International Journal of Research in Medical Sciences
Patel SK et al. Int J Res Med Sci. 2026 Feb;14(2):442-445
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20260017

Original Research Article

A comparative study of monopolar versus bipolar transurethral resection of prostate for the management of benign prostatic enlargement with particular reference to post operative complications

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Received: 25 August 2025
Revised: 05 January 2026
Accepted: 07 January 2026

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ABSTRACT

Background: Benign prostatic hyperplasia (BPH) is a very common disease seen in old age men and incidence increases with increasing age of the individual. The incidence of lower urinary tract symptoms like voiding and irritative (LUTS) secondary to BPH affects about 3% of male between 45 and 49 years of age, rising to above 30% in men over 80 years of age. Monoplar TURP (M-TURP) considered as a gold standard procedure for the resection of the prostate though bipolar TURP (B-TURP) has some benefits over the M-TURP.
Methods: 82 patients with eligible criteria sample size were taken. These patients were randomly divided into 2 groups: group 1 (41 patients) underwent M TURP, while group-2 (41 patients) underwent B-TURP.
Results: 82 patients were operated with M-TURP and B-TURP 41 patients each. Mean age of the patient was 66.4 years in M-TURP and 67.5 year in B-TURP, time of resection was more in B-TURP 51.3 min and 45.6 min in M-TURP. Residual prostate volume was less in B-TURP. PVRU improvement was more in B-TURP. Post op clot retention, TUR syndrome, mean fall in haemoglobin and blood transfusion was more in monopolar TURP.
Conclusion: B-TURP and M-TURP both procedures are good and improves lower urinary tract symptoms, although B-TURP is associated with less risk of dilutional hyponatremia, TUR syndrome, and blood loss, need of blood transfusion compared to M-TURP.

Keywords: B-TURP, M-TURP, Post void residual urine

INTRODUCTION

Benign prostatic hyperplasia (BPH) is a very common disease seen in old age men and incidence increases with increasing age of the individual. The incidence of lower urinary tract symptoms like voiding and irritative (LUTS) secondary to BPH affects about 3% of male between 45 and 49 years of age, rising to above 30% in men over 80 years of age as found by Speakman et al LUTS is often defined by international prostate symptom score (IPSS) filled out by patients, where in a score of 0 to 7 indicates mild symptoms, 8 to 19 indicates moderate symptoms, and 20 to 35 indicates severe symptoms.[1]

BPH is a quite common problem which affects health of men over age of 50. Irritative and voiding LUTS like Urinary urgency, frequency, nocturia, dysuria, straining, poor stream and complications such as urinary tract infection, bladder stones, and hydronephrosis may occur, all of these have a significant impact on one's quality of life (QOL).[2-4] As a result, in order to treat BPH, fast and effective treatment are required. Conventional specialized drug treatment does not significantly improve LUTS in some patients with BPH, particularly patients with severe LUTS symptoms. In all these most cases, surgery is required to attain satisfactory results.[5] In recent years, minimally invasive techniques, safe and effective methods

such as monopolar TURP (M-TURP), bipolar TURP (B-TURP), photo-selective vaporization of the prostate (PVP) and holmium LASER enucleation of prostate (HOLEP) have gradually replaced traditional open surgery of prostate.[6-8] Monoplar TURP considered as a gold standard procedure for the resection of the prostate though B-TURP has some benefits over the M-TURP.[7-9]

METHODS

This prospective comparative study comprised of 82 male participants reporting to the urology department MLB medical college Jhansi, Uttar Pradesh (India), from March 2024 to March 2025 presented with history of LUTS due to benign prostatic enlargement which was yet to be treated.

Mathematical tool was used to analyse the data.

Inclusion criteria

Patients with symptoms of LUTS, age 50 years or more, gender-male, serum PSA less than 4, prostate size 30 to 80 cc, and Q-max less than 15 ml/sec were included.

Exclusion criteria

Patients with urinary bladder calculus, carcinoma prostate, previous prostatic or urethral surgery history and stricture urethra, bladder dysfunction due to neurospinal cause, and Qmax more than 15 ml/sec were excluded from the study.

82 patients with eligible criteria sample size were taken. These patients were randomly divided into 2 groups: group 1 (41 patients) underwent M-TURP, while group-2 (41 patients) underwent B-TURP. A detailed history and examination was taken including frequency, urgency, nocturia, stream, post void dribbling, bothersome, quality of life, fluid intake, diabetes, any drug intake and surgical history. Examination included meatus, prepuce, urethral induration, neurospinal axis, and digital rectal examination. The following diagnostic procedures included: 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, coagulation profile and blood sugar level.

After meatal calibration use 26 Fr resectosope both monopolar and bipolar, 0.9% saline and 1.5% glycine used respectively, with proper height adjustment of irrigation column. After procedure completion use 22 Fr triway catheter with irrigation. Results were analyzed and compared.

RESULTS

In this study, 82 patients were operated with M-TURP and B-TURP 41 patients each (Table 1). Mean age of the patient was 66.4 years in M-TURP and 67.5 year in B-TURP, time of resection was more in B-TURP 51.3 min and 45.6 min in M-TURP. Residual prostate volume was less in B-TURP. PVRU improvement was more in B-TURP. Post op clot retention, TUR syndrome, mean fall in haemoglobin and blood transfusion was more in monopolar TURP (Table 2). Table 2 shows monopolar-TURP takes more time and bipolar-TURP gives better results as compared to monopolar TURP.

