

ARAŞTIRMA MAKALESİ

Surgical Treatment of Large Prostates: Comparison of TUR-p and Open Prostatectomy

Büyük Prostatların Cerrahi Tedavisi: TUR-p ve Açık Prostatektominin Karşılaştırılması

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Abstract: Objective: The challenge begins when the prostate is large, but in the grey zone. European Urology Guidelines suggest using transurethral prostate resection (TURp) for large prostates smaller than 80 ml and the use of open prostatectomy (OP) for those larger than 80-100 ml. In this study, we aimed to compare the safety and efficacy of bipolar TURp and OP treatment options to treat large (80-100 ml) prostates.

Material and Method: Patients applied to our clinic with lower urinary tract symptoms (LUTS) and treated with Open Prostatectomy (OP) (Group 1) and Bipolar Plasma Kinetic TURp (Group 2) were included in the study. Patient age, (total and free) prostate-specific antigen (PSA), prostate volume, symptom scores (pre and postoperative) (IPSS), digital rectal examination, prostate volume, uroflowmetry, operative time, post voiding residual volume (PVR), preoperative and postoperative hematocrit and complications were assessed.

Results: When groups were compared, mean patient age, prostate volume, PSA levels, preoperative hematocrit levels, IPSS, Qmax, and PVR were similar. After the operations, the difference of IPSS, Qmax, and PVR were significantly better, favoring Group 1 ($p=0.000$, $p=0.000$ and 0.05 , respectively). However, hospital stay and hematocrit drop were significantly better in favor of Group 2 ($p=0.000$ and $p=0.018$).

Conclusion: Even though there are many alternatives for OP and it is considered to be out of fashion, in developing countries, OP may be more suitable than TURp in treating large prostatic glands. Prospective randomized studies on larger cohorts should be performed to validate our findings.

Keywords: Prostate, TURp, open prostatectomy, Plasma Kinetic, Bipolar, Large Prostate

Öz: Amaç: Zorluk; prostat büyük olduğunda gri bölgede başlar. Avrupa Üroloji Kılavuzları, 80 ml'den küçük prostatlar için transüretal prostat rezeksiyonu (TURp) ve 80-100 ml'den büyük olanlar için açık prostatektomi (OP) operasyonunu önermektedir. Bu çalışmada, büyük (80-100 ml) prostatların tedavisinde bipolar TURp ve OP tedavi seçeneklerinin güvenilirliğini ve etkinliğini karşılaştırmayı amaçladık.

Gereç ve Yöntem: Alt üriner sistem semptomları (AÜSS) ile kliniğimize başvuran ve Açık Prostatektomi (OP) (Grup 1) ve Bipolar Plasma Kinetik TURp (Grup 2) ile tedavi edilen hastalar çalışmaya dahil edildi. Hasta yaşı, (toplam ve serbest) prostat spesifik antijen (PSA), prostat hacmi, semptom skorları (ameliyat öncesi ve sonrası) (IPSS), dijital rektal muayene, prostat hacmi, üroflowmetri, ameliyat süresi, işeme sonrası rezidüel hacim (PVR), ameliyat öncesi ve sonrası hematokrit ve komplikasyonlar değerlendirildi.

Bulgular: Gruplar karşılaştırıldığında ortalama hasta yaşı, prostat hacmi, PSA düzeyleri preoperatif hematokrit düzeyleri, IPSS, Qmax ve PVR benzerdi. Operasyonlardan sonra IPSS, Qmax ve PVR farkı Grup 1 lehine anlamlı derecede daha iyi idi (sırasıyla $p = 0.000$, $p = 0.000$ ve 0.05). Ancak hastanede yatış ve hematokrit düşmesi Grup 2 lehine anlamlı olarak daha iyi idi ($p = 0.000$ ve $p = 0.018$).

Sonuç: OP için birçok alternatif olmasına rağmen ve modası geçmiş olduğu düşünülse de gelişmekte olan ülkelerde OP, büyük prostat bezlerinin tedavisinde TURp'den daha uygun olabilir. Bulgularımızı doğrulamak için daha büyük kohortlar üzerinde prospektif randomize çalışmalar yapılmalıdır.

Anahtar Kelimeler: Prostat, TURp, Açık Prostatektomi

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Ethical Declaration

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1. INTRODUCTION

Surgical treatment for benign prostatic obstruction (BPO) is well established. According to the size of the prostate, monopolar or bipolar transurethral prostate resection (TURp), open transvesical prostatectomy (OP), or Holmium laser prostate enucleation (HoLEP) are the defined options for treatment (1).

European Urology Guidelines suggest using TURp for large prostates smaller than 80 ml and the use of OP for those larger than 80-100 ml (1). However, several studies suggest the use of TURp when dealing with prostates over 80, or even 100 ml (2,3). However, no standard treatment option is recommended for prostate sizes between 80 and 100 ml.

