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Office Based Photovaporization of the Prostate for Benign Prostatic Hyperplasia: Outcomes and Patient Satisfaction

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Abstract

Introduction: We determined the efficacy, safety and tolerability of photovaporization of the prostate in the office setting for benign prostatic hyperplasia.

Methods: Between 2009 and 2011, 139 men with moderate to severe benign prostatic hyperplasia based on I-PSS (International Prostate Symptom Score) underwent photovaporization of the prostate using a 980 nm diode laser under local anesthesia. We compared preoperative and postoperative post-void residual urine volume, maximum urine flow and I-PSS/quality of life questionnaire responses. We also evaluated postoperative complications and patient satisfaction survey responses.

Results: An average ± SD of 782.5 ± 811.1 seconds of laser exposure at maximum power (180 W) resulted in a significant change in median post-void residual urine volume (−126 ml or −81.3%), maximum urine flow (4 ml per second or 40.0%) and I-PSS (−19 or −79.2%, each $p < 0.001$). In men with a prostate greater than 70 ml the median change in post-void residual volume was considerably more pronounced at −232.5 ml (−97.9%, $p < 0.001$) while changes in maximum urine flow (3.0 ml per second or 25%, $p = 0.027$) and I-PSS (−16.5 or −71.7%, $p = 0.003$) were also significant. The most common complications were vesicular neck contracture in 7% of cases and urinary retention in 6.4%.

Conclusions: Office based photovaporization of the prostate can be a safe, effective and well tolerated approach to benign prostatic hyperplasia in office settings using local anesthesia. We believe that it can become an attractive low cost treatment option for the rapidly expanding population at risk for benign prostatic hyperplasia.

Key Words: prostatic hyperplasia; laser therapy; volatilization; ambulatory surgical procedures; anesthesia, local

Abbreviations and Acronyms

BPH = benign prostatic hyperplasia

ED = erectile dysfunction

KTP = potassium titanyl phosphate

OAB = overactive bladder

PSA = prostate specific antigen

PVP = prostate photovaporization

PVR = post-void residual urine volume

Qmax = uroflow

QoL = quality of life

TRUSP = prostate transrectal ultrasound

TURP = transurethral prostate resection

UR = urinary retention

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Laser therapy has become an increasingly popular approach to BPH. One of the latest advances in laser therapy for BPH is the 980 nm diode laser, which is used for PVP.[1] The 980 nm diode laser is absorbed by water and hemoglobin and, thus, it can be used to achieve excellent tissue ablation and hemostasis.[2] Because it limits the absorption of hypotonic fluid,[2,3] the 980 nm diode laser may be particularly useful in patients with the types of pulmonary and cardiovascular disorders that often accompany BPH.[3,4] The fact that laser therapy is well tolerated using local anesthesia[3,5] suggests that it is particularly appropriate for outpatient settings.

We determined the effectiveness and tolerability of PVP using the 980 nm diode laser in men with moderate to severe symptoms of BPH when performed in the physician office using local anesthesia. Separate analysis was performed in men with BPH who had a large (greater than 70 ml) prostate. To our knowledge the effectiveness of this device has not been previously studied in men with a prostate of this size nor are there published results of using this device in the office setting.

Methods and Materials

Included in study were 139 men 50 to 89 years old with moderate to severe symptoms of BPH who underwent PVP in the office of physicians (VG and RDL) affiliated with Michigan Institute of Urology between February 2009 and June 2011. The sole inclusion criterion was bothersome irritative voiding symptoms and the sole exclusion criterion was atonic neurogenic bladder.

Preoperative Procedure

Evaluation. Medical history was obtained, and physical examination, blood chemistry panel including PSA and TRUSP were performed in each patient. Bladder outlet obstruction was evaluated with uroflowmetry to measure Qmax and transabdominal ultrasound to measure PVR. Every patient underwent office cystoscopy before the procedure to rule out bladder pathology.

Patients were asked to indicate symptom severity and the effect of BPH symptoms on QoL by responding to an I-PSS/QoL survey before and after the procedure. Additionally patients were evaluated on a subjective basis by questionnaire to determine satisfaction with outcomes following the procedure. Patients were evaluated before and after the procedure for OAB and ED with ED determined by a IIEF (International Index of Erectile Function) score of less than 16. OAB was determined based on patient self-reported symptoms.

Anesthesia and Preparation. Each patient received Levaquin® (levofloxacin) 500 mg 24 hours before the procedure, which was our practice during the beginning of the study. Currently we give single dose antibiotics within an hour of the procedure according to AUA (American Urological Association) guidelines. Between 30 and 60 minutes before the procedure each patient was instructed to empty the bladder. He was then given 1 of 2 age specific doses of diazepam, that is 10 mg for men 75 years or younger and 5 mg for those older than 75 years, plus 1 tablet of Percocet® (acetaminophen and oxycodone) 10/325 orally.

The patient was prepared for a standard office cystoscopic procedure with safety goggles provided to prevent damage from laser exposure. At 15 minutes before the procedure the bladder was instilled with 50 ml 1% cold lidocaine administered through a 14Fr catheter and the penis was clamped. Urethral block was achieved by administering 10 cc 2% lidocaine gel through the urethra using a Uro-Jet® applicator. Prostatic block was achieved by injecting 1% lidocaine under transrectal ultrasound guidance in the periprostatic and intraprostatic areas. Intraprostatic block was achieved at the base, mid region and apex. A total of 20 cc lidocaine (10 cc per side) were injected.

Operative Procedure

Equipment. All surgical procedures were performed by 2 of us (VG and RDL) using the EVOLVE® 980 nm laser system set at a maximum power of 180 W. (This laser system was recently upgraded to provide a maximum power of 200 W.) We used continuous flow and a 24Fr cystoscope fitted with a 30-degree telescope and a visual obturator. Because various types of fibers were used (twister, side fire and end fire), we ensured the availability of cystoscopes with an internal 7.5Fr channel for the Twister SF™ Fiber or a 7Fr channel for the other fibers. A video system (Stryker®) was set up with a safety filter in place to record each procedure.

Surgery. We began by inserting the cystoscope in the urethra under direct vision. The bladder was irrigated with cool sterile water. We moved the scope forward until its tip was in the bladder and then inserted the laser fiber until it was near the tip of the scope. After preliminary cystoscopic examination of the perivesicular region we opened the fiber.

Beginning at the level of the bladder neck we vaporized tissue from the median lobe, sweeping the fiber slowly and continuously in a gentle rotatory movement in the 5 to 7 o'clock direction while keeping the fiber in direct contact with prostatic tissue. We then looked in the direction of