

Plasmakinetic vaporization versus transurethral resection of the prostate: Six-year results

Plazmakinetik vaporizasyon ile transüretral prostat rezeksiyonu karşılaştırması; 6 yıllık sonuçlar

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ABSTRACT

Objective: Benign prostate hyperplasia (BPH) is becoming more prevalent in parallel to the changing demographic structures of the community. Transurethral resection is still considered the most effective treatment. Due to advances in technology, different treatment modalities are being attempted. In our study, we compared the long-term results of standard transurethral resection of prostate (TURP) with plasmakinetic vaporization of prostate (PKVP, Gyrus Medical Ltd., Bucks, UK).

Material and methods: Of the 75 patients who were admitted to our outpatient clinic between 2001 and 2003 with lower urinary tract complaints and who were randomized into two groups (transurethral resection (TUR) and PKVP), 36 were enrolled to study and completed a follow-up period of 72 months.

Results: Both groups were equal in terms of age and preoperative parameters. The preoperative maximum uroflow rate (Qmax) in the PKVP group was 6 (2.3) mL/s and the rates were 21.8 (3.4) and 20.1 (3.1) during the control visits at 36 and 72 months, respectively. For the PKVP group, these rates were 6 (3.1), 14.4 (2.6), and 15.6 (2.8), respectively. In terms of the international prostate symptom score (IPSS), for the TUR group, these values were 22 (3.8), 5.7 (1.2), and 7.9 (2.6). For the PKVP group, the respective values were 21 (3.4), 7.6 (1.4), and 11 (2.4). The IPSS and Qmax values measured at the 36th and 72nd months for both groups were significantly different from each other (p<0.05).

Conclusion: Compared to standard TURP, PKVP was found to be unsuccessful in the treatment of BPH when long-term outcomes were considered.

Key words: Benign prostatic hyperplasia; bipolar plasma kinetic vaporization; transurethral prostatectomy.

ÖZET

Amaç: Benign prostatik hiperplazi, toplumun değişen demografik yapısına paralel olarak gittikçe daha sık karşılaşılan bir durum olmaktadır. Transüretral rezeksiyon halen en etkin tedavi yöntemi olarak kabul edilmekte, ancak teknolojik gelişmelere paralel olarak farklı tedavi modaliteleri denenmektedir. Çalışmamızda standart transüretral rezeksiyon (TUR) ile plazmakinetik vaporizasyon PKVP'nin (Gyrus Medical Ltd., Bucks, UK) uzun dönem sonuçları karşılaştırıldı.

Gereç ve yöntemler: 2001-2003 tarihleri arasında, alt üriner sistem yakınmaları ile polikliniğimize başvuran semptomatik iki gruba (TUR ve PKVP) randomize edilen 75 hastadan 72 aylık takibi tamamlayan 36 hasta çalışmaya alındı.

Bulgular: Her iki grup yaş ve preoperatif parametreler açısından homojendi. PKVP grubunun preoperatif Qmax değeri 6 (2,3) mL/s iken 36. ve 72. aydaki kontrollerinde sırası ile 21,8 (3,4) ve 20,1 (3,1) olarak tespit edildi. Bu oranlar PKVP grubunda sırası ile 6 (3,1), 14,4 (2,6) ve 15,6 (2,8) olarak ölçüldü. IPSS'ler açısından bakıldığında TUR grubunda bu değerler sırası ile 22 (3,8), 5,7 (1,2) ve 7,9 (2,6) olarak değerlendirilirken, PKVP grubunda 21 (3,4), 7,6 (1,4) ve 11 (2,4) olarak ölçüldü. Her iki grubun postoperatif Qmax ve IPSS'leri preoperatif değerlerinden anlamlı olarak farklı idi. Her iki grubun 36 ve 72. aylarda ölçülen IPSS ve Qmax değerleri anlamlı olarak birbirlerinden farklı idi (p<0,05). PKVP yapılan grupta 6 hasta İAB nedeni ile reopere edilirken 6 olguya a-blokör başlandı. TUR-P yapılan grupta ise 2 olgu reopere edilirken 1 olguya a-blokör başlandı (p<0,05). Her iki grupta birer olguda üretra darlığı tespit edildi. İşlem sonrası gelişen komplikasyonlardan ED PKVP grubunda 5, TUR-P grubunda 3 iken retrograd ejakulasyon sırası ile 13 ve 8 olarak gözlemlendi (p>0,05).

Sonuç: Uzun dönem sonuçlar göz önüne alındığında BPH tedavisi için PKVP, standart TUR'a göre başarısız bulunmuştur.

