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Original Research Paper

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COMPARATIVE ANALYSIS OF EFFICACY OF HOLEP VS BIPOLAR TURP IN BPH PATIENTS: A RETROSPECTIVE ANALYSIS

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ABSTRACT **Objective:** To evaluate the efficacy of HoLEP as compared to Bipolar TURP in terms of postop and follow up parameters. **Methods:** A retrospective study was done in BPH patients who underwent Bipolar TURP and HoLEP in between May 2022 to April 2024. A total of 63 patients were assessed which comprised of 30 patients of Group 1 (Bipolar TURP) and and 33 patients of Group 2 (HoLEP). Patients were assessed in terms of Resected tissue weight, Hemoglobin drop, Change in Sodium, Post op IPSS, QoL, Qmax, PVR at 1 month and 3 months follow up. **Results:** Post op parameters like resected tissue weight was found to be significantly more in HoLEP group as compared to Bipolar TURP ($p = 0.001$), there was no significant difference in Hemoglobin drop and change in sodium levels between the two groups ($p=0.09$) and ($p=0.92$). Follow up parameters like Qmax at 1 month and 3 months post op was found to be significantly better in HoLEP group as compared to Bipolar TURP group ($p=0.002$) and ($p=0.032$). IPSS, Qol and PVR at 1 month and 3 month follow up were similar in both the groups ($p>0.05$). **Conclusion:** Both HoLEP and Bipolar TURP showed similar results in terms of Hemoglobin drop, change in Sodium , IPSS, Qol and PVR but there was a significant difference in resected tissue weight and post op Qmax favouring HoLEP as compared to Bipolar TURP.

KEYWORDS : Benign Prostatic Hyperplasia, Bipolar Transurethral Resection of Prostate, Holmium Laser Enucleation of Prostate, Prostatomegaly

INTRODUCTION

Benign Prostatic Hyperplasia (BPH) in men is a common disorder linked to physiological ageing. The frequency is more among men aged 70 years, however, the symptoms can be noted as early as 60 years.

Transurethral Resection of the Prostate (TURP) is the definitive surgical intervention for benign prostatic hyperplasia (BPH) [1]. Ample evidence has supported its therapeutic efficacy in improving urinary flow rates and alleviating obstructive voiding symptoms, offering an 85–90% success rate. Nevertheless, 15–20% patients who undergo TURP develop significant complications such as hematuria, TUR syndrome (TURS), bladder neck stricture, incontinence or retrograde ejaculation, and 10–15% patients require a second intervention within 10 years [2]. In recent years, several alternative techniques have been reported for minimizing these adverse effects.

One of the newer advances is Bipolar TURP (B-TURP). In this technique, electricity runs between an active and a passive electrode, converting the irrigation solution (i.e. normal saline) into a plasma layer that disintegrates tissue on contact [3]. The major advantage of bipolar energy systems in contrast to mono-polar systems such as TURP is the use of saline as irrigation fluid, thus minimising the risk of TUR syndrome.

P. Gilling and M. Fraundorfer developed a technique for holmium-laser prostate resection (HoLRP) [4] in 1996, which was subsequently refined to HoLEP with the advent of Morcellator [5]. HoLEP is an advancement of the traditional TURP procedure. Unlike in TURP where prostate tissue is excised from the centre to the periphery, repeatedly exposing the arteries until the capsule level is attained, HoLEP replicates open prostatectomy as a genuine anatomical enucleation. Holmium Laser is used similar to what a finger used to do in open prostatectomy and separates in the stratum between the surgical capsule and the adenomatous tissue with simultaneous control of the bleeding vessels.

Advancements in laser technology, enhanced understanding of tissue-laser interactions, and substantial clinical experience have positioned HoLEP laser treatment for BPH as a competitor to TURP. The Holmium: YAG laser is a pulsed solid-state laser that offers considerable benefits for endourological procedures. The wavelength of 2140nm enables significant absorption by tissue water, leading to rapid vaporisation of exposed tissues at a depth of approximately 0.4mm with coagulation occurring 3 to 4mm beyond the vaporisation surface. This produces an exact, bloodless area that inhibits systemic fluid absorption [5].

In recent years, lasers have marked a significant advancement in the surgical management of BPH. Currently, TURP is the benchmark for treating prostatic hyperplasia. However, HoLEP is emerging as a favourable option in BPH management, particularly for patients with an elevated risk of hemorrhage (e.g., those using anticoagulant or anti-aggregant therapy). [5-8]

Consequently, given the rise in the average age of the population and the corresponding increase in the prevalence of this age-related pathology, we assert that this procedure is highly rational for elderly patients, even in cases of small prostates, particularly considering that this demographic

frequently receives anticoagulants or antiplatelet medications.

Although there are many studies comparing Bipolar TURP or HoLEP to TURP but very less studies were found that analysed Bipolar TURP in comparison to HoLEP in the terms of efficacy. The objective of this study is to compare HoLEP with respect to Bipolar TURP in the terms of resected gland weight, Hemoglobin drop, change in Sodium levels. Additionally, the authors would also proceed to assess the improvement in IPSS, IPSS-QoL, Qmax, Post-void residue(PVR) at 1 month and 3 months post op in patients of both the groups.

MATERIAL AND METHODS

This is a retrospective, observational study performed in the Department of Urology, in our Hospital. The study included all the patients with symptoms of Benign Prostatic Hyperplasia that underwent HoLEP or Bipolar TURP surgery between May 2022 to April 2024. A total of 63 patients who had complete records were assessed for the study which included 30 patients in Group 1 (Bipolar TURP) and 33 patients in Group 2 (HoLEP).

The patients having UTI were treated preoperatively with antibiotic therapy. A blood PSA level above 4 ng/ml and a notable digital rectal examination warranted the performance of a TRUS-guided biopsy when suspicion arose. The patients having histopathology reports indicating prostate cancer, patients with neurological or mental disorders affecting urinary control, or those with conditions causing bladder outlet obstruction, such as urethral stricture or bladder stones, bladder tumours and those patients with prior surgical history involving the prostate, urethra, or pelvis were excluded.

Following the acquisition of approval from Ethics committee, the Hospital records were accessed. The pre-operative parameters evaluated included Age, International Prostate Symptom Score (IPSS) with Quality of Life (QoL), maximum urine flow rate (Q max), prostate volume, and post-void residual urine (PVR). Intraoperatively weight of the resected gland was documented. Postoperatively, on POD 1 blood hemoglobin levels, serum sodium levels were noted. And on follow up at 1 month and 3 months, an evaluation of IPSS, QoL, Q max, and PVR was conducted.

For Bipolar TURP, a 26Fr Olympus Resectoscope with bipolar loop of TURiS Olympus set(Olympus, Tokyo, Japan) was used. For HoLEP, 26Fr Karl Storz Resectoscope with 100W Holmium: YAG laser Lumenis Versaplus Powersuite with 550 um fiber and Morcellator Lumenis Versacut (Lumenis, Yokneam, Israel) was used.

STATISTICAL ANALYSIS

Data was entered in Microsoft Excel and IBM SPSS Chicago, Illinois, USA version 29 was used for statistical analysis. Quantitative data were expressed as mean +/- standard deviation. Comparison between the mean values of the two groups was performed using the Student t test, while comparison between paired samples was performed using paired t test. P values </= 0.05 were considered statistically significant.

RESULTS

In Baseline preoperative parameters (see Table 1) the mean age of the study population in bipolar group was 70.56 years and in holep group it was 71.85 years (p=0.224). The average Prostate size in bipolar group was 77gms and in holep group it was 91.88 gms (p<0.001). Baseline mean PSA in bipolar group was 6.84 ng/ml and holep was 7.95 ng.ml (p=0.471). Preop mean Hemoglobin was 13.05 gm/dl in bipolar group and 12.62 gm/dl in holep group (p=0.209). Preop mean Qmax in bipolar group was 4.8ml/sec and 4.36 ml/sec in holep group (p=0.139). Preop mean QoL in bipolar group was 5.06 and 5.09 in holep group (p=0.861). Average preop IPSS was 27.31 in bipolar group and 28.85 in holep group (p<0.001). The average preop PVR was 191.28 ml for bipolar group and 205.82 ml in holep group (p=0.313).

Table 1: Pre-operative Parameters

PRE-OPERATIVE BASELINE	BIPOLAR	N	HOLEP	N	P VALUE
AGE (YRS)	70.56 ± 9.73	30	71.85 ± 7.73	33	0.224
PROSTATE SIZE (GM)	77.53 ± 6.44	30	91.88 ± 12.41	33	<0.001
PSA (NG/ML)	6.84 ± 6.05	30	7.95 ± 6.37	33	0.471
PRE-OPERATIVE HEMOGLOBIN (GM/DL)	13.05 ± 1.43	30	12.62 ± 1.26	33	0.209
PRE-OPERATIVE QMAX (ML/SEC)	4.8 ± 1.36	30	4.36 ± 0.98	33	0.139
PRE-OPERATIVE QoL	5.06 ± 0.62	30	5.09 ± 0.68	33	0.861
PRE-OPERATIVE IPSS	27.31 ± 1.4	30	28.85 ± 1.52	33	<0.001
PRE-OPERATIVE PVR (ML)	191.28 ± 55.96	30	205.82 ± 59.19	33	0.313

P value <0.05 significant

When we compared the postop parameters (see Table 2) we found an average hemoglobin drop of 0.62 gm/dl in bipolar group and 0.6 gm/dl in holep group. Mean resected weight between the two groups, were 36.5 gm and 41.61 gm in bipolar and holep group respectively and statistically significant difference was noted (p 0.001). On assessing the change in serum sodium levels, we noted an average change of 1.53meq/l in bipolar group and 2.55 meq/l in holep group (p=0.092).

Table 2: Post-operative Parameters

POST-OPERATIVE PARAMETERS	BIPOLAR	N	HOLEP	N	P VALUE
HEMOGLOBIN DROP (GM/DL)	0.62 ± 0.19	30	0.6 ± 0.17	33	0.09
RESECTED WEIGHT (GM)	36.5 ± 5.36	30	41.61 ± 6.63	33	0.001
SODIUM CHANGE (MEQ/L)	1.53 ± 2.66	30	2.55 ± 2.09	33	0.92

P value <0.05 significant

On assessing the follow up parameters at 1 month and 3 months (see Table 3) we found mean IPSS to be 3.63 and 3.13 for bipolar group and 3.3 and 2.88 for holep group (p>0.05). Mean QoL at 1 month and 3 month were 0.97 and 0.56 for bipolar group and 1.06 and 0.58 for holep group (p>0.05). The average PVR at 1 month and 3 month were 19.09 ml and 16.09 ml for bipolar group and 18.91 ml and 16.24 ml in holep group (p>0.05). When we assessed the Qmax pre-operatively, and it changed over 1 and 3 months, with a mean Qmax of 18.91 ml/sec and 18.35 sec in bipolar group and 17.82 ml/sec and 19.4 ml/sec in holep group we observed a significant improvement with holep as compared to bipolar group (p<0.05).

Table 3: Follow up Parameters

FOLLOW-UP	BIPOLAR	N	HOLEP	N	P VALUE
IPSS 1 MONTH	3.63 ± 0.91	30	3.3 ± 0.85	33	0.144
IPSS 3 MONTHS	3.13 ± 0.61	30	2.88 ± 0.65	33	0.12
QOL 1 MONTH	0.97 ± 0.65	30	1.06 ± 0.83	33	0.62

QOL 3 MONTHS	0.56 ± 0.5	30	0.58 ± 0.5	33	0.96
PVR 1 MONTH (ML)	19.09 ± 5.23	30	18.91 ± 5.2	33	0.87
PVR 3 MONTHS (ML)	16.09 ± 4.77	30	16.24 ± 4.62	33	0.899
QMAX 1 MONTH (ML/SEC)	18.91±1.41	30	17.82± 1.29	33	0.002
QMAX 3 MONTHS (ML/SEC)	18.35±1.31	30	19.4±1.46	33	0.032

P value <0.05 significant

DISCUSSION

Benign prostatic hyperplasia (BPH) is a prevalent chronic condition that significantly impacts the quality of life of elderly male patients. It is characterised by prostate enlargement, leading to bothersome lower urinary tract symptoms (LUTS) associated with both bladder filling (irritative symptoms) and emptying (obstructive symptoms) [9,10]. This issue is a significant socio-economic challenge, affecting both the quality of life of patients and the healthcare system that bears the expenditures associated with this disease [11-13].

Newer technological advancements like the holmium laser and bipolar energy resectoscope have significantly decreased complications and made it possible to operate on elderly patients with a high burden of comorbidities who are unable to stop taking their antiplatelet/anticoagulant medications [14,15].

Currently, the guidelines indicate Bipolar TURP as a proven and effective method for the treatment of BPH with PV < 80 mL, while for a PV > 80 mL, the HoLEP results are more favourable [16]. Both the EAU and American Urological Association (AUA) recommendations propose HoLEP as a size-independent therapy option for patients with moderate to severe LUTS [16,17].

Bipolar TURP and HoLEP offer numerous benefits, including diminished bleeding, reduced necessity for blood transfusions, and a lower risk of TUR syndrome, a potentially lethal condition and the primary contributor to Monopolar TURP-related morbidity [8,18,19].

The mean age of our study population was 71.22 ± 8.73 years, which was similar to the studies done by Fuschi et al [20] and Kanchi et al [21].

In the present study, the weight of the resected specimen was observed to be higher in weight in the HoLEP group as compared to Bipolar TURP group. In a study by Gilling et al [22], the resected specimen was observed to be 40.4 ± 5.7 gm when compared to the 24.7 ± 3.4 gm resected by TURP. Fayad et al [23], however, found no significant difference. (The mean resected prostatic volume was 61.167 grams in the HoLEP group and 58.8 grams in the bipolar group).

In the present study, the hemoglobin drop was noted to be comparable in both groups. In a study by Fayad et al, [23] the drop in the hemoglobin level was more in the bipolar group (group B) as compared to the HoLEP group (group A) and this was found to be statistically significant, (P-value= 0.001). Similarly, a significant drop was noted in hemoglobin levels in the study by Fuschi et al [20] and Gillian et al [22].

In the present study, IPSS, Qol and PVR at 1 month and 3 months were improved but no significant difference were seen between the two groups. Similar findings were noted in the studies conducted by Kanchi et al [21] and Fuschi et al [20].

In our current study we have observed a significant improvement in Qmax at 1 month (p value= 0.002) and 3 months (p value= 0.032) with HoLEP group as compared to Bipolar TURP group. In a similar study conducted by Fayad et al[23] there was a significant improvement in Qmax seen at 12 months postop in Holep group as compared to Bipolar TURP (P-value=0.05). Fuschi et al [20] and Kanchi et al [21] reported there was an improvement in Qmax but it was not found to be significant when compared to Bipolar TURP group.

CONCLUSION

In our study we found that both Bipolar TURP and HoLEP are effective techniques to treat patients with BPH and provided similar improvement in PVR, IPSS, Qol scores of patients. There was a significant difference noted in resected tissue weight and post op Qmax both favouring HoLEP group.

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