Even though OP may not be an option in developed countries, technological advancements are unachievable to most patients in many others. Most articles recommend new technology, but for many centers, this new technology is out of reach. Because of this fact, we would like to present this old-fashion research comparing TURp and OP.

In this study, we aimed to compare the safety and efficacy of bipolar TURp and OP treatment options to treat large (80-100 ml) prostates.

2. PATIENT AND METHODS

The study retrospectively included patients presented at our clinic with lower urinary tract symptoms (LUTS) and were treated with bipolar (Plasma Kinetic, Karl Storz, Tuttlingen, Germany) TURp and OP. Both procedures were performed by one highly experienced surgeon each. Patients treated with OP (n: 113) were in Group 1, and those treated with TURp (n: 112) were in Group 2.

Patient age, (total and free) prostate-specific antigen (PSA), symptom scores (pre and postoperative), prostate volume, uroflowmetry, preoperative and postoperative hematocrit, and complications were assessed. Matching parameters were patient age, PSA, prostate volume, IPSS, and uroflowmetry.

All enrolled patients had IPSS greater than 19, Qmax less than 10 ml/s, age >50 years, the prostate volume between 80 and 100 ml, PSA less than 4 mg/dl, and medical therapy failure (both alpha-adrenoceptor antagonist and 5-alpha reductase inhibitor usage for at least six months).

The primary outcome measures were IPSS and Qmax for success in six months.

Patients with neurogenic lower urinary tract disorders, bladder tumor, urethral stricture, history of a previous lower urinary tract operation, PSA>10 mg/dl, an

abnormal digital rectal examination, or prostate biopsy three months before surgery were excluded from the surgery.

All patients were re-evaluated six months after surgery.

2.1. Surgical Procedures

Transvesical Prostatectomy: After a routine diagnostic cystoscopy, the bladder was filled with saline. A lower abdominal vertical incision was made. Rectus muscles were separated at linea alba and the peritoneum was removed, freeing the bladder. Then a midline incision was made to the bladder. A bladder neck incision was made and a digital enucleation was performed to the prostate lobes. For hemostasis, interrupted sutures to 5 and 7 o'clock positions were placed. No cystostomy tubes were placed.

Transurethral Prostate Resection: The classic surgical steps of TURp were performed according to the established principles previously explained (4,5). Cutting power of 160 W and coagulating power of 80 W were used as settings.

A 22 F prostatectomy catheter was placed in the urethra. Continuous bladder irrigation was applied until the drainage became clear. The urethral catheter was removed three days following TURp and seven days following open surgery.

2.2. Statistical Analysis

Statistical analyses were performed using the Statistical Package for Social Sciences version 20.0 software (SPSS Inc., Chicago, Illinois, USA). In addition to the frequency and percentage distributions of the data, Student's t-test was used in the group comparisons, and Pearson's Chi-Square and Fisher's Exact Test were used for comparisons of variables between categorical data. A value of $p < 0.05$ was considered statistically significant.

Ethical Declaration

Ethical approval was obtained from Adana City Training and Research Hospital Ethical Committee with date 22.08.2013 and number 51. Helsinki Declaration rules were followed to conduct this study.

3. RESULTS

No statistically significant difference was present in patient age, prostate volume, total and free PSA, preoperative hematocrit levels, preoperative IPSS, preoperative Qmax, and preoperative PVR. Hematocrit drop, the difference of IPSS, Qmax rise, and hospital stay were significantly different among groups. The comparisons between the groups are summarized in Table 1, and the in-group comparisons are summarized in Table 2.

Table 1: Group comparisons.

	Group 1 (n=113)	Group 2 (n=112)	p
Age (Years)	70.25 ± 5.55	70.42 ± 5.54	p=0.814
Prostate Volume (ml)	94.52 ± 9.76	93.89 ± 9.48	p=0.619
Total PSA (mg/dl)	6.65 ± 1.90	6.17 ± 2.53	p=0.078
Free PSA (mg/dl)	1.50 ± 0.33	1.56 ± 0.29	p=0.314
Preoperative Hematocrit Level	44.79 ± 6.14	45.72 ± 5.66	p=0.233
Hematocrit Drop	9.23 ± 4.22	7.92 ± 4.06	p=0.018
Preoperative IPSS	28.73 ± 3.16	28.95 ± 3.10	p=0.610
Difference of IPSS	19.85 ± 4.10	15.74 ± 4.34	p=0.000
Preoperative Qmax (ml/s)	7.27 ± 2.30	7.71 ± 2.09	p=0.137
Qmax rise	10.81 ± 3.05	9.08 ± 3.35	p=0.000
Preoperative PVR (ml)	84 ± 20.45	83.64 ± 20.59	p=0.786
PVR drop	65.71 ± 21.24	60.39 ± 19.25	p=0.050
Hospital stay	5.20 ± 0.98	2.46 ± 0.65	p=0.000

Complication rates were similar between the groups. In Group 1, 8 patients had mild fever, 11 patients required blood transfusion (8 patients received 1 unit and 3 patients, 2 units), and 9 patients had urinary tract infections treated with oral ciprofloxacin. In Group 2, 9 patients had fever, 8 patients had blood transfusions (5 patients

received 1 unit and 3 patients, 2 units), and 8 patients had urinary tract infections, 2 of whom had to be treated by intravenous antibiotics and thus required prolonged hospitalization. One patient in Group 2 suffered from TUR syndrome because of hypervolemia and was treated with diuretic infusions combined with intravenous NaCl infusions.

Table 2: Comparisons of preoperative and postoperative data among groups.

Group 1 (n=113)	Preoperative	Post-operative	p
Hematocrit	44.79 ± 6.14	35.56 ± 5.83	p=0.000
IPSS	28.73 ± 3.16	8.88 ± 2.57	p=0.000
Qmax (ml/s)	7.27 ± 2.30	18.08 ± 2.12	p=0.000
PVR (ml)	84 ± 20.45	18.67 ± 6.48	p=0.000
Group 2 (n=112)	Preoperative	Post-operative	p
Hematocrit	45.72 ± 5.66	37.80 ± 6.52	p=0.000
IPSS	28.95 ± 3.10	13.21 ± 2.95	p=0.000
Qmax (ml/s)	7.71 ± 2.09	16.84 ± 2.51	p=0.000
PVR (ml)	83.64 ± 20.59	23.25 ± 9.99	p=0.000

IPSS: International prostate symptom score

PVR: Post voiding residual volume

4. DISCUSSION

The gold standard treatment for BPO is considered to be TURp. However, when the glands are large, longer resection time is shown to be associated with higher blood loss and TUR syndrome (6). The results of this study reveal that when larger prostate glands are treated, OP may be comparable to TURp in many ways. Higher levels of improvement were seen in respect of postoperative uroflowmetry, IPSS and PVR in Group 1, although hospital stay was longer and hematocrit drop was higher.

When BPH is treated surgically, TURp is considered to be the gold standard treatment, for glands <80 ml (1). Some researchers have proposed the use of TURp for larger glands and have reported high success rates and even propose as the first line therapy for larger glands (3,7). However, when compared to open surgery or new enucleation techniques, TURp is reported to yield a higher complication rate (8,9).

There are many studies substituting minimally invasive therapies for OP (10). Holmium laser enucleation, electrosurgical enucleation, and thallium laser enucleation are alternative minimal invasive enucleation techniques. However, these require advanced technology, financial expenditure and operator experience (10,11). In developing countries, such equipment may not always be available because of the financial cost. In this study, we have tried to show the success and safety of OP and propose the procedure as an option where there is no access to high technology equipment. Transurethral enucleation of the prostate (TUEP) is an established method that has been proven to have similar outcomes to OP. Ou et al compared OP with TUEP and similar outcomes and complication rates were determined between the groups (12).

Zhu et al found similar advantages of prostatic enucleation over TUR. IPSS, Qmax and PVR were found to be similar but in the long-term, better outcomes were reported in the enucleation group (8). In the current study, better outcomes were determined in the OP group at 6 months. The larger prostates in this cohort are thought to be the reason for this difference.

There are disadvantages of OP. Longer hospital stay and higher blood loss are two significant drawbacks, which were encountered in our study. When all operative outcomes are in favor of OP, these factors should always be kept in mind. Although these disadvantages do not occur with TURp, TUR syndrome is a highly significant complication (13). In the current study, only 1 patient suffered from TUR syndrome and was successfully treated with intravenous 0.9% NaCl. No other major

complications were encountered. Long-term complications, such as urethral stricture and bladder neck contracture could not be assessed due to short follow-up duration.

Minimal invasive therapy seems to entail a shorter hospital stay. Ou et al reported a shorter hospital stay for a TUEP group compared to OP (12) and in a study by Zhu et al, hospital stay was determined as shorter in both groups (TURp and TUEP) than that of the current study cohort (8). The hospital stay duration for TURp and OP in the current study are comparable to lengths of stay proposed by various authors (14–16). Despite the longer hospital stay of OP compared to minimal invasive therapies, it is a viable option for a selected cohort in centers without advanced equipment.

The limitations of this study are firstly, the retrospective method and the short follow-up duration. Six months is not long enough to determine the long-term results of these procedures. New series recommend at least 12 months follow up (17). Also, the bias of surgeon and patient preference are confounding factors. The outcomes now favor one procedure but over time, this slight difference may fade. The study may also be of limited interest because of the usage of newly developed laser vaporization technology, as in developing countries, most centers do not have the benefit of high technology. In addition to that, TURp can be trained better for developing countries, as a viable option for OP as mentioned in this study.

5. CONCLUSION

OP may yield better outcomes in some parameters than TURp in the treatment of large prostatic glands. Even though there are many alternatives for OP and it is out of fashion, in developing countries, OP may be more suitable than TURp for large prostatic glands. Further prospective randomized studies on larger cohorts are required to validate our findings.

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