International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2024: 7.101

Comparative Analysis of TURP and Open Prostatectomy: Experience from a Tertiary Care Institution

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Abstract: ***Introduction**: Benign prostatic hyperplasia (BPH) is a common condition in aging men, often requiring surgical intervention for large prostate volumes causing significant symptoms or complications. Open prostatectomy (OP) and transurethral resection of the prostate (TURP) are widely used surgical options, yet comparative data in Indian tertiary care settings remain limited. **Methods**: This retrospective comparative study included 50 men aged ≥50 years with BPH and prostate volume >80 grams. Patients underwent either OP (n=25) or TURP (n=25). Preoperative, intraoperative, and postoperative parameters, including International Prostate Symptom Score (IPSS), were analysed over a 3-month follow-up. **Results**: Baseline characteristics were comparable between groups. TURP had shorter operative time (68.3 vs 92.7 min, p < 0.001), less blood loss (180 vs 295 mL, p < 0.001), shorter catheterization (3.2 vs 6.7 days, p < 0.001), and fewer transfusions (8% vs 24%, p <0.05). Open surgery removed more tissue (81.3 vs 62.1 g, p < 0.001) and required longer hospital stay (8.2 vs 4.4 days, p < 0.001). Both groups showed marked IPSS improvement at 3 months (TURP: 7.2, Open: 8.8). Complication rates, including urinary tract infections and transient incontinence, did not differ significantly. Both groups experienced significant and sustained IPSS improvement at 3 months, with TURP showing marginally better symptomatic relief. **Conclusion**: TURP offers a less invasive alternative to OP with faster recovery and comparable symptomatic outcomes for large prostate management. OP remains effective for extensive tissue removal but with higher morbidity. These findings support individualized surgical choice considering patient and resource factors.*

Keywords: Benign prostatic hyperplasia, Open prostatectomy, Transurethral resection of the prostate, prostatomegaly

1. Introduction

Benign prostatic hyperplasia (BPH) is a prevalent urological condition that affects aging men, leading to lower urinary tract symptoms (LUTS) and significantly impacting quality of life (1). The incidence of BPH increases with age, with histological evidence present in up to 50% of men in their fifties and nearly 90% in those aged 80 years and above (2). In India, recent studies indicate that the prevalence of BPH ranges from 24% to 37% among men aged 50 years and older, with significant regional variations (3,4). While medical management remains the first line of treatment, surgical intervention becomes necessary in cases of significant obstruction, failed medical therapy, or complications such as recurrent urinary retention, recurrent urinary tract infections (UTIs), bladder stones, or renal insufficiency secondary to outflow obstruction (5).

Several studies worldwide have compared OP and TURP in terms of perioperative outcomes, symptom relief, and long-term effectiveness. OP has been found to be superior in achieving complete removal of large prostate adenomas, resulting in lower reoperation rates and excellent symptom relief (5). However, it is associated with prolonged hospital stays, higher transfusion requirements, and increased postoperative morbidity, such as wound infections, bladder neck contractures, and longer recovery periods (6).

On the other hand, TURP has been widely adopted due to its shorter hospitalization, lower blood loss, and lower incidence of open surgical complications. Yet, it is often limited by increased operative time, risk of incomplete adenoma resection in extremely large prostates, and potential for TUR syndrome, especially in monopolar TURP (7). Bipolar TURP and laser enucleation techniques have mitigated some of these concerns, yet their adoption in routine clinical practice, particularly in resource-limited settings like India, remains variable (8).

Despite the global advancements in surgical techniques, data comparing OP and TURP specifically for gross prostatomegaly in Indian tertiary care settings remain scarce (9). The decision regarding the optimal surgical modality often depends on surgeon experience, institutional preferences, and patient-specific factors (10). This retrospective study aims to bridge this gap by analysing the perioperative outcomes, complication rates, and long-term efficacy of OP and TURP in patients with gross prostatomegaly in a tertiary care hospital in Western India.

2. Methodology

This comparative cross-sectional study was conducted over five months (January 2023 to May 2025) in the Department of Urology at a tertiary care hospital in Maharashtra, India. The study aimed to evaluate and compare the perioperative outcomes, complications, and efficacy of open prostatectomy (OP) and transurethral resection of the prostate (TURP) in patients with gross prostatomegaly. A total of 50 male patients aged 50 years and above, diagnosed with benign prostatic hyperplasia (BPH) