

## Original Research Article

# Bipolar versus monopolar transurethral resection for benign prostatic hypertrophy: a prospective comparative study

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**Received:** 29 March 2022

**Revised:** 11 April 2022

**Accepted:** 12 April 2022

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### ABSTRACT

**Background:** The transurethral resection of the prostate (TURP) is a well-known surgical procedure for treating benign prostatic hypertrophy in males. Monopolar TURP (MTURP) has been used in the past, however the morbidity associated with MTURP has led to the development of new surgical procedures. Energy is restricted between electrodes at the resectoscope site in bipolar TURP (BTURP), permitting the use of physiological irrigation medium. In terms of patient outcomes, there is still some doubt about the distinctions between various surgical procedures. This study aims to evaluate the efficacy of monopolar (M-TURP) and bipolar (B-TURP) TURP.

**Methods:** In this prospective comparison trial, 100 patients were enrolled and table randomized to either M-TURP or B-TURP surgery for prostatic hyperplasia. Prostate size, post-void volume and hemoglobin were recorded pre and postoperatively. Resection time was noted.

**Results:** Patients were divided into two groups, namely M-TURP and B-TURP. The mean age of patients was comparable between both groups. There is a significantly lower mean resection time in M-TURP compared to B-TURP. Drop-in hemoglobin levels (g/dl) in M-TURP patients were higher than in B-TURP. The M-TURP group showed a higher reduction in post-void residual volume than the B-TURP group. B-TURP group had a larger reduction in gland size than the M-TURP group.

**Conclusions:** M-TURP and B-TURP are safe and effective procedures for treating BPH.

**Keywords:** Benign prostatic hyperplasia, Bipolar, Monopolar, TURP

### INTRODUCTION

Benign prostatic hyperplasia is a common condition that affects men over the age of 50. Urinary urgency, frequency, nocturia, dysuria, and consequences such as urinary tract infection, bladder stones, and hydronephrosis may occur, all of which have a significant impact on one's quality of life (QOL). As a result, in order to treat BPH, fast and effective therapies are required. Conventional drug treatment does not significantly improve lower urinary tract symptoms (LUTS) in some patients with BPH, particularly patients with severe symptoms. In most cases, surgery is required

to attain satisfactory results. In recent years, minimally invasive, safe and effective methods such as monopolar TURP (M-TURP), bipolar TURP (B-TURP), greenlight photo-selective vaporization of the prostate (PVP) and holmium LASER enucleation of prostate (HOLEP) have gradually replaced traditional open surgery of prostate.<sup>1-3</sup>

The most common procedure for treating this condition is monopolar TURP (M-TURP). It is considered the gold standard for treating BPH due to its long-term efficacy. Although considerable technical advancements in recent decades have reduced the number of adverse events connected with the treatment, complications such as the

transurethral resection (TUR) syndrome, bleeding, and urethral strictures continue to be of concern.<sup>4-5</sup>

The use of bipolar technology has resulted in a substantial technical advancement in TURP in recent years. Because it may be conducted in normal saline, it's thought that with B-TURP, the dilutional hyponatremia and transurethral resection (TUR) syndrome that occur in M-TURP can be avoided.<sup>6-8</sup> B-TURP also offers the advantage of additional time to perform resection and to achieve hemostasis without compromising safety.

We examined the clinical efficacy and safety of B-TURP and M-TURP for treating elderly patients with high surgical risk in the current study.

## METHOD

This prospective hospital-based study comprised of 100 male participants reporting to the urology department of PESIMSR, Kuppam between January 2013 to May 2017 with a prior diagnosis of benign prostatic hyperplasia, which was yet to be treated. Ethical clearance was obtained from the institutional ethics committee

Patients were educated and thoroughly explained about the M-TURP and B-TURP procedures. Patient consent was taken both verbally and in writing.

### Inclusion criteria

Patients with age 45 years or more, gender-male, symptoms of BPH-related bladder outlet blockage, maximal urinary flow rate ( $Q_{max}$ ) of <15 ml/s, ultrasonography (USG) prostate volume greater than 20 g with no upper limit and medication failure to fully treat symptoms (alpha-blockers±5 alpha-reductase inhibitors), acute urinary retention failing at least one voiding free trial, recurrent gross hematuria due to prost-atomegaly, and upper urinary tract changes due to bladder outlet obstruction due to BPH were included in the study.

### Exclusion criteria

Neurovesical dysfunction, bladder calculus, carcinoma prostate, previous prostatic or urethral surgery history and urethral stricture were excluded from the study.

A convenient sample size was taken. Patients were randomly divided into 2 groups: Group 1 underwent M-TURP, while group-2 underwent B-TURP.

