Photoselective Vaporization of the Prostate in Men With Refractory Urinary Retention

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OBJECTIVE To assess the efficacy of photoselective vaporization of the prostate (PVP) and the predictive factors of treatment failure in patients with refractory urinary retention.

MATERIALS AND METHODS From January 2006 to December 2013, we prospectively included all patients treated by PVP preoperatively catheterized for urinary retention. The primary end point was the number of patients free of indwelling catheters 3 months after the procedure. Univariate and multivariate analyses were performed to identify the predictive factors of treatment failure.

RESULTS One hundred fifty-two patients were included in the final analysis. The percentage of patients free of indwelling catheters was 91.5% 3 months after PVP. Two factors were identified as predictive of treatment failure at 3 months in multivariate analysis: a smaller preoperative ultrasonographic prostate volume (UPV; odds ratio [OR] = 0.91; $P = .008$) and a higher volume of primary urinary retention (OR = 1.03; $P = .003$). Forty-two patients (27.6%) required early recatheterization within 7 days after surgery. Smaller UPV was the only predictive factor of treatment failure in the early postoperative in multivariate analysis (OR = 0.97; $P = .01$).

CONCLUSION Nearly one-third of patients treated for refractory urinary retention fail the first trial without catheter after PVP, but 91.5% are free of indwelling catheter 3 months after surgery. A smaller preoperative UPV and a higher retention volume were predictive of PVP failure in patients with preoperative indwelling catheters. UROLOGY 86: 145–150, 2015. © 2015 Elsevier Inc.

Urinary retention is a common complication in men with benign prostatic hyperplasia (BPH). The risk of urinary retention in men aged >60 years is twice than in younger men.[1] Unfortunately, refractory urinary retention (RUR) persists despite first-line drug treatment in some patients, and these patients constitute a large proportion of those requiring surgery for BPH.

Patients catheterized for urinary retention are mostly excluded from studies because of the higher risk of complications and poorer results than other patients.[1,2] Transurethral resection of the prostate (TURP) remains the gold standard for the treatment of patients with urinary retention due to BPH, but laser treatments may be a viable alternative, shortening hospital stays and decreasing the risk of complications in these patients with a high prevalence of comorbid diseases.[2] Photoselective vaporization of the prostate (PVP) with the GreenLight laser (AMS, Minnetonka, MN) has been presented as a surgical alternative to TURP and is one of the new surgical techniques for patients suffering from benign prostate obstruction symptoms. Ruzat et al[3] reported good functional outcomes for PVP in patients with RUR caused by BPH, similar to those obtained for catheter-free patients. However, there are very few data concerning the efficacy of PVP in patients with RUR and predictive factors have never been assessed.

We evaluated the efficacy of PVP with the GreenLight laser by focusing on a hard clinical end point: the number of patients no longer requiring catheterization after postoperative recovery. Our secondary goals were to identify the factors predictive of failed trial without catheter 7 days and 3 months after the procedure.

MATERIALS AND METHODS

Study Population

From January 2006 to December 2013, we prospectively included all consecutive patients with an indwelling catheter for urinary retention due to BPH undergoing PVP and then

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performed a retrospective analysis of these prospectively collected data.

RUR was defined as a failed trial without catheter (ie, an impossibility to void or a postvoid residual urine volume [PVR] >200 mL) after first-line drug treatment including alpha-blockers for at least 48 hours, resulting in recatheterization. During the study period, PVP was carried out in patients with high surgical risks or in those who chose PVP rather than gold-standard procedures. Because we used to consider that patients with RUR had a higher surgical risk, PVP rather than TURP or open prostatectomy was systematically offered to all patients with RUR. Patients with prostate cancer on biopsy, with a follow-up of <3 months, or requiring early (<3 months) repeat surgery (because of clot retention or clusters of necrotic deposits in the prostate), or with neurologic disease were excluded.

