120 months” in 79 patients (P = 0.0174) and “age over 60 years” (P = 0.0045) as a significant risk factor for urinary retention after RTx. Hurst et al. (8) found that BPH increases the risk of transplant loss by a factor of 1.2. Furthermore, several series about complications after RTx identified BPH as a risk factor for urinary retention and postoperative urinary tract infections (2, 9, 10).

In our series, the rates of urinary retentions and urinary infections were also high. Urinary retentions occurred in 8 patients, and in 8 patients a TURP was performed during follow up. Furthermore, we observed urinary tract infections in 41% of the patients during the first year. Although most of these infections were probably due to routine post-transplant ureteral stenting (9), they were apparently also influenced by BPO, as the infection rate was 48% in patients with BPO but only 33% in patients without BPO. Urinary infections were even observed in 66% of the patients who underwent TURP post RTx. In summary, we observed similar post-transplant complication to those reported in other studies. However, no subsequent serious complications were observed for the kidney graft and the patient.

As indicated above, BPO is a relevant issue in renal transplant patients. However, the optimal management of BPO in kidney transplant patients still remains under debate. Diagnosis of BPO prior to renal transplantation is often hampered in anuric and oliguric patients due to the lack of urine production. In many patients, starting a BPO treatment is either impossible or not necessary before transplantation. However, after successful renal transplantation and subsequent normal urine production, BPO treatment often becomes necessary. In our study, this was demonstrated by the fact that the proportion of patients diagnosed with BPO increased from 31% to 47% after transplantation and alpha blocker therapy increased significantly. Additionally, 6% (n = 8/131) of the patients were treated by TURP after renal transplantations during the first year.

Some authors propose urodynamic studies before RTx to prevent serious post-transplant problems and to achieve the best possible pre-transplant management (11). However, Silva et al. (12) recently used cystometry and pressure flow studies to demonstrate that patients with a residual 24 hours urine volume > 200 mL had similar

functional outcome to patients with normal bladders. In our series, we relied only on residual volume, DRU, and LUTS prior to RTx. With our experience, we propose, as do other groups, only to perform extended urodynamic studies with pressure flow and cystometry in patients with urological causes for ESRF or previous urological interventions (7, 13). Another possible approach might to identify at risk patients with severe LUTS after RTx by validated questionnaires literature (14).

In addition to pre-transplant diagnostic measures, surgical interventions also create some controversy. Some authors contraindicate operative treatment of the infravesical obstruction prior to RTx, due to low urinary output and oligoanuria, which, according to their beliefs, facilitates bladder neck contracture (15, 16). They propose to postpone surgical treatment until after renal transplantation (7, 12). Castagnetti found no difference in LUTS in anuric children after RTx compared to recipients with diuria before RTx (17). By contrast, Reinberg, in 1992, described complications in TURP immediately following RTx in 25% of the patients, including one death (15). However, today's surgical options, including TURP and laser techniques, when combined with postoperative interdisciplinary care, are efficient and safe. This was recently shown in a series by Volpe et al. (18) that included 32 consecutive TURPs in patients who had undergone renal transplantation.

Our data point to the high clinical importance of BPO in transplant recipients with increasing age, but they also indicate the clinical relevance of prostate cancer in renal transplant patients. Six patients were diagnosed and treated for localized prostate cancer before transplantation. Under this regimen, with consistent PSA testing and digital exams, no additional prostate cancer was detected during the first year of follow up. In our opinion, this underscores the importance of PSA testing and digital exams, especially in patients with increasing age, prior to renal transplantation.

In summary our data demonstrate the increasing importance of prostate issues in contemporary transplant patients due to increasing age. Our opinion is that BPO should be diagnosed and treated early by an oral medical or surgical treatment in patients with sufficient diuresis before renal transplantation. This might reduce urinary infections and urinary retention after renal transplantation. Anuric and oliguric patients often have masked BPO. According to the literature and our data, TURP can be safely postponed until after renal transplantation.

Footnote

Authors' Contribution: H. John and M. Horstmann contributed equally to this work as senior authors.

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