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Hemiprostatectomy; an Effective Option for Elderly Men with Benign Prostatic Hyperplasia Larger Than 200mls

Mohamed Alhefnawy[1], Basem Fathi[2], Mohamed H Zahran[3], Khaled Almekaty[4]

[1] *Urology Department, Benha University, Egypt*
[2] *Urology Department, Alazhar University, Egypt*
[3] *Mansoura Urology and Nephrology Centre, Mansoura University, Egypt*
[4] *Urology Department, Tanta University, Egypt*

Abstract

ObjectivesTo assess safety and efficacy of hemiprostatectomy in elderly men above 60 years with benign prostates more than 200mls in centers where laser and morcellators are not readily available.
MethodsThe records of such patients who underwent bipolar hemiprostatectomy between January 2013 and January 2022, all were retrieved and included in the study. Patients suspected for prostatic carcinoma or with prostate volume <200 mls were excluded. All patients came after 1, 3 and 6 months postoperatively for checking improvement in International Prostate Symptom Score (IPSS), maximum urinary flow rate (Qmax) and post-void residual urine volume (PVR) and report any complications.
ResultsRegarding efficacy of the technique, all micturation parameters improved at 1, 3 and 6 months postoperatively. The overall complication rate was 43.33%. Intraoperatively 2 patients developed hypertension, while postoperatively retention, heamaturia, residual adenoma requiring redo surgery, urethral stricture and meatal stenosis occurred in 3,4,2,1 and 1 patient respectively.
ConclusionsHemiprostatectomy seems to be a safe and effective option when prostatectomy is indicated in elderly men with large prostates and medical comorbidities, especially in centres where laser and morcellators are not readily available.
KeywordsBenign prostatic hyperplasia; transurethral resection of prostate; lower urinary tract symptoms; International Prostate Symptom Score; hemiprostatectomy

Introduction

Benign Prostatic Hyperplasia (BPH) is considered an aging process that affects most of elderly people leading to bothersome urinary symptoms that affect their quality of life. It is considered the most frequent tumour requiring resection in this age group.

When prostatectomy is mandated, transurethral resection of the prostate remains the gold standard option. However, in this group of patients, urologists face 2 main challenges; the first is the associated comorbidities such as diabetes, hypertension, cardiac diseases and their impact on risk of anaesthesia and the need to shorten the operative time. The second one is the large gland size which is frequently reached in this age group which theoretically can increase the operative time and consequently the potential risk of complications.

New techniques have emerged to achieve comparable efficacy to conventional Transurethral Resection of the Prostate (TURP) with less intra and postoperative complications such as laser and bipolar prostatectomy. However, in elderly people with medical comorbidities and prostate larger than 200mls, these techniques might not be enough to achieve effective safe procedure.

In our region, the incidence of large-sized prostate is higher than the incidence in European countries and the US. This can be attributed to the poor primary care offered in rural areas. This aspect is quickly improving, but still not uncommon to see large prostates with extremely severe long standing Lower Urinary Tract Symptoms (LUTS), never seeked any medical advice. In this context, we tried to test the hypothesis of removing only half of the prostate gland “hemiprostatectomy” or “hemi-TURP” as an option to relieve BPH bothersome symptoms in elderly men with prostates larger than 200mls.

Methods:

This is a multicentre study that was conducted after attaining ethical committee approval (RC3792023). The records of elderly patients with medical comorbidities (diabetes, hypertension and cardiac diseases) who underwent hemi-TURP between January 2013 and January 2022, all were retrieved and included in the study.

Inclusion criteria were: old patients >60 years with LUTS secondary to bladder outlet obstruction with prostate size ≥200mls and IPSS of ≥8, Qmax < 15 m/s, not responding to medical treatment, and/or complicated BPH eg recurrent haematuria or refractory retention.

Records of patients suspected for prostatic carcinoma or with prostate volume <200 mls were excluded from the study. All cases were assessed preoperatively with a full history and thorough clinical examination including (International Prostate Symptom Score) IPSS, Qmax and ultrasonography with PVR (Postvoiding Residual) measurement.

In our centres and during the study period of time, neither laser nor morcellators were available. So, bipolar TURP was the best available option. All

patients underwent bipolar hemi-TURP in order to remove the obstructing adenoma and at the same time cut down the operative time and the potential heamodynamic changes and possible intra and postoperative complications. The median lobe was resected first then the larger of the two lateral lobes. It is actually partial prostatectomy, not always an accurate hemiprostatectomy as sometimes there is a median lobe that needs to be removed or unequal enlargement of the lateral lobes.

