

Monopolar versus Bipolar Transurethral Resection of Prostate in Terms of Surgical Outcomes and Efficacy

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Abstract

Background: Endoscopic procedures like Trans urethral resection of prostate are scarless surgeries for benign prostatic hyperplasia, and unlike any other surgery, it has its ups and downs. Monopolar-TURP has been the standard of treatment for BPH but over time there has been a shift towards Bipolar-TURP.

Methods: The present study is undertaken to study and compare postoperative outcomes after monopolar and bipolar transurethral prostate resection. An ambispective observational study was conducted on 68 patients who underwent transurethral resection of prostate From October 2017 to November 2021. Patients were placed in either M-TURP group (n=34) or B-TURP group (n=34), on the basis of surgical unit performing the procedure. Patients were followed for a period of three months after surgery and its outcomes (complications: hematuria, dysuria, incontinence, retrograde ejaculation and erectile dysfunction) were assessed and compared using Statistical Package for the Social Sciences (SPSS) v 20.0 (IBM Corp.) and Medcalc 19.5

Results: The age distribution shows the predominant age group to be of 71-75 years in both groups i.e. M-TURP (32.4%) and B-TURP (32.4%) respectively patients were comparable with age, prostate size and IPSS score and other complications. The mean hospital stay days was varied from 4.29±1.54 to 3.64±0.73 for Monopolar and Bipolar group respectively.

Conclusions: Our study indicates that Bipolar and Monopolar Transurethral Resection of Prostate are comparable in terms of surgical outcomes and post operative complications. Bipolar TURP with better outcomes is the procedure of choice for benign prostatic hyperplasia.

Keywords: Bipolar transurethral resection of prostate (B-TURP), monopolar transurethral resection of prostate (M-TURP), BPH- Benign prostatic hyperplasia.

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Introduction

Enlarged prostate is one of the most common cause of lower urinary tract symptoms (LUTS) in elderly men. LUTS can be subdivided into voiding symptoms

and storage symptoms which include hesitancy, thin stream, intermittency, post void dribble, decreased force of urination, straining, nocturia, frequency and dysuria.

Management of patients with benign prostatic hyperplasia depends on symptomatology of the patient and objective assessment by IPSS scoring. Treatment options available range from simple watchful waiting to open prostatectomy. In between this is a range of medical management with alpha blockers or 5 alpha reductase inhibitors and various minimally invasive and endoscopic procedures like TURP, TUNA, TULIP, TUVF, and TUIP. The EAU guidelines, based on grade A evidence, recommends TURP for prostates between 35 and 80 ml. Over that limit, open surgery seems to remain the only option for treating BPH, according to available clinical evidence. M-TURP has been the gold standard for management of BPH but in recent times there has been a gradual shift from monopolar to bipolar resection. Although significant technical improvements over the past decades have decreased the adverse events associated with the procedure, concerns still remain regarding complications, such as the TUR syndrome, bleeding per urethra, and urethral strictures etc.

Incorporation of bipolar technology represents a significant technical improvement in TURP over recent years. Bipolar TURP addresses a fundamental flaw of Monopolar TURP because it can be performed in normal saline and hence decreasing irrigant related complications. And in this content of changing trend from monopolar to bipolar resection the present observational study was conducted to assess safety and efficacy of postoperative outcomes and complications after monopolar and bipolar transurethral prostate resection.

Methods

Aims and Objectives

1. To study about postoperative outcomes after monopolar and bipolar transurethral prostate resection.

2. To determine safety and efficacy of each procedure.
3. To compare post-operative complications in each procedure.

This ambispective observational study was conducted on 68 from October 2017 to November 2021 admitted at Hamidia Hospital, Bhopal, Madhya Pradesh, India. Patients were placed in monopolar (34) or bipolar resection arm (34) depending on surgical unit performing the operation and surgeons choice. The study was approved by the Ethical Clearance Committee of hospital (letter no.456 /MC/IEC/2020 dated 04/01/2020)

Inclusion Criteria

1. Symptomatic benign prostatic hyperplasia including patients with acute urinary retention.
2. Prostate size 30 cc to 80 cc on USG evaluation.

Exclusion Criteria

1. Previous open or transurethral prostatic surgery.
2. History of urethral stricture.
3. Patient interested in future fertility.
4. Patient with known neurogenic bladder dysfunction.

Methodology

Group A: Monopolar TURP was performed using a 26F continuous flow resectoscope. 30-degree lens, standard tungsten cutting wire loop, and 1.5% glycine as irrigation media. Power setting used was 120W for cutting and 80W for coagulation. The resection was carried down to the surgical capsule with the distal limit being the verumontanum.

Group B: Bipolar TURP was performed using a 26F continuous flow resectoscope. The Karl Storz system was used for the procedure. A 30-degree lens and 0.9% saline as irrigant were used for the procedure. Power settings used were 180W for cutting

and 90W for coagulation. As with monopolar TURP, the resection was carried down to the surgical capsule with the distal limit being the verumontanum.

Postoperatively catheter was removed on 2nd day unless complications were suspected.

Statistical Analysis

The findings were recorded on a predefined Performa. The collected data were compiled in a Microsoft Excel sheet and subsequently statistically analysed. Descriptive and inferential statistical analyses were carried out in the present study. Results on continuous measurements are present on Mean \pm SD (Min.-Max.) and results on categorical measurements are presented in Number (%). The statistical software SPSS version 20 (The Standard Protocol for Social Sciences) and Medcalc 19.5 were used for the analysis.

Results

Out of 68 patients, 34 underwent monopolar transurethral resection and 34 underwent bipolar transurethral resection of prostate. More than half of the patients belonged to

the group age from 71-75 years in both groups.(table-1)

Comparison between age, prostate size and ipss score was done which showed no significant difference. (figure-1)

Comparison of Difference in preoperative and post operative HB level was done which showed better control of bleeding in bipolar arm (table-2)

Comparison of occurrence of TUR Syndrome between the two groups of patients showed TUR syndrome only in one patient in monopolar group. (Table-3)

Comparison of Clot Retention between the two groups (figure-2) showed no difference in the outcome.

Comparison of urinary incontinence between the two groups was done (Table-4) which revealed more complication rate in the monopolar arm.

Comparison of hospital stay between the two groups was done which showed statistically significant difference in form of early discharge in the monopolar group. (Table-5)

Table 1: Comparison of age distribution with regard to procedure being undertaken

Age group	M-TURP		B-TURP		p value
	No.	%	No.	%	
56-60 yrs	4	11.8	7	20.6	0.6209
61-65 yrs	1	2.9	3	8.8	
66-70 yrs	10	29.4	7	20.6	
71-75 yrs	11	32.4	11	32.4	
>75 yrs	8	23.5	6	17.6	
	34	100.0	34	100.0	

Table 2: Comparison of Difference in preoperative and post-operative HB level

Difference in Hb level	M-TURP		B-TURP		
	No.	%	No.	%	
<1	6	17.6	0	0.0	6 (8.8%)
1-2	25	73.5	32	94.0	57 (83.8%)
>3	3	8.8	2	5.0	5 (7.3%)
	34	100	34	100	68
Chi-squared-test, P = 0.6422					

Table 3: Comparison of occurrence of TUR Syndrome

TUR Syndrome	M-TURP		B-TURP		
	No.	%	No.	%	
No	33	97.1	34	100	67 (98.5%)
Yes	1	2.9	0	0.0	1 (1.5%)
	34	100	34	100	68
Chi-squared-test, P = 0.3173					

Table 4: Comparison of urinary incontinence

Urinary Incontinence	M-TURP		B-TURP		
	No.	%	No.	%	
No	32	94.2	33	97.1	65 (95.6%)
Yes	2	5.9	1	2.9	3 (4.4%)
	34	100	34	100	68
Chi-squared-test, P = 0.5578					

Table 5: Comparison of post op hospital stay

Hospital stay	M-TURP		B-TURP		
	No.	%	No.	%	
3	8	23.5	16	47.1	24 (35.3%)
4	15	44.1	15	44.1	30 (44.1%)
5	10	29.4	2	5.9	12 (17.6%)
6	0	0.0	1	2.9	1 (1.5%)
12	1	2.9	0	0.0	1 (1.5%)
	34	100	34	100	68
Chi-squared-test, P = 0.0404*					
Mean ±SD	4.29±1.54		3.64±0.73		

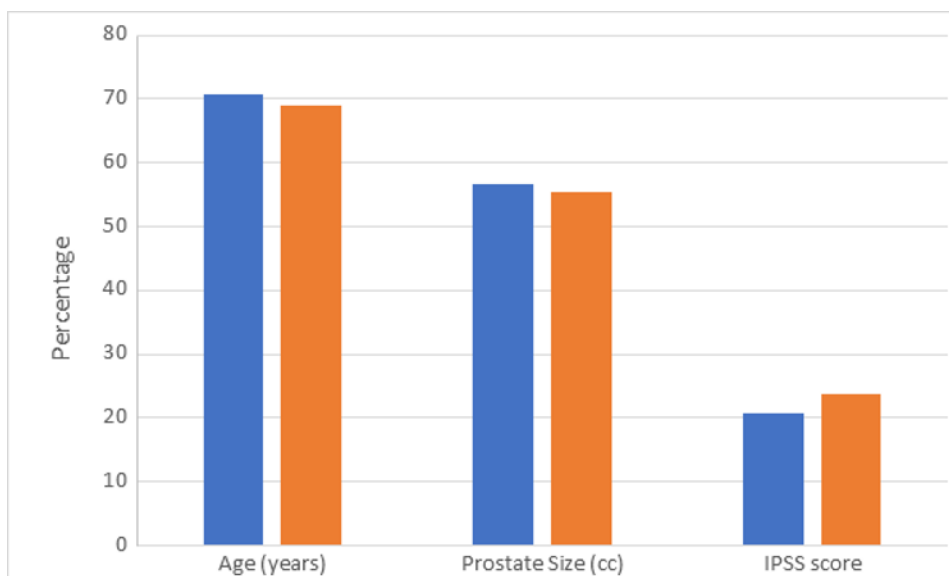


Figure 1: Comparison between age, prostate size and ipss score was done which showed no significant difference.

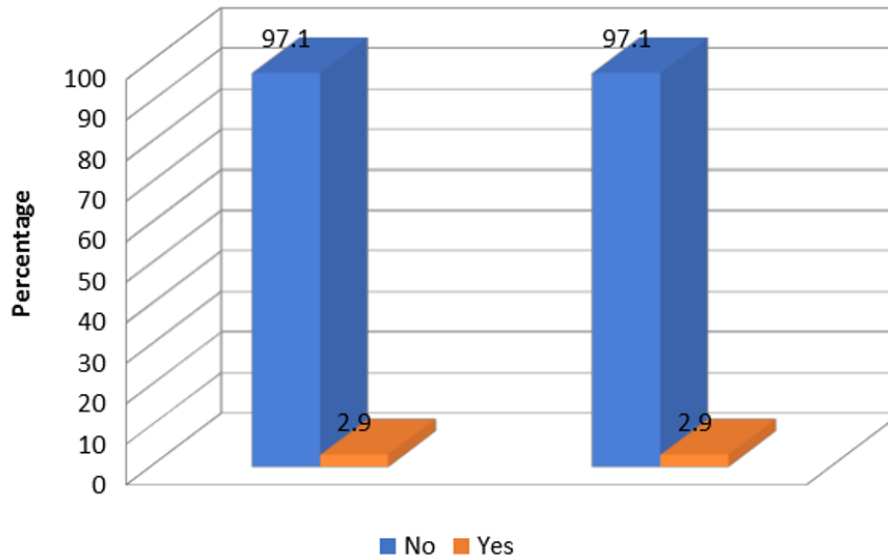


Figure 2: Comparison of Clot Retention

Discussion

For many years monopolar TURP has remained the treatment of choice for BPH. However there is a recent shift to use of bipolar resectoscope. Bipolar technology offers a new perspective in the treatment of BPH. This method uses normal saline solution 0.9%, as irrigation fluid, which has the advantage to eliminate the risk of TUR syndrome.