Anahtar kelimeler: Benign prostat hiperplazisi; bipolar plazmakinetik vaporizasyon; transüretral prostatektomi.

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Introduction

Benign prostate hyperplasia (BPH) is frequently seen in advanced age males and is a progressive disease. BPH is a disease that negatively affects the quality of life, rather than a life-threatening disease. The number of medical and surgical treatment choices for BPH has been increasing. Despite the fact that mortality and morbidity due to transurethral resection of prostate (TURP) decreased in recent years, postoperative morbidity is still approximately 20%.^[1]

In parallel to advances in science and technology, it is important to seek alternative treatments with less morbidity and similar effectiveness to TURP (which is the gold standard endoscopic surgical treatment) and to develop minimally invasive methods.^[2,3] Plasmakinetic energy possesses some of these properties. Bipolar energy enables us to get rid of classical TUR syndrome with the possibility of avoiding the use of non-physiological washing solutions.^[4]

The assessment of long-term outcomes of plasmakinetic vaporization of prostate (PKVP), a minimally invasive procedure possessing lower morbidity in the early postoperative period, is a medical necessity. For this purpose, we compared the long-term outcomes of TURP and PKVP (Gyrus Medical Ltd., Bucks, UK) in our study.

Material and methods

Seventy-five patients who were admitted to our outpatient clinic between 2001 and 2003 with lower urinary tract complaints were randomized into two groups (TURP and PKVP). Thirty-six patients were enrolled to our study and completed a follow up period of 72 months: 22 were in the PKVP group and 14 received the TURP operation. Approval from the local ethics committee (Haydarpaşa Numune Training and Research Hospital Ethical Committee) and informed consents were obtained.

The international prostate symptom score (IPSS) and international index of erectile function (IIEF) questionnaires were completed by the patients after a physical examination. Serum Prostate Specific Antigen (PSA) values were measured. Prostate volumes were measured with ultrasonography (USG), and uroflowmetric assessments were performed.

Cases with Qmax of <15, IPSS of ≥ 20 , and prostate volume (PV) of <60 were enrolled to the study. Cases with PSA >4 or those with abnormal rectal digital examination were included to study after ruling out cancer with a prostate biopsy. The appropriate treatments were given to patients with urinary tract infections before procedure.

All patients were operated by the same surgeon. Patients in the TUR group were operated with Storz (26 F) resectoscope, under continuous glycine irrigation. Patients in the PKVP group were operated with plasmakinetic energy (Gyrus Medical Ltd., Bucks, UK), with an electrode called a plasma v, by using bipolar energy under continuous isotonic irrigation.

Continuous isotonic irrigation was applied to all cases by inserting a 22 F 3-way Foley catheter. The Foley catheters were removed upon discharge.

Statistical analysis

Mann-Whitney and Wilcoxon Tests were used for statistical evaluation. $P < 0.05$ accepted as statistically significant.

Results

Mean age of the TUR-P group was 66.1 ± 21.2 , and PV was 51.2 ± 9.8 , and the respective values for the PKVP group were 67.2 ± 19.8 and 50.1 ± 8.8 . Both groups had similar baseline characteristics. The preoperative maximum uroflow rate (Qmax) value of the TUR group was 6 (2.3) mL/s; while during the control visits at 36 and 72 months, the values were 21.8 (3.4) and 20.1 (3.1), respectively. For the PKVP group, these rates were 6 (3.1), 14.4 (2.6), and 15.6 (2.8) at baseline, 36 and 72 months, respectively. In terms of IPSS, for the TURP group, these values were 22 (3.8), 5.7 (1.2), and 7.9 (2.6). For the PKVP group, the respective values were 21 (3.4), 7.6 (1.4), and 11 (2.4). Each group's postoperative Qmax and IPSS values were significantly different than the preoperative values. The IPSS and Qmax values measured at 36 and 72 months in both groups were significantly different from each other ($p < 0.05$) (Table 1).

Of the group that underwent PKVP, 6 patients were operated due to lower urinary tract symptoms (LUTS), while alpha-blockers were started in the other 6 cases. Two cases were reoperated, and alpha-blocker was started in 1 case in the TURP group ($p < 0.05$). Urethral stricture was detected in one case from each group. Patients were treated with direct-vision, internal urethrotomy. The number of patients with erectile dysfunction (ED), which is a complication of the procedure, was 5 in the PKVP group and 3 in the TUR-p group; while number of retrograde ejaculation was 13 and 8 in the respective groups ($p > 0.05$).

Discussion

Benign prostate hyperplasia (BPH) is becoming a more prevalent condition in parallel to the changing demographic structure of our community. It negatively affects quality of life by causing bladder outlet obstruction. TURP is considered to be the gold standard endoscopic treatment in the treatment of BPH, which causes bladder outlet obstruction.^[5] Despite a decrease in the

Table 1. Comparison of each group

		Baseline	36 th month	72 nd month
TUR-P n:22	IPSS	22±3.8	5.7±1.2	7.9±2.6
	Qmax	6±2.3	21.8±3.4	20.1±3.1
	Reoperation/alpha blocker		2/1	
PKVP n:14	IPSS	21±3.4	7.6±1.4	11±2.4
	Qmax	6±3.1	14.4±2.6	15.6±2.8
	Reoperation/alpha blocker		6/6	
P		p>0.05	p _{IPSS} =0.010 p _{Q_{max}} =0.018 P _{Reoperation/alpha blocker} =0.001	
IPSS: international prostate symptom score; PKVP: plasmakinetic vaporization of prostate; TURP: transurethral resection of prostate; Qmax: maximum uroflow rate				

surgical treatment of BPH together with an increase in medical treatment choices, TURP is still the second most common operation performed in elderly males.^[6]

Transurethral resection of the prostate, transurethral incision of the prostate, and open prostatectomy are conventional surgical choices. TURP accounts for 95% of all surgical methods and is the treatment of choice for prostates sized 30-80 mL. Preoperative and postoperative complications are associated with the prostate size and length of procedure.^[6] In a meta-analysis including 29 trials, a 71% (66-76) decrease in LUTS, 115% (80-150) increase in Qmax (+9.7 mL/s), and 60% decrease in post-void residual urine volume were observed.^[7] First year outcomes in the TURP group in our study were similar to those previously published.^[8] These successful results were sustained in a 6-year follow-up.

Mortality rates arising from TURP are less than 0.25% in recent studies.^[7,9] The risk of TUR syndrome is approximately 2%, and the prolonged operative time and excessive bleeding due to an opening of the venous sinus can be counted as risk factors.^[10] No reported TUR syndrome was detected in our study. Blood transfusions are required after TURP in approximately 2-5%.^[7] In terms of long-term complications, incontinence, urethral narrowing, and bladder neck obstruction were reported to be 2.2%, 3.8%, 4%, respectively.^[7] The observed rate of retrograde ejaculation is 65-70% and ED is 6.6%. Repeated prostate operation rate is 1-2%.^[7] Similar complication rates were observed in the TURP group in our study. ED was observed at 1 year after surgery in half of the patients. In these cases, ED may occur regardless of surgery.

Sources that generate bipolar energy using radiofrequency waves (Gyrus plasmakinetic system) were used in the transure-

thral resection of the prostate and bladder tumors.^[11,12] The use of normal saline as an irrigation fluid combined with bipolar energy may cause hyponatremia, but there is no risk of TUR syndrome.^[13] In the study performed by Gupta and his colleagues, PKVP in prostates more than 70 gr was found to be successful in terms of one-year results and early postoperative complication rates.^[14] Results of our study showed success in terms of short-term outcomes that is in agreement with other reports in the literature. Low complication rates are also noteworthy.

Transurethral resection of prostate and PKVP were compared in a study performed by Atalay and colleagues, and in the short-term, PKVP was found to be as effective as TURP in decreasing IPSS and increasing Qmax in patients with BPH.^[15] Decreased operation time and short duration of urinary catheterization in PKVP reduced the risk of adverse events. Likewise, Dunsmuir and colleagues compared TURP and PKVP in the treatment of BPH and found similar results at one year.^[11] There were no statistically significant differences between both groups in terms of first-year outcomes in our study. Again, lower complication rates were detected in the PKVP group.^[8] This success in the PKVP group decreased with time, and reoperation and use of alpha-blockers reached an extremely high percentage of 85.7% at the sixth year. This rate calls into question the long-term efficacy of PKVP, which is a micro-invasive surgical method.

Limitations of our study include the fact that it is only a single-center study and the large number of discontinued patients.

The short-term success rates of prostate treatment with PKVP are similar to TURP in our study, similar to other studies. Although PKVP is more advantageous in terms of early postoperative complications, TURP was found to be more successful in the treatment of BPH, should long-term outcomes be taken into account. We think that the high rate of reoperation and use of alpha-blockers in patients treated with PKVP should be kept in mind.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Haydarpaşa Numune Training and Research Hospital.

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