Bipolar TURP required a bipolar high-frequency generator, bipolar resection loops and a continuous flow setup to ensure sufficient visibility. Normal saline 0.9% was used as the irrigant fluid. A 26-F continuous-flow resectoscope was used following the Mauermayer principle doing the resection. The same competent senior urology consultant with extensive experience in TURP did all the procedures. Urethral catheter was removed within the first postoperative week. All patients came after 1 week, 1, 3 and 6 months postoperatively for follow up. The primary outcome measure was assessment of efficacy of the technique by detecting changes in IPSS, Qmax and PVR. The secondary outcome measure aimed to assess safety of the procedure by detecting changes in serum Na+, K+, Heamoglobin (Hb) and haematocrit/packed cell volume (PCV). All were measured before and immediately after surgery. Intra and early postoperative complicationswere reported. In addition, follow up visits 3 and 6 months postoperatively were reported to detect any remote postoperative drawbacks and report on long-term improvement in micturation parameters.

Statistical analysis: statistical evaluations were performed using the mean, standard error, t-tests, and Fisher's exact test, utilizing SPSS (Statistical Package for the Social Sciences) for Windows version 12. A P-value of less than 0.05 was considered indicative of a statistically significant difference.

Results

The records of 30 patients with large prostates (>200mls) who underwent hemiprostatectomy done by a senior resectionest; all were revised. Table1 breaks down the baseline demographics and preoperative data of the study population. Indications of intervention were LUTS resistant to medical treatment, refractory retention and haematuria in 14, 10 and 6 patients respectively. The median (IQR) operative time was 87min (70-99).

Regarding safety of the technique, there were no cases of perioperative mortality. The overall complication rate was 43.33%. Table 2 throws the shadow on intra and postoperative complications. It is important to note that the median (IQR) Hb dropped from 12.7 (11.9-13) to 11.5 (11-12) and PCV dropped from 39 (37-42) to 35(34-38); which was statistically significant. ($P<0.001$ for both) On the other hand, serum Na and K didn't significantly change perioperatively. The median (IQR) serum Na changed from 139 (137-141) to 138.5 (136-141), while serum K changed from 4.3 (3.8-4.5) to 4.1 (3.7-4.3). ($P=0.51$ & 0.52 respectively)

Regarding efficacy of the technique, the Q max, IPSS and PVR improved significantly through the 3 time points (after 1, 3 and 6 months). (table3)

Table1: Demographics and pre-operative data

Criteria	
Age *Median (IQR)*	65 (59-69)
Comorbidities: No (%) *DM* *HTN*	 8 (27%) 5 (17%)
Indwelling urethral catheter: No (%)	10 (33%)
ASA score: No (%) *I* *II*	 16 (53%) 14 (47%)
IPSS *Median (IQR)*	 25.5(22-30)
Qmax (mls/s) *Median (IQR)*	 7 (4-8)
PVR (mls) *Median (IQR)*	 172(82-200)
Preoperative Na *Median (IQR)*	139 (137-141)
Preoperative K *Median (IQR)*	4.1(3.8-4.5)
Preoperative Hb *Median (IQR)*	12.7 (11.9-13)
Preoperative HCT *Median (IQR)*	39 (37-42)

Table 2: complications of the hemiprostatectomy procedure

Complications	Management	No (%)
Intraoperative complications Hypertension	Alpha blockers	2 (7%)
Early postoperative complications: (<1st month) Retention Hematuria	Catheterization for 3 days Bladder wash for 2 days	3 (10%) 4 (13%)
Late postoperative complications: (>3 months) Residual adenoma Stricture urethra Meatal stenosis	redo-surgery dilatation meatoplasty	2 (7%) 1 (3.3%) 1 (3.3%)
Total		13 (43.33%)
Modified Clavien - Dindo System Grade I Grade II Grade III Grade IV Grade V	7 (catheterization and bladder wash) 0 4 (surgical intervention) 0 0	

Table 3: Functional outcomes

	Preoperative	1 month	P value	3 months	P value	6 months	P value
IPSS Median (IQR)	25.5(22-30)	12 (8-15)	<0.001	13 (10-17)	<0.001	4(10-16)	<0.001
Q-max (ml/s) Median (IQR)	7 (4-8)	17(15-18)	<0.001	16 (14-18)	<0.001	14 (13-16)	<0.001
PVR (mls) Median (IQR)	172 (82-200)	35(23-42)	<0.001	40 (25-52)	<0.001	50(40-53)	<0.001

P: compared to pre-operative values using Wilcoxon matched-pair signed-rank test.

