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DOES POSTOPERATIVE PYURIA INFLUENCE TREATMENT OUTCOMES AFTER PHOTOSELECTIVE VAPORIZATION OF THE PROSTATE (PVP)?: A SHORT-TERM SERIAL FOLLOW-UP STUDY

Hypothesis / aims of study

Benign prostatic hyperplasia (BPH) becomes a problem when patients are accompanied by consequent lower urinary tract symptoms (LUTS), leading to impaired quality of life (QOL), even though it is not life-threatening. Due to significant complications associated with transurethral prostatectomy (TURP), the reference standard for surgical treatment of LUTS/BPH, a variety of minimally invasive surgical treatment modalities have been developed. Photoselective laser vaporization of the prostate (PVP) has gained popularity as a valid alternative of TURP. Recently, it has been suggested that applied laser energy might be beneficial with respect to hemostasis but some patients may suffer postoperative storage symptoms or dysuria [1]. Thus, dysuria or storage symptoms may influence on surgical outcome in the postoperative period after PVP.

The presence of pyuria after BPH surgery is a common finding and may be a possible cause of dysuria or persistent LUTS after the surgery. A minority of studies reported that the postoperative pyuria could persist during 1- to 3-months after TURP [2,3]. Therefore, the presence of postoperative pyuria may affect surgical outcomes in the early postoperative period after the PVP. To date, however, there have been very rare data on serial changes in the incidence of postoperative pyuria after the PVP and on whether the presence of postoperative pyuria can have an impact on surgical outcomes in the short-term period after the PVP. The aim of this study was to identify serial changes in the incidence of postoperative pyuria after the PVP, to determine whether the presence of postoperative pyuria could be correlated with surgical outcomes after surgery and to identify predicting factors that influence on persistent pyuria after the PVP.

Study design, materials and methods

Between September 2009 and September 2013, a total of 102 eligible men who underwent PVP using 80W KTP laser (n = 90) or 120W HPS laser (n = 12) for LUTS/BPH refractory to medical treatment were included in this prospective study. The inclusion criteria were as follows: (1) sterile urine on urinalysis and urine culture before surgery, (2) absence of indwelling urethral catheter. Patients were excluded if they had a previous diagnosis of prostate carcinoma or urinary stone and if they received any antibiotic treatment within 2-weeks before surgery. All patients were assessed at baseline with history, physical examination including digital rectal examination, International Prostate Symptom Score (IPSS), Overactive Bladder Symptom Score (OABSS), urinalysis, urine culture, serum creatinine (Cr), serum prostate-specific antigen (PSA), transrectal ultrasonography (TRUS) and urodynamic study. All eligible patients underwent PVP in a routine manner and received a short-course administration of prophylactic antibiotics (an initial intravenous administration of 1 g cefotiam 30 minutes to 1 hour before surgery, followed by two intravenous administration of cefotiam for 24 hours after surgery. Surgical outcomes were evaluated at 1-week, and 1-, 3-, 6- and 12-months postoperatively using the IPSS, OABSS, uroflowmetry with post-void residual urine volume (PVR), urinalysis and urine culture. Follow-up serum PSA levels were checked at 3-months postoperatively. The pyuria was defined as the presence of greater than 5 white blood cells (WBC) per high power field (HPF) of microscopic analysis on voided mid-stream urine, according to the institution's laboratory threshold. Bladder voiding efficiency (BVE) was defined as a percentage: BVE = (voided volume)/(voided volume + PVR) × 100.

Results

Mean (± standard deviation) preoperative total prostate volumes and mean (± standard deviation) serum PSA level were 52.3 (± 16.1) g and 3.9 (± 2.8) ng/ml, respectively. The percentage of patients with detrusor overactivity and mean amount of energy applied during the PVP were 11.8% and 173.4 kJ, respectively. Maximum flow rate, PVR and BVE significantly improved compared to the baseline beginning 1-week after surgery. Total IPSS, subtotal voiding symptoms score and quality-of-life (QOL) index were significantly decreased compared with the baseline beginning 1-week after surgery, while subtotal storage symptoms score and total score of OABSS were significantly decreased beginning 3-months after surgery. The incidences of postoperative pyuria were 100.0%, 51.0%, 19.6% and 0.0% at 1-week, and 1-, 3- and 6-months after the PVP, respectively, indicating the tendency to decrease with time. There was only one case with bacteriuria (positive urine culture: a growth of a single uropathogenic bacteria greater than or equal to 10^5 colony forming units (cfu)/ml) through the entire follow-up period. The bacterium isolated on urine culture was Klebsiella pneumoniae at 1-week after surgery. Mean reduction of serum PSA at 3-months after the PVP was 70.5%. The incidences of dysuria at 1-week, 1-month and 3-months after the PVP were 30.3%, 25.4% and 5.9%, respectively. The decreases of subtotal storage symptoms score and total OABSS in the patients without postoperative pyuria at 1-month after surgery were significantly greater than in those with pyuria at 1-month postoperatively. At 3-months after surgery, the patients with postoperative pyuria showed the greater improvement in subtotal storage symptoms score, total OABSS, QOL index, BVE and PVR compared with those without postoperative pyuria. On logistic regression analysis to identify the predictors that influence persistent pyuria at 3-months after the PVP, univariate analysis showed that preoperative older age, higher baseline serum PSA, larger baseline prostate size, lower baseline BVE, higher baseline total IPSS, higher baseline total OABSS, smaller bladder volume at the first desire to void and greater amount of energy utilized were significantly associated with persistent pyuria. On multivariate analysis, age, serum PSA, prostate size and the amount of energy utilized were the independent predictors of persistent pyuria at 3-months after surgery.

Interpretation of results

Postoperative pyuria is a relatively common finding in the early postoperative period after transurethral BPH surgery and some patients complain of persistent LUTS including storage symptoms after the PVP. Thus, we hypothesized that presence of postoperative pyuria could affect the surgical outcome in the short-term postoperative period after the PVP. Thus, the objectives

of this study were to determine the natural history of postoperative pyuria after the PVP, to assess whether the presence of postoperative pyuria could have an impact on surgical outcomes of PVP, and to identify predictors that influence on persistent pyuria.

In the present study, postoperative pyuria showed the tendency to decrease with time through the entire follow-up period although it is very common immediately after the PVP. Also, the presence of pyuria had an adverse impact on the subjective surgical outcome for storage symptoms at 1-month after the PVP. At 3-months after surgery, persistent pyuria adversely affected both the subjective and objective treatment outcomes.

This study showed that preoperative older age, higher serum PSA, larger prostate size and the greater amount of energy utilized were the independent predictors of persistent pyuria at 3-months after the PVP.

Concluding message

The postoperative pyuria can be observed in nearly all patients immediately after the PVP, but its incidence decreases with time throughout follow-up period. However, the postoperative pyuria may have an adverse effect on treatment outcomes in the early postoperative period after the PVP. Also, our data suggest that preoperative older age, higher serum PSA, larger prostate size and the greater amount of energy utilized may be the predicting factors of persistent pyuria at 3-months after the PVP. Further studies with a larger cohort are necessary to confirm these findings.

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Disclosures

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