International Surgery Journal
Mamdoh H et al. Int Surg J. 2021 Mar;8(3):780-783
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20210514

Original Research Article

Bipolar transurethral resection of large prostate >100 gm: single center experience

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Received: 22 January 2021
Revised: 05 February 2021
Accepted: 06 February 2021

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ABSTRACT

Background: Benign prostatic hyperplasia (BPH) is a common urological finding in aged men. It may be associated with deterioration of the patient's quality of life as it may cause lower urinary tract symptoms (LUTS), urinary retention, and deterioration of the renal function. The gold standard treatment option is transurethral resection of prostate (TURP) in patients with prostate up to 80g in size. However, in larger prostates (>80 g), laser or bipolar enucleation of the prostate is considered the treatment of choice. In this setting, we decided to report a single center experience with bipolar TURP for large prostates (>100 g).
Methods: The database of our center was retrospectively reviewed to identify all the patients undergoing bipolar TURP for large prostates (>100 g) between January 2018 and January 2019. The following data was collected, age, prostate size in grams, urinalysis and culture. Moreover, the operative time, resected tissue weight, complications, hospitalization, and catheterization times were also collected Furthermore, urinary tract ultrasound (including the assessment of post voiding residual urine [PVR]), uroflowmetry (including the peak urinary flow [Qmax]), and IPSS were assessed preoperatively, at one, and 12 months postoperatively.
Results: Eight were retrieved from the database and were included in the current study. The median prostate size was 115 grams. All cases were completed by B-TURP without the need for conversion to open prostatectomy and the operative time ranged from 65 to 90 minutes. All the patients showed significant improvement of the IPSS, Qmax, and PVR at one and 12 months follow up. Only three patients in the current series (37.5%) suffered from complications.
Conclusions: B-TURP can be used safely for the management of large prostates (>100 g); however, further studies are required to confirm these results.

Keywords: TURP, Benign prostatic enlargement, Bipolar energy

INTRODUCTION

Benign prostatic hyperplasia (BPH) is among the most common urological findings in aging men. It affects the lives of millions of men as it may be associated with debilitating lower urinary tract symptoms (LUTS). Furthermore, BPH may progress to cause worsening of LUTS, which may eventually end in the urinary retention and/or renal insufficiency.[1] Management of BPH range from reassurance and watchful waiting, medical treatment, to surgical removal of the prostate. Generally, surgical management of BPH progressed overtime from open surgical removal of the prostatic tissue to the endoscopic removal of the prostatic tissue, which represent the current gold standard for BPH treatment.[2] Endoscopic surgery for BPH include the removal of the obstructive prostatic tissues through resection, vaporization, ablation, or enucleation with morcellation.

The most recent European association of urology guidelines on BPH recommends monopolar TURP as the current gold standard for the management of patients with prostates between 30-80 g.[3] Despite the effectiveness and the durable results of M-TURP overtime, its safety profile is still a matter of debate. Post-operative hemorrhage, blood clot retention, urinary tract infection, and urethral stricture are among the most common complications of M-TURP.[4] Furthermore, the hyponatremia is another complication that might cause TUR syndrome, which may result from the use of nonconductive solutions such as glycine 1.5%, or mannitol 5% for bladder irrigation during M-TURP.[5]

In these settings, bipolar TURP (B-TURP) was proposed as an alternative to M-TURP as it allow the use of normal saline solution 0.9% for bladder irrigation, thus it may be associated with the elimination of risk of TUR syndrome.[6]

On the other hand, Holmium laser enucleation of the prostate (HoLEP) is considered the ideal alternative to TURP and open simple prostatectomy in the management of large prostates (>80 g) as it is associated with less irrigation-related complications, better hemostasis, and shorter catheter periods and hospital stays.[7] Yet, laser prostatectomy requires the presence of certain facilities (e.g. laser device) that might not be available in all centers and may be associated with higher costs and longer learning curve.[8] In these settings, the current study aims to assess the safety and efficacy of B-TURP in the management of patients with large prostates (>100 g) based on a single center experience.