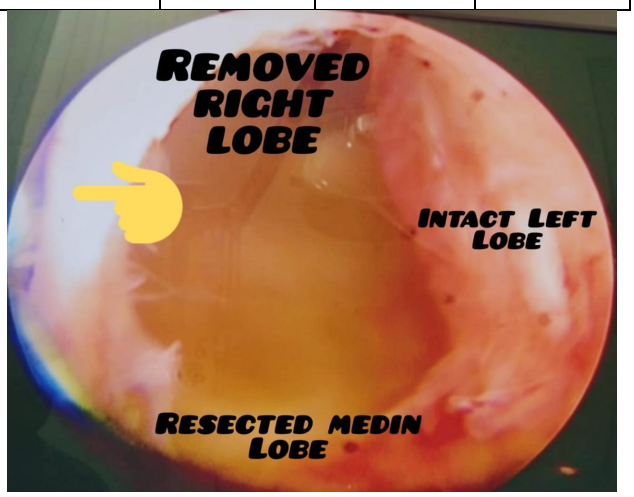

Figure1: Hemiprostatectomy; resection of the median lobe and one lateral lobe.

Discussion

Men with BPH can be offered a wide variety of options from just watchful waiting up to open prostatectomy. Whenever prostatectomy is necessary, TURP remains the gold standard option.[1]

Many recent growing technologies have invaded the field of BPH such as laser and bipolar prostatectomy.

Men older than 60 years suffering from resistant BPH-related LUTS who had concomitant medical comorbidies such as diabetes and ischemic heart and underwent hemiprostatectomy “or hemiTURP”; all were included in the current study.

After an extensive literature search, we discovered a rarity of studies evaluating alternatives that could be offered to elderly men with medical comorbidities who cannot withstand a lengthy prostatectomy procedure with its potential hazards and heamodynamic instabilities. This is particularly important in countries and centres where advanced technologies such as laser and morcellators are not readily available. This was the rationale behind the current study. The term “hemiprostatectomy or hemi-TURP” was not introduced to the scientific society before. Herein, we aimed to look at safety and efficacy of hemiprostatectomy in the above-mentioned cohort of patients.

Early reports showed that TURP was a highly morbid procedure with total morbidity and mortality reaching upto 18% and 2.5%, respectively. Obviously, recent technological advances and enhancement of the learning curve have changed TURP from a relatively morbid to a routine safe procedure with speedy convalescence and a significant reduction in the mortality and morbidity down to 0.1% and 11% respectively.[5] However, this might not be enough in a particular group of patients such as those included in the current thesis. In the current study, no perioperative mortality was encountered. Regarding morbidity of the technique, a single patient developed hypertention intraoperatively, while 12 patients developed postoperative complications as shown in table 2 which classifies them according to the modified Clavien–Dindo system.

Transfusion rates in the early TURP reports were relatively high “approaching 20%”. Recent reports confirmed that this rate considerably dropped to 2.9%. The superior abilities of the bipolar current were long-established by many studies. Better haemostasis can be achieved through deeper coagulation and the ‘cut and seal’ effect of plasma that the bipolar current creates.

In the current series, blood loss-related complications were generally few. None of the patients had significant intraoperative bleeding or required blood transfusion.

Perioperatively, Hb and PCV dropped from 12.7 (11.9-13) to 11.5 (11-12) and from 39 (37-42) to 35(34-38) respectively, which was statistically significant, but didn’t necessitate blood transfusion.

On another note, the duration and amount of postoperative bladder irrigation

were used as additional objective parameters to evaluate haemorrhagic complications and haemostasis. In the current series, irrigation was done overnight and then stopped for 24 hours, then the catheter was removed after a total of 48 hours in most cases. Only 3 cases needed recatheterization to treat retention and re-wash of the bladder was needed in 4 cases as shown in table 2.