The present study was aimed to compare both the techniques in terms of complication rates. A total of 68 turp were formed during the study. Out of which 34 underwent resection of prostate with bipolar resectoscope and 34 by monopolar resectoscope. In this study, about more than half of the patient's belonged to the elderly group (age 71-75 years). Our findings were nearly matched with study reported by Ahmad *et al* (M-69.5±10.93, B- 69.1±11.72) who conducted a study to compare the bipolar and monopolar cautery use in TURP for treatment of enlarged prostate [1].

Mean IPSS score in our study were 20.58±7.64 and 23.70±5.20 for M-TURP and B-TURP groups respectively and these were also found quite similar to study

reported by Kozyrakis *et al* who has done a prospective study of bipolar transurethral resection of prostate comparing the efficiency and safety of the method in large and small adenomas [2].

Regarding hemoglobin level pre and post-surgical procedure we compared hemoglobin level difference with adopted procedure group. We observed Hb level difference as <1, 1-2, and >3 gm, in monopolar group were 17.6%, 73.5% and 8.8% while in bipolar group it was 0.0%, 94% and 5% respectively and Both the groups were comparable (p-value > 0.05). These findings were comparable with other studies conducted by Giulianelli *et al* [3], Yoon *et al* [4] and Kong *et al* [5] where they reported insignificant hemoglobin fall in level and decreased blood loss in BTURP.

In our study, TUR syndrome occurred in one patient (2.9%) in the M-TURP group, whereas in the B-TURP group no patients showed TUR syndrome. This result is in partial concordance with literature on the subject. In a systemic review based study of the 22 studies between 2004 and 2011 which compared M-TURP with B-TURP, not a

single instance of TUR syndrome occurred in 1401 patients of the B-TURP group, whereas in same studies, 35 cases of TUR syndrome occurred out of a total of 1375 patients who underwent M-TURP [6].

Clot retention occurred equally in 2.9% patients of the M-TURP group and B-TURP group each. The result was statistically insignificant ($P > 0.05$). The literature remains divided on the subject. Similar to our results, Lee *et al* [7] reported a clot retention rate of 10.3% in the MTURP group and 5.3% in the B-TURP group ($P = 0.389$). A meta-analysis on the subject reported 24 of 883 participants undergoing B-TURP and 51 of 880 undergoing M-TURP had clot retention with a relative risk of 0.48 (95% confidence interval [CI]: 0.30–0.77; $P = 0.002$) [6].

In our study urinary incontinence was observed in 5.9% of patients in MTURP group while in B-TURP group only 2.9% patient's had urinary incontinence complication and had statistically not significant difference ($p\text{-value} > 0.05$). Partially concordant findings were also reported in a study where they showed urinary incontinence in 4.6% and 3.9% of the patients in the monopolar and bipolar groups, respectively [1].

In our study statistically significant difference in hospital stay days was observed and was varied from 4.29 ± 1.54 to 3.64 ± 0.73 for M-TURP and B-TURP group respectively.

Our study found concordant with study done by Madduri *et al* [8] where they reported mean hospital days 3.65 ± 0.76 and 3.90 ± 0.88 days for M-TURP and B-TURP group respectively. Similarly Yoon *et al* shown, bipolar reduces the hospital stay and early catheter removal [4].

Limitations

Limitation of our study is small sample size and short follow up period.

Conclusions

Our Study demonstrates that bipolar and Monopolar transurethral resection of prostate results is comparable and both procedures are equally effective in terms of surgical outcomes and post-operative Complications. Bipolar TURP with better outcomes and improved quality of life and lesser post-operative complication, it remains Ideal treatment of choice in Benign prostatic hyperplasia but further High quality Randmised trials with adequate sample size studies are required to authenticate it's benefit.

List of Abbreviations

TURP: Transurethral resection of prostate

BPH: Benign Prostatic Hyperplasia

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