METHODS

Study type and patients

The database of Tanta university hospital-Egypt was retrospectively reviewed to identify all the consecutive patients with BPH undergoing B-TURP for large prostates (>100 g) between January 2018 and January 2019. Patients were excluded if they have an international prostatic symptom score (IPSS) <8, neurogenic bladder, suspicious of prostate cancer (abnormal digital rectal examination [DRE], elevated prostate specific antigen [PSA], or abnormal transrectal ultrasound [TRUS] guided biopsy), abnormal coagulation profile, and patients with renal insufficiency. All the included patients were signed an informed consent. This study was approved by the ethical committee of the Tanta university hospital (31290/12/16).

Patient's evaluation

Patients evaluation included the complete medical and surgical history, physical examination, DRE, urinalysis and culture, urinary tract ultrasound (including the assessment of post voiding residual urine [PVR]), TRUS of the prostate, uroflowmetry (including the peak urinary flow [Qmax]), and IPSS.

Surgical technique

All the patients were operated under spinal anesthesia. One urologist (AH) performed all the cases. B-TURP was performed with wire loop at 160 w cutting and 80 w coagulation current. Normal saline was used as the irrigation fluid during the procedure. A triple lumen urethral catheter was placed through the urethra post-operatively, and the bladder was irrigated continuously for 24 hours.

Variables

All the included patients had at least one year follow up. The primary endpoints included the postoperative evaluation of the IPSS, Qmax, and PVR at one, and 12 months. Secondary endpoints included the evaluation of perioperative outcomes (operative time, resected tissue weight, hemoglobin loss, blood transfusion, catheterization time and duration of hospital stay).

Statistical analysis

Continuous variables are presented as median and interquartile range (IQR), while categorical variables are presented as percentages. Related samples Wilcoxon signed ranked test was used to assess the improvement of IPSS over the follow up period.

RESULTS

Eight patients met our inclusion criteria and were included in the current study. The median age of the included patients was 59.5 (IQR=5.25, range 54-65) years old. The median prostate size was 115 grams (IQR=23, range 100-135). All the patients were operated under spinal anesthesia and no cases required conversion to open surgery. The operative time ranged from 65 to 90 minutes (median=77.5, IQR=20.25). The median volume of irrigation fluid used was 20.5 liters (IQR=4.5, range 19-25), and the median weight of resected tissue was 79.5 grams (IQR=22.75, range 64-90). Summary of the patients' data are reported in Table 1.

As regards the perioperative complications, only one patient (12.5%) suffered from intraoperative bleeding, which impaired the vision causing bladder injury but did not require blood transfusion. Furthermore, urinary tract infection was reported in two patients (25%). On the same hand, only one patient suffered from urethral stricture (12.5%).

During the follow up, the IPSS, Qmax, and PVR showed significant improvement at one and 12 months postoperatively as reported in the Table 2. However, there was no significant improvement between one month and 12 months for the three variables.

Table 1: Summary of the preoperative and operative data.

Variable	Patients	Range
Age in years (median)	59.5 (IQR=5.25)	54-65
Prostate size in grams (median)	115 (IQR=23)	100-135
PSA (median)	5.1 (IQR=2.95)	2-6
IPSS preoperative (median)	27 (IQR=14.25)	19-35
Qmax preoperative ml/sec (median)	5 (IQR=2.5)	2-8
PVR in ml (median)	184 (IQR=56.75)	127-200
Operative time in minutes (median)	77.5 (IQR=20.25)	65-90
Volume of irrigation fluid in L (median)	20.5 (IQR=4.5)	19-25
Weight of resected tissue in g (median)	79.5 (IQR=22.75)	64-90
Catheter time in days (median)	3.5 (IQR=1.75)	3-7
Hospitalization in days (median)	4 (IQR=2.25)	3-7
Hemoglobin Deficit	2.2 (IQR=0.75)	1.2-2.7
Sodium deficit	2 (IQR=1.75)	0-4

Table 2: Summary of improvement of the IPSS, Qmax, and PVR over the follow up period.