A thorough medical history was gathered, as well as a physical examination that included a focused neurological assessment. The following diagnostic procedures were carried out: Urinalysis (urine routine, microscopic examination, and urine culture), USG of kidney, ureter, and bladder with prostate volume and post-void residual urine measurement, uroflowmetry, serum- prostate-specific antigen (PSA), (PSA level <4

ng/ml was considered normal), urodynamic study if neuro-vesical dysfunction (e.g., diabetes) was suspected to be the cause of voiding dysfunction, hemoglobin, TLC, DLC, blood urea, serum creatinine, serum sodium, and potassium levels. BT, CT, PT-INR and blood sugar level-fasting and postprandial.

In patients who underwent M-TURP, irrigation solution was 1.5% glycine and resectoscope used was 26 Fr Karl Storz, and BPL monopolar electrocautery generator used.

B-TURP was conducted with a 26 Fr resectoscope from Karl Storz and 0.9% normal saline (NS) as an irrigation fluid, and BPL bipolar electrocautery generator was used.

The baseline characteristics and post operative outcomes were recorded, analyzed and compared.

## RESULTS

Table 1 shows the mean age of patients in both groups, which was comparable. Both groups had reduced prostatic size three months after the surgery; however, the B-TURP group had a larger reduction in gland size than M-TURP group. According to Table 1, mean resection time for the M-TURP group was considerably shorter compared to the B-TURP group. The post-void residue was considerably reduced in both groups. Drop in hemoglobin (Hb) levels (g/dl) in M-TURP patients was substantially higher than in B-TURP patients.

**Table 1: Comparison of study parameters, (n=50).**

| Parameters               | M-TURP      | B-TURP |
|--------------------------|-------------|--------|
| Mean age (years)         | 66.68       | 71     |
| Resection time (minutes) | 31.25       | 43.23  |
| Prostate size (cc)       | Presurgery  | 44.45  |
|                          | Postsurgery | 14.29  |
| Postvoid volume (ml)     | Presurgery  | 164.23 |
|                          | Postsurgery | 38.76  |
| Mean Hg level (g/dl)     | Presurgery  | 12.59  |
|                          | Postsurgery | 11.75  |

**Table 2: Compares the improvement in urinary tract symptoms.**

| Parameters                      | M-TURP      | B-TURP |
|---------------------------------|-------------|--------|
| Urinary flow rate ( $Q_{max}$ ) | Presurgery  | 9.15   |
|                                 | Postsurgery | 9.26   |
| IPSS                            | Presurgery  | 25.6   |
|                                 | Postsurgery | 8.7    |

## DISCUSSION

One of the most frequent diseases globally is benign prostatic hyperplasia (BPH). In BPH surgery, TURP is the gold standard. As a result, TURP approaches are critical. This research aims to compare bipolar (B) and monopolar (M) TURP techniques.

The patients ages (n=100) ranged from 50 to 85 years in this study, with a similar mean age of 66.68 years in the M-TURP group and 71 years in the B-TURP group. According to Shah et al between the sixth and ninth decades of life, the incidence of BPH rises gradually, reaching an all-time high of 80 percent by the age of 80. According to this study, the mean age was 64.61 years (range 42-91 years).<sup>9</sup>

The M-TURP group had a considerably shorter resection time than the B-TURP group (31.25 vs 43.23 minutes), indicating that monopolar surgery takes less time. Similar findings were obtained by Raghuvanshi et al.<sup>10</sup>

There was a marked reduction in prostate size in both modalities; however, the B-TURP group had a greater reduction in gland size than the M-TURP group (34.48 vs 30.16 cc). Raghuvanshi et al obtained similar findings.<sup>10</sup> Kumar et al observed a reduction in gland size by 27 cc in the monopolar group and 25.48 cc in the bipolar group. However, there was no significant difference in reduction between the two groups.<sup>11</sup>

There was no significant blood loss in both M-TURP and the B-TURP groups, post-surgery based on the insignificant difference in the preoperative and postoperative hemoglobin levels. Similar findings were obtained by Madduri et al.<sup>12</sup> Other studies, too, have noted a statistically insignificant blood loss between M-TURP and B-TURP.

This study found a significant decrease in the post-void volume post operatively. In addition, the M-TURP group showed a higher reduction than the B-TURP group (125.47 vs 103.13 ml).

IPSS is a good parameter to utilize as a predictor of the effectiveness of medical therapy and TURP. Therefore, it should be used in the pretreatment evaluation of all patients who present with symptoms suggestive of BPH, and their treatment mode should be determined based on IPSS results.<sup>13</sup> This study also showed a marked reduction in the IPSS score post-TURP.

## CONCLUSION

According to the findings, B-TURP and M-TURP are both safe and effective surgical treatments for BPH.

*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:** Srinivasrao P, Shashidhar M. Bipolar versus monopolar transurethral resection for benign prostatic hypertrophy: a prospective comparative study. Int Surg J 2022;9:1016-8.