Impact of Changing Trends in Medical Therapy on Transurethral Resection of the Prostate: Two Decades of Change in China

Runqi Guo, Wei Yu, Kai Zhang, and Ben Xu

OBJECTIVE To retrospectively assess that over the 2 decades, whether medical therapy has changed indications, patient characteristics, and outcomes in men undergoing transurethral resection of the prostate (1992-2013).

METHODS At our institution, medical history of all patients undergoing surgery before 1998, between 2001 and 2003, and between 2011 and 2013 was reviewed. Patient demographics, preoperative clinical profile, clinical management, and operative complications were assessed.

RESULTS A total of 1157 patients were enrolled in the study. Mean ages of patients increased from 67.0 to 70.4 years old over the past 2 decades. Furthermore, comorbidities increased significantly as well. Although prostate size and weight of resected tissue increased from 57.3 to 92.3 g and from 24.3 to 36.6 g, the surgical time decreased from 78.21 to 72.29 minutes. From 2011 to 2013, patients undergoing surgery had their catheters remove earlier (from 5.7 to 4.5 days), whose postoperative days in hospital were shorter (from 9.3 to 4.4 days). Although operative complications decreased from 12.3% to 5.7%, especially bleeding, re-operation due to bleeding increased from 0.4% to 2.7%. Moreover, no statistical difference was observed in operative complications between patients with medical therapy and those without medical therapy.

CONCLUSION The increasing application of medical therapy resulted in surgical interventions delay. The prostate size was significantly greater, as was the weight of resected tissue. Although patients with medication were older with more comorbidities and larger prostates, surgical technique advancements have benefited them and transurethral resection of the prostate is still considered as a safe and recommendable surgical treatment. UROLOGY 92: 80–86, 2016. © 2016 Elsevier Inc.

Benign prostatic hyperplasia (BPH) often causes chronic and progressive lower urinary tract symptoms (LUTS) or complications, which drives men to seek treatment.[1-3] Although progress has been made in techniques, transurethral resection of the prostate (TURP) is still considered to be the "gold standard" for BPH surgical intervention.[4]

In the treatment of patients with symptomatic BPH, the introduction of medical therapy has brought extraordinary changes. After the early 2000s, combination therapy with α-antagonists and 5-α-reductase inhibitors (5-ARIs) has resulted in significant changes in the treatment of LUTS secondary to BPH. Besides, a number of large randomized controlled trials have exhibited short-term and long-term usefulness of these agents in reducing LUTS.[5-7] Therefore, they have currently become primary first-line agents in the treatment of LUTS. Nonetheless, a large number of patients cannot tolerate long-term medical therapy, do not respond to such a therapy, or experience progression. As a result, they will continue to undergo surgical intervention.

Medical therapy has had an enormous impact on management of BPH. Provided that only the need for surgical intervention is delayed by medical therapy, questions regarding TURP arise in the era of medical therapy. Giving the aging population and the lack of data in China, it will be somehow different and advantageous to determine the

Runqi Guo and Wei Yu contributed equally to this paper.

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From the Department of Urology, Peking University First Hospital and Institute of Urology, National Research Center for Genitourinary Oncology, Beijing, China

Address correspondence to: Kai Zhang, M.D., Department of Urology, National Urological Cancer Center, Peking University First Hospital and Institute of Urology Peking University, 8 Xishiku Street, Xicheng District, Beijing 100034, China. E-mail: kaizhangpku@163.com

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effect of medical therapy trend changes on surgical intervention of BPH. In order to address the questions, outcomes in patients who underwent surgery before 1998 (when medical therapy became an important therapy for BPH), between 2001 and 2003, and between 2011 and 2013 (when medical therapy was the primary first-line therapy for BPH) were compared at our institution.

METHODS

From January 1, 1992, to December 31, 1997, from January 1, 2001, to December 31, 2003, and from January 1, 2011, to December 31, 2013, medical history of all patients undergoing TURP was reviewed and collected by trained surgical clinical reviewers in this single-center, retrospective, and cross-sectional observational study. University staff urologists with more than 1 year of BPH surgical experience performed all the operations. In this surgical analysis, patients undergoing open prostatectomy were not included. All aspects of the study comply with Declaration of Helsinki. It was specifically approved that no informed consent was required. The reason was that data were going to be anonymously analyzed.