Post Transurethral Resection (post-TUR) syndrome is another critical potential complication especially in elderly people, which is commonly referred to as an argument against TURP. In the present study, no cases developed post-TUR syndrome. In earlier monopolar TUR series, Post-TUR syndrome ranged from 2% to 2.8%. This has been significantly reduced in recent series down to 0% to 0.8%. Generally, the incidence of post-TUR syndrome rises with a resection times of more than 90 min and gland size of more than 45 g. In the study population, patients' age and the gland size, both would theoretically increase the risk of increasing the operative time and consequently the risk of developing post-TUR syndrome, and this was the rationale behind this study. Fortunately, resecting half of the adenoma seems to have reduced the operative time and the potential heamatological changes that can accompany the procedure. So, none of the study population developed post-TUR syndrome.

A key benefit of bipolar technology is its ability to prolong the safe vaporization or resection time while ensuring patient safety is not compromised. However, this is not without limits especially with elderly with comorbidities, cardiovascular risks and large prostates more than 200mls.

In this study, there were no significant perioperative changes in the haematological parameters of serum Na or K. On the other hand, Hb and PCV showed statistically significant decrease, but there was no need for blood transfusion ie clinically insignificant changes. This is not only attributed to the use of bipolar technology, but also to the hemiprostatectomy technique postulated in this work which cut down the operative time and haematological disturbances. The median (IQR) operative time in this series was 87min (70-99).

Of note, variable protocols are adopted by different centres for catheter removal following TURP, so it is difficult to compare catheter removal between different studies. In this study, catheters were removed 48 hours postoperatively if the urine became clear.

Recatheterization was required in 3 patients for 3 days each in order to treat postoperative retention.

TURP can produce up to 10 mls/s (165%) improvement in the Qmax and 70% reduction in the IPSS. One of the most important targeted questions of the current study is whether or not removing only half of the prostate would jeopardize the functional outcome. Interestingly, the present study proved that hemiprostatectomy was effective in improving all of the micturation parameters (Qmax, IPSS and PVR) at the 3 time points of the study. (table3)

In the present series, the follow-up period extended up to 6 months after the initial surgery.The successful outcome reported at the 3-month visit was also maintained at 6 months.

Secondary endourological procedure (internal urethrotomy, bladder neck incision or reTURP) within 8 years after the initial procedure is reported to be 14.7%.In this study, the retreatment rate was 4/30 (13.33%) in the form of reTURP in 2, urethral dilatation in 1 and meatoplasty in 1 patient.

To our knowledge, this is the first time to introduce the term of “hemiprostatectomy or hemi-TURP” to the scientific society and investigate the outcome of such procedure in elderly men with large prostates more than 200mls. Limitations of the current study are the lack of longterm reports beyond 6 months and the retrospective design, thus further well-designed studies are needed to consolidate our initial conclusions.

The current series has some limitations; first is lack of long-term data beyond six months. Secondly, being based on a retrospective design. As a result, more well-designed studies are required to reinforce these initial conclusions.

Conclusions

This is a primary announcement that hemiprostatectomy seems to be a safe and effective treatment option when prostatectomy is mandated in elderly men with large prostates and medical comorbidities necessitating quick procedure, especially in centres where laser and morcellators are not readily available.

Declarations:

The authors take responsibility for every aspect of the work, ensuring that any concerns regarding the accuracy or integrity of any part are thoroughly examined and addressed. The research was carried out in line with the Declaration of Helsinki and received approval from our institutional review board (IRB approval No. RC3792023), with individual consent for this retrospective analysis being waived.

Ethical approval and consent to participate: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki. The study was approved by our institutional review board. (IRB approval No. RC3792023) and individual consent for this retrospective analysis was waived.

Conflict of interest:None

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List of abbreviations:

- BPH: Benign Prostatic Hyperplasia
- Hb: Heamoglobin
- IPSS: International Prostate Symptom Score
- LUTS: Lower Urinary Tract Symptoms
- PCV: packed cell volume
- Post-TUR syndrome: Post Transurethral Resection syndrome
- PVR: post-void residual urine volume
- Qmax: maximum urinary flow rate
- TURP: Transurethral Resection of the Prostate

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***Correspondence:**

- Khaled H. Almekaty
- ORCID: 0000-0002-9815-7035
- Urology department, Tanta University, Tanta, Egypt
-El-Gharbia Govenorate, Tanta. El-Gash st. Medical Campus, The Faculty of Medicine
-Postcode: 31527
-E-mail: dr.khaledhafez@yahoo.com
-Tel: 2+ 040 3337544
- Fax Number: 2+ 040 3407734