Table 1: Demographic of patients.

Age group (years)	Number of patients
40-50	2
50-60	10
60-70	40
>70	30

Based on the study conducted, results established include monopolar TURP leading to higher chances of need for blood transfusion as compared to B-TURP. Also, post operative fall in haemoglobin of patients, which is indicative of the amount of blood loss during procedure was found to be more in case of M-TURP as compared to B-TURP. Other post operative complications like clot retention, irritative symptoms, bladder neck contracture and stricture formation were all found to have a greater chance of occurrence in case of M-TURP as compared to B-TURP. Also, TUR syndrome risk is higher in case of M-TURP. Table 2 shows monopolar TURP is more complicated. Table 3 shows complications of monopolar and bipolar TURP.

Table 2: Comparison between monopolar and bipolar TURP.

Parameter	Monopolar TURP	Bipolar TURP
Mean age (years)	66.4	67.5
Time of resection (min)	45.6	51.3
Volume of prostate (cc)	61, 22.1	63.5, 18.5
PVRU (ml)	40.5	30.6
Duration of traction (hour)	8.5	7.8
Post op uroflowmetry improvement (ml/sec)	6.8	7.6

PVRU: Post void residual urine

Table 3: Complications of monopolar and bipolar TURP.

Complications	Monopolar TURP (%)	Bipolar TURP (%)
Post op BT	3 (7.3)	1 (2.4)
Post op average fall in Hb (gm/ml)	0.65	0.51
Post op clot retention	5 (12.1)	2 (4.8)
Post op irritative symptoms	10 (24.4)	7 (17)
TUR syndrome	3 (7.3)	1 (2.4)
Post op BNC and stricture	2 (4.8)	3 (7.3)
Re-admission	3 (7.3)	2 (4.8)
Mean catheter duration (hour)	40.5	35.6

BT: blood transfusion, BNC: bladder neck contracture

DISCUSSION

Fall in haematocrit and blood transfusion, haemorrhage is a known complication of TURP.[2] The hypothesis behind in B-TURP causing less intra- operative or postoperative haemorrhage is that in bipolar energy current move through the local tissue through tip of electrode and precise local "cut and seal "mechanism rather than the current passing through the patient's body. This in turn should be reducing the need for blood transfusion.[7-9] Studies analysed these with the outcome pointing toward B-TURP having a reduced need for blood transfusion as compared to M-TURP. In the study there is less fall in mean haemoglobin and blood transfusion in B-TURP as compare to the M-TURP.

Fagerstrom et al demonstrated a significance in re-admission after MTURP as compared to BTURP with 14 versus 5 with a $p<0.001$.[9] In the study out of 41 patients 3 patients re-admitted in M-TURP and 2 Patients re-admitted in B-polar TURP cause were failed trial of void and clot-retention.

Tefekli et al suggested the possibility of B-TURP causing higher stricture incidence in comparison to M-TURP, but this was not supported in the current review.[11] In this study in M-TURP stricture and BNC in 2 patients and in 3 patients of B-TURP after 3 months of follow up. Hueber et al compared the outcomes in 43 men 6 months postoperatively and stated that they did not find any significant difference between the two groups.[11] They found that B-TURP has significantly less reduction in serum sodium postoperatively when compared to M-TURP. Various theories have been postulated for this, one of which is that 0.9% sodium chloride is a physiological fluid and therefore causes less tissue toxicity and also helps with replacing any fluid losses. In this study found that 3 patients in M-TURP and 1 patient in B-TURP suffer with dilutional hyponatremia.

Komura et al found a statistically significant reduction in indwelling catheter duration in B-TURP arm as compared to M-TURP with 20.6 hours (SD 8.8) versus 35.8 hours (SD 54.6) (P¼ 0.042), with a significant reduction in length of stay (3.4 days versus 2.4days, P¼ 0.045).[12] In this study found that mean catheter duration was more in M-TURP as compared to B-TURP.

Limitations

This study has several limitations. It was a single-center study with a relatively limited sample size, which may affect the generalizability of the findings. The duration of follow-up was short, potentially leading to under-estimation of late complications such as urethral strictures and bladder neck contractures. Blinding was not feasible due to the nature of the surgical intervention, which may have introduced assessment bias. Surgical outcomes are influenced by operator experience, and surgeon-dependent variability could not be completely eliminated. Additionally, the lack of randomization and possible selection bias may have influenced the comparability of the two groups. The study primarily focused on early postoperative complications, and long-term functional outcomes and quality of life parameters were not comprehensively evaluated.

CONCLUSION

B-TURP and M-TURP both procedures are good and improves lower urinary tract symptoms, although B-TURP is associated with less risk of dilutional hyponatremia, TUR syndrome, and blood loss, need of blood transfusion compared to M-TURP, duration of resection is slightly more in B-TURP as compare to monopolar resection and resection of gland is slightly more in B-TURP. B-TURP is slightly better procedure than M-TURP.

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: Patel SK, Saini PK, Jain M, Satyam, Mishra A. A comparative study of monopolar versus bipolar transurethral resection of prostate for the management of benign prostatic enlargement with particular reference to post operative complications. Int J Res Med Sci 2026;14:442-5.