On the whole, 1157 men ≥18 years undergoing monopolar TURP were identified. Patients were only eligible for inclusion if their primary reason for TURP was BPH. Surgery indication involved moderate-to-severe LUTS, BPH-related complications, insufficient relief of inguinal hernia due to benign prostatic obstruction, and increase of prostate-specific antigen (PSA) to exclude prostate cancer. Under the following 2 conditions, patients would be excluded: those who underwent TURP for prostate carcinoma or chronic prostatitis or their postoperative pathology was not compatible with a BPH diagnosis.

Inpatient charts, anesthetic, operative and pathology reports, and discharge summaries were reviewed. In addition, age, body mass index, International Prostate Symptom Score, quality of life score (QoL), maximum or average urinary flow rate, voided volume, PSA level, and prostate volume were evaluated preoperatively. Besides, surgery indications and comorbidities were recorded. By means of examining clinical data, previous continuous, intermittent, or combined treatment for BPH (antibiotics was not included) was identified. American Society of Anesthesiologists physical status classification was applied as a measurement of overall health status of the patient. The weight of each resection was documented in the operative report and the total surgical time was employed as an indicator of operation complexity. Moreover, blood transfusion and suprapubic cystostomy during operation were evaluated as operative parameters as well. Based on the length of hospital stay after surgery, the postoperative day on which the urinary catheter was removed for a trial of voiding, as well as operative complications, the postoperative course was evaluated. An operative complication was graded by using the modified Clavien classification system.[8,9]

Descriptive data were presented as numbers and percentages. Continuous data were shown as arithmetic mean ± standard deviation. Statistical analysis was performed using the chi-square test for categorical variables and a one-way analysis of variance analysis for continuous variable. To design the most appropriate multivariable model which can predict the complications, univariable logistic regression analysis was first carried out for each explanatory variable. Multivariable logistic regression models including only predictors at univariable analyses ($P < .05$) were then generated. Odds ratios were calculated with 95% confidence intervals. Results were considered statistically significant at $P < .05$. SPSS ver. 22.0 (IBM, New York, NY) was used for the statistical analysis.

RESULTS

With a moderate increase in number in 2011-2013 (474 patients), there was a 99.6% increase of TURPs from 1992-1997 to 2001-2003 (228 and 455 patients, respectively) at our institution. Patient demographics and preoperative variables are shown in Table 1. Mean ages of patients were, respectively, 67.0 ± 6.28, 69.1 ± 6.81, and 70.4 ± 7.41 years old, which increased during the past 2 decades. However, body mass index of patients did not change significantly. Cardiac and cerebrovascular diseases, diabetes, other urologic diseases, and comorbidities increased significantly as well. Medical therapy used for BPH was the most common treatment for patients in the 3 time periods [68.0% (155 patients), 71.2% (324 patients), and 73.8% (350 patients), respectively] with a slight increase but no significance.

Among the 3 cohorts, no difference was observed in International Prostate Symptom Score, peak flow rate, and the mean American Society of Anesthesiologists physical status class. Over the 2 decades, voided volume decreased (165.3 ± 120.9, 149.9 ± 92.0, and 132.2 ± 85.6 mL, $P = .016$). In the first decade, QoL, average flow rate, and PSA did not change. However, when compared with either of the two previous cohorts, QoL and PSA were significantly higher, and average flow rate and voided volume were lower in 2011-2013.

Surgery indications in 1992-1997, 2001-2003, and 2011-2013 are also exhibited in Table 1. The majority of patients undergoing TURP had moderate-to-severe LUTS (53.5%, 57.1%, and 56.8%, respectively). But over the 2 decades, the percentage did not change significantly. The incidence of recurrent urinary tract infection, upper urinary tract dilatation, and increase of PSA to exclude prostate cancer increased, whereas the incidence of recurrent urinary retention decreased from 31.6% to 26.6%. The incidence of other indications involving recurrent hematuria, bladder stone, and insufficient relief of inguinal hernia due to BPO were not significantly different among the 3 cohorts.

In Table 2, the clinical management related to surgery and postoperative course is displayed. Prostate size and weight of resected tissue, respectively, increased from 60.1 ± 31.8 to 97.0 ± 48.4 g and from 24.3 ± 17.4 to 36.6 ± 23.3 g. However, surgical time decreased from 78.21 ± 27.32 to 72.29 ± 33.54 minutes over 2 decades. Between patients with medical therapy and those without medical therapy, no significant difference was observed in prostate size and weight of resected tissue in every cohort. With suprapubic cytostomy during operation, there was a significant decrease in the percentage of patients undergoing TURP under low pressure over time. In addition, contemporary blood transfusion rate has apparently decreased from 12.6% to 4.6%. From 2011 to 2013, patients