Study Design and Data Collection

This was an observational, prospective, single-center study. Before surgery, all patients underwent a standard urologic evaluation, including the minimum preoperative evaluation advocated by the American Urological Association Clinical Guidelines.[4] This evaluation included the following: digital rectal examination, an evaluation of retention volume (RV) at catheterization, the transrectal ultrasonographic measurement of prostate volume (UPV), duration of catheterization before surgery, drug treatments administered before surgery, any intake of anticoagulation or antiplatelet treatments, the usual urinary parameters routinely assessed, such as International Prostate Symptom Score (IPSS). RV at first catheterization was assessed. The surgeon's experience was also recorded and categorized as <20 cases of PVP, between 20 and 50 cases, and >50 cases.

Laboratory investigations included determinations of clinical chemistry parameters and serum prostate-specific antigen (PSA) levels. Patients with suspect results on digital rectal examination or abnormal PSA values not related to prostatic volume underwent prostate biopsy during the operation (n = 38). If biopsy results led to a diagnosis of prostate cancer, the patient was excluded from the study. The study received the approval of the local ethics committee.

Complications were reported using the Clavien-Dindo score[5] recently adapted for PVP by Peyronnet et al.[6] Complications were assessed during the early postoperative phase (at 30 days) and then at each consultation.

Patients lost to follow-up were contacted by telephone and mail, to schedule a new consultation with clinical and ultrasonography evaluation, whenever possible, to maximize the reliability of the results.

Surgical Techniques and Perioperative Management

Patients underwent PVP (GreenLight laser KTP-80W, HPS-120W, or XPS-180W laser; AMS, Minnetonka, MN), with a dedicated 23F continuous-flow endoscope. The procedure was carried out under general or spinal anesthesia, at the discretion of the anesthesiologist. The technique was similar to that described by the International GreenLight Users Group.[7] All interventions were performed by an experienced surgeon or with the supervision of this expert. The following intraoperative data were collected: duration of the procedure and vaporization, energy delivered, and type of fiber. A 2-way Foley catheter was inserted at the end of the procedure. The indwelling catheter was removed after the urine had cleared, generally on the day after the procedure. The only drug routinely used after catheter removal was paracetamol. Antibiotics were only prescribed in case of positive urine culture associated with fever and anticholinergics or nonsteroidal anti-inflammatory drugs only in patients who complain of severe storage symptoms persisting several days after the PVP. The follow-up protocol included visits at 3, 6, and 12 months, with annual visits thereafter, with the recording and comparison of Qmax, UPV, PVR, and IPSS.

Table 1. Patients characteristics

Characteristics	Number of Patients = 152
Age, mean ± SD (y)	77.2 ± 9
ASA score, median (IQR)	3 (1-3)
Antiplatelet intake, n (%)	
Aspirin	44
Clopidogrel	22
Anesthesia, n (%)	
General	43
Spinal anesthesia	56
Medical treatment, n (%)	
Alpha-blockers	64
Bitherapy	16
Plant extracts	2.5
Prostate volume (cm^3), mean ± SD	85.1 ± 43.5
PSA level (ng/dL), mean ± SD	9.9 ± 15.3
Retention volume at catheterization (mL), mean ± SD	1111 ± 860
Derivation, n (%)	
Urethral catheter	92
Suprapubic catheter	8
Duration of catheterization before surgery (d), mean ± SD	98 ± 93.6
Appearance of the bladder on cystoscopy, n (%)	
Normal	18
Trabecular	56
Trabecular and diverticular	26

ASA, American Society of Anesthesiologists; IQR, interquartile range; PSA, prostate-specific antigen; SD, standard deviation.

End Points

The primary end point was the number of men able to void spontaneously 3 months after the PVP. Secondary end points were the rates of patients catheter free at 1, 6, 12, and 24 months; the perioperative parameters; the postoperative complications; and the functional outcomes.

Statistical Analysis

Statistical analyses were performed with JMP version 10.0 software (SAS Institute Inc, Cary, NC). We obtained the following summary statistics: Means and standard deviations were reported for continuous variables and proportions for nominal variables. For all evaluations, values of $P < .05$ were considered significant. For identification of the predictors of failure at 7 days and at 3 months after the procedure, we used the chi-square test and Fisher exact tests for comparisons of discrete variables and Mann-Whitney tests for continuous variables, as appropriate. We included all covariates with a P value of <.25 in univariate analysis and in the multivariate analysis, which was based on binary logistic regression. For continuous variables, odds ratios were expressed as range (per change in regressor over entire range, ie, change for each unit increase).