Variable	Pre-op	1 month	12 months	P
IPSS	27 (IQR= 14.25)	6.5 (IQR= 2.75)	7.5 (IQR= 2.5)	a=0.012 b=0.012 c=0.121
Qmax	5 (IQR= 2.5)	16.5 (IQR= 4)	19 (IQR= 4.5)	a= 0.012 b=0.012 c=0.276
PVR	184 (IQR= 56.75)	19.5 (IQR= 4)	19.5 (IQR= 11.75)	a=0.012 b=0.012 c=0.352

a=Preoperative versus one month; b=preoperative versus 12 months; c=one month versus 12 months.

DISCUSSION

In 2001, Botto et al, presented the first experience with the use of endoscopic bipolar electrode in the management of BPH.[9] The bipolar electrocautery allowed the use of normal saline 0.9% instead of glycine (a nonconductive irrigation fluid). This shift to saline reduced the risk of electrolyte disturbance, which in turn eliminated the risk of TUR syndrome.[10] A recent Cochrane review of 59 randomized controlled trial comparing monopolar TURP to B-TURP, concluded that both currents result in comparable improvement of the urological symptoms; however, B-TURP is associated with lower risk of TUR syndrome and blood transfusion.[11] In this setting, we evaluated the use of B-TURP in the management of prostates more than 100 g in size showing that it is a safe and efficient technology even for large prostates.

Kwon et al, compared open prostatectomy, monopolar TURP, versus B-TURP in patients with large prostates (>100 ml) showing that B-TURP is an effective and safe operation.[12] The authors reported that B-TURP was associated with significant improvement of the IPSS (22.5 to 8.9) and Qmax (5.6 to 15.9 ml/sec) in patients with large prostates (117.9±18.6 ml).[12] These findings are comparable to results of the current study, where B-TURP resulted in significant improvement of IPSS (27 to 7.5) and Qmax (5 to 19 ml/sec). It is worth mentioning that this slight difference in the results may be related to the longer follow up period in the current study (12 months versus 6 months). Furthermore, Kwon, reported a lower weight of resected tissues with B-TURP compared to the current study (41.4 vs 79.5); however, this may be explained by the recent advancements and improvements of the bipolar devices.[12] More recently, Srivastava et al, reported a resected weight of 78.1 g, which is comparable to the current studies.[13] Similarly, Finley et al, demonstrated a resected weight of 80.8 g; however, the prostate size in their series (207.4 cc) was larger than in our study.[14]

All the cases in the current series were performed by an experienced surgeon and this may explain the short operative time (77.5 minutes) reported in this study compared to the operative times reported by other authors (98.1, 132.9, and 163 minutes).[12,14,15] Furthermore, the median hospitalization time in the current case series was comparable to that documented in the literature.[12,13]

As regards safety, B-TURP showed to be safe, as only one patient (12.5%) suffered from intraoperative bleeding; however, no blood transfusion was required. Generally, B-TURP is associated with decreased risk of perioperative bleeding and blood transfusion by 34% compared to the conventional monopolar devices. [16] Furthermore, urinary tract infection is a common perioperative complication following TURP that may occur in 1.7-8.2% of patients; however, two patients (25%) in this case series reported UTI.[17–19] Moreover, urethral stricture may occur following TURP because of the large resectoscope sheath, which may cause urethral ischemia and/or trauma.[17] In this setting, one patient developed urethral stenosis 12 months after the surgery that was managed by optical urethrotomy.

Generally, the main disadvantages of B-TURP such as the cost are compensated by the shorter hospitalization, catheterization, and lower perioperative morbidity compared to the monopolar TURP.[10]

This study is not devoid of limitations including the retrospective nature, the small sample size, and the short follow-up period that are not sufficient to judge the late complication of B-TURP.

CONCLUSION

Bipolar TURP is associated with significant improvement of the urological symptoms resulting from large prostates (>100). It can be considered a safe and efficient minimally invasive alternative to open prostatectomy in well selected patients; however, further studies are required to confirm these results.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Mamdoh H, Elbendary M, Habib E, Hassan A. Bipolar transurethral resection of large prostate >100 gm: single center experience. Int Surg J 2021;8:780-3.