Influence of High-Power Potassium-Titanyl-Phosphate Photoselective Vaporization of the Prostate on Erectile Function: A Short-Term Follow-Up Study

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ABSTRACT

Introduction. Erectile function after high-power potassium-titanyl-phosphate (KTP) photoselective laser vaporization of the prostate has not been investigated systemically.

Aim. The aim of this study was to evaluate the impact of high-power KTP photoselective laser vaporization of the prostate on erectile function in men with lower urinary tract symptoms (LUTS)/benign prostatic hyperplasia.

Methods. A total of 45 patients with mean age of 68.3 years (range 56–86) were included in the primary analysis. At baseline and at 6-month postoperative visit, the International Index of Erectile Function (IIEF), International Prostate Symptom Score (IPSS), maximum flow rate (Qmax), and post-void residual urine (PVR) volume were evaluated.

Main Outcome Measures. The primary efficacy outcome was changes in the "erectile function" domain and other sexual functions. The secondary outcome was changes in LUTS.

Results. Six months after surgery, data of the IPSS, Qmax, and PVR volume improved ($P < 0.05$). All IIEF domains also improved 6 months after surgery ($P < 0.05$). "Erectile function" domain increased from a baseline of 11.3 ± 1.8 to 14.7 ± 1.7 ($P = 0.015$). Overall, the IIEF total sum increased from a baseline mean of 27.4 ± 3.8 to 34.9 ± 3.7 after KTP photoselective vaporization of the prostate ($P = 0.010$).

Conclusions. The present results suggest that 6 months after high-power KTP laser vaporization, sexual functions including erectile function improved. However, as with any new technique, a longer follow-up and a larger cohort are needed further to validate these findings. **Paick J-S, Um JM, Kim SW, and Ku JH. Influence of high-power potassium-titanyl-phosphate photoselective vaporization of the prostate on erectile function: A short-term follow-up study. J Sex Med 2007;4:1701–1707.**

Key Words. Prostate; Benign Prostatic Hyperplasia; Vaporization; Laser Surgery; Erectile Function

Introduction

Many techniques are now available for the treatment of symptomatic benign prostatic hyperplasia (BPH). The advent of the new, high-powered (80 W) potassium-titanyl-phosphate (KTP) lasers into the field of minimally invasive treatment of BPH has led to renewed interest in laser vaporization [1–3]. High-power KTP has the advantage of rapid tissue vaporization, a low depth of penetration, resulting in less underlying tissue damage, and excellent hemostasis. The 532-nM wavelength is selectively absorbed by hemoglobin and it is transparently delivered through water. It also has a small optical penetration depth, namely less than 0.8 mm in tissue. This shallow tissue penetration characteristic allows the confinement of high-power laser energy to a superficial layer of prostatic tissue, which is vaporized rapidly and hemostatically with only a 1- to 2-mm rim of coagulated tissue [4,5].

Furthermore, although transurethral resection of the prostate (TURP) continues to be the reference standard, KTP laser vaporization has

demonstrated promising early results comparable with those of TURP, and has offered advantages over TURP with regard to intraoperative safety [3,6]. However, to our knowledge, erectile function after high-power KTP photoselective laser vaporization of the prostate has not been previously investigated systemically. In the present study, we determined the impact of high-power KTP photoselective laser vaporization of the prostate on erectile function in men with lower urinary tract symptoms (LUTS)/BPH.

Patients and Methods

Participants

Approval for this study was provided by the Internal Review Board of the Seoul National University Hospital. Clinical records of 57 men with LUTS who underwent KTP laser vaporization of the prostate from December 2005 to June 2006 were retrospectively reviewed. Men who were suffering from LUTS because of BPH and failed previous medical therapy with alpha-blockers were included in this study. Patients with the following values or conditions were excluded from the study: (i) those receiving 5 alpha-reductase inhibitors, (ii) use of an indwelling urinary catheter, (iii) previous prostatic surgery, (iv) urethral stricture, and (v) prostatic malignancy or neurogenic bladder disease. Patients were also excluded from the study if they had penile anatomical disorders impairing erectile function, major medical illness (e.g., uncontrolled diabetes or severe renal, hepatic or cardiovascular diseases), major psychiatric disorders, or a history of alcohol or drug abuse. All patients were in a stable and heterosexual relationship within the 4-week period before completing the questionnaire and during the follow-up period. A total of 45 patients with a mean age of 68.3 years (range 56–86) were included in the primary analysis.

Study Design

All patients were evaluated with urinalysis, maximum flow rate (Qmax) determination, postvoid residual (PVR) urine volume measurement, digital rectal examination (DRE), serum prostate-specific antigen (PSA) determination, and transrectal ultrasonography (TRUS). If the screening criteria were met (elevated PSA or abnormal DRE findings), TRUS-guided prostate biopsy was performed to document the absence of adenocarcinoma of the prostate. All patients had presumed benign disease (normal PSA level and DRE findings or negative transrectal biopsy results).

Measurements of LUTS and Erectile Function

LUTS and symptom-specific quality of life (QOL) were assessed using the International Prostate Symptom Score (IPSS) and the IPSS QOL scores. Baseline sexual function was also evaluated using the self-administered Korean version of the International Index of Erectile Function (IIEF) [7]. The IIEF is a 15-item scale and each item is rated from 0 (or 1) to 5. A response of 1 for a question was considered as the least functional, whereas a response of 5 was considered as the most functional. The IIEF has five domains of sexual function that consist of "erectile function," "sexual drive," "orgasmic function," "intercourse satisfaction," and "overall sexual satisfaction." Possible scores for the "erectile function" domain range from 6 to 30 if men have a sexual activity.

KTP Photoselective Laser Vaporization of the Prostate

KTP laser vaporization of the prostate was performed by a single surgeon (J.S.P.) in a routine manner. Although intravenous sedation was the preferred method of anesthesia, the decision to use spinal or general anesthesia was left to the clinical discretion of the anesthesiologist. An 80-W KTP laser beam produced by a Laserscope Greenlight PV generator (Laserscope, San Jose, CA, USA) was delivered through a side-deflecting fiber with a 23-F continuous-flow cystoscope. Normal saline was used as the irrigant. Prostate vaporization was performed under direct vision using a near-contact technique by holding the laser fiber 1 to 2 mm away from the tissue and vaporizing the lateral lobes beginning at the bladder neck. The laser beam and the tissue to be resected were clearly visible throughout the procedure.

Statistical Analysis

At 6-month postoperative visit, the IIEF, IPSS, Qmax, and PVR volume were recorded. The primary efficacy outcome was changes in the "erectile function" domain and other sexual functions. The secondary outcome was changes in LUTS. Changes in IPSS, Qmax, and PVR were used as secondary efficacy outcomes. The variables were evaluated for statistically significant differences between the preoperative and postoperative values using the paired *t*-test. A 5% level of significance was adopted for all statistical testing, and all statistical tests were two-sided. Statistical analysis was performed using a commercially available