Comparison of Holmium Laser Prostate Enucleation Outcomes in Patients with or without Preoperative Urinary Retention

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Purpose: We determine whether outcomes of holmium laser enucleation of the prostate are similar in patients with and those without preoperative urinary retention.

Materials and Methods: From May 2008 to July 2014, 231 patients underwent holmium laser prostate enucleation for symptomatic benign prostatic hyperplasia. Retrospective analysis was performed to evaluate for differences in postoperative outcomes for patients with and those without preoperative urinary retention.

Results: Overall 95 patients (41%) had urinary retention before holmium laser prostate enucleation while 136 (59%) did not. Mean followup for all patients was 15.3 months. Patients with retention tended to be older, have larger prostates, and have higher scores on the AUA SS and bother questionnaires (all $p < 0.05$). Postoperatively there was no difference in rates of complications, including urinary retention. Both groups showed significant improvement in AUA SS and bother score after the procedure at all postoperative points. Median post-void residual was less than 60 ml and median maximum flow rate on uninstrumented uroflow was greater than 18 ml per second at all postoperative points for all patients regardless of preoperative retention status. No patients required long-term catheterization and rates of postoperative complications did not differ significantly during the followup period.

Conclusions: This study represents the first direct comparison to our knowledge of holmium laser prostate enucleation outcomes in patients with or without urinary retention. There was no increased risk of postoperative urinary retention in patients with preoperative retention, and both groups demonstrated significant postoperative improvement in subjective and objective voiding measures.

Key Words: prostate; prostatic hyperplasia; transurethral resection of prostate; lasers, solid-state

Abbreviations and Acronyms

AUA SS = American Urological Association symptom score

BPH = benign prostatic hyperplasia

HoLEP = holmium laser enucleation of the prostate

PSA = prostate specific antigen

PVR = post-void residual

Qmax = maximum urinary flow rate

TRUS = transrectal ultrasound

TURP = transurethral resection of the prostate

Accepted for publication October 20, 2015.

No direct or indirect commercial incentive associated with publishing this article.

The corresponding author certifies that, when applicable, a statement(s) has been included in the manuscript documenting institutional review board, ethics committee or ethical review board study approval; principles of Helsinki Declaration were followed in lieu of formal ethics committee approval; institutional animal care and use committee approval; all human subjects provided written informed consent with guarantees of confidentiality; IRB approved protocol number; animal approved project number.

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Editor's Note: This article is the fourth of 5 published in this issue for which category 1 CME credits can be earned. Instructions for obtaining credits are given with the questions on pages 1176 and 1177.

BENIGN prostatic hyperplasia is one of the most common urological conditions in the aging male population, affecting nearly three quarters of men in the seventh decade of life.[1] Although many patients may be treated successfully with medical therapies, several surgical treatments are now available for those who do not tolerate or fail to respond to medications. While TURP remains the gold standard for surgical management, modern surgical therapies are beginning to shift toward outpatient and laser procedures, with HoLEP among those now recommended by

0022-5347/16/1954-1021/0
THE JOURNAL OF UROLOGY®

http://dx.doi.org/10.1016/j.juro.2015.10.116
Vol. 195, 1021-1026, April 2016
Printed in U.S.A.

the American Urological Association.[2–4] The efficacy and safety of HoLEP have been rigorously evaluated in the literature, with several randomized trials showing success rates similar to or even superior to other bladder outlet procedures.[5–9]

While the primary indication for HoLEP for many men is bothersome lower urinary tract symptoms unresponsive to medications, a significant proportion of men undergo HoLEP for the management of urinary retention. Previous studies have demonstrated that HoLEP is effective and safe in men with urinary retention. However, to our knowledge there are no studies which directly assess objective and subjective outcomes in this patient population.[10] In this study we compare outcomes after HoLEP in men with and those without preoperative urinary retention.

MATERIALS AND METHODS

After receiving institutional review board approval a retrospective review of all patients who underwent HoLEP at a single institution between May 2008 and July 2014 was performed. All patients were evaluated with a basic history, physical examination and urine culture. Preoperative evaluation included the AUA SS with bother score, preoperative PSA, uninstrumented uroflowmetry and PVR in all patients capable of providing a sample. Patients with urinary retention were defined as those using an indwelling catheter or intermittent catheterization for bladder drainage preoperatively. Although the AUA SS is not validated for use in patients with urinary retention, this instrument was used as an adjunct metric to assess subjective, patient perceived improvement in urinary tract function after HoLEP. Patients with indwelling catheters had new catheters placed before intervention and were treated with appropriate culture specific antibiotics, as indicated. Flexible cystoscopy and urodynamics evaluation were performed at the surgeon's discretion on select patients preoperatively. TRUS and/or computerized tomography were used to determine prostate size.

All procedures were performed by a single surgeon (NLM). Patients received intravenous cefazolin preoperatively. Enucleation equipment included a 100W holmium: YAG laser with a 550 μm end fire laser fiber, a 28Fr continuous flow resectoscope with a laser bridge containing a 7Fr stabilizing catheter and normal saline bladder irrigation. Enucleation was performed in a 2 or 3-lobe technique as previously described.[11,12] Once the adenoma was enucleated, tissue was removed from the bladder using the morcellator (Lumenis® VersaCut™) via an offset rigid nephroscope placed through the resectoscope sheath. The mass of the enucleated prostate tissue was obtained from the final pathology report. Standard postoperative protocol included overhead continuous bladder irrigation with normal saline through the morning of postoperative day 1. Hematocrit was checked and the Foley catheter removed on the morning of postoperative day 1 for pathway patients at the discretion of the attending physician. Patients were discharged home after 2 consecutive voids on oral antibiotics, either trimethoprim-sulfamethoxazole or nitrofurantoin monohydrate, for 7 days.

Patients were reevaluated in clinic at 6 weeks, 3 months, 6 months and 12 months postoperatively, with some returning at more than 15 months postoperatively. Symptom questionnaires, uroflowmetry and PVR were repeated at each clinic visit. PSA was checked at the initial followup appointment. Cystoscopy was performed only if symptoms suggested an adverse outcome such as bladder neck contracture or urethral stricture. Adverse events evaluated included postoperative urinary tract infection, bladder neck contracture, urinary retention, urethral stricture or urinary incontinence that persisted 90 days postoperatively.

Statistical analysis was completed using Stata®/IC v13.1. Results are provided as mean values with standard deviations for normally distributed data and median values with interquartile ranges for nonnormally distributed data. Comparative analysis was performed using Student's t-test for continuous data and the chi-square test for categorical data. All statistical tests were 2-sided with $p < 0.05$ considered statistically significant.

RESULTS

A total of 231 patients were identified who underwent HoLEP between May 2008 and July 2014, of whom 95 had urinary retention before HoLEP and 136 did not. Mean followup was 14.6 months in the retention group and 15.8 months in the nonretention group ($p=0.63$). Baseline demographics and preoperative characteristics are presented in table 1. Patients with retention tended to be older, with larger prostate volumes as measured on TRUS, as well as higher AUA SS and bother score. Of the patients with retention 58 had indwelling catheters and 37 were on intermittent catheterization with an overall mean catheterization time of 5.4 months (indwelling catheter group 3.5 months, intermittent catheterization group 8.9 months). There was no significant difference in preoperative PSA between patients in the retention and nonretention groups. Similarly, PSA did not differ significantly between patients with retention with indwelling catheters vs those on intermittent catheterization. Overall 87% of patients in the retention group and 85% of those without retention had been treated with alpha blocker and/or 5-alpha reductase inhibitor therapy before HoLEP ($p=0.70$). Twelve (13%) patients in the retention group and 24 (18%) in the nonretention group had undergone at least 1 prior BPH procedure ($p=0.36$), with TURP being most common in both groups (5 of 95 in the retention group, 10 of 136 in the nonretention group).

Overall 35 patients in the retention group (37%) and 41 in the nonretention group (30%) had preoperative urodynamics performed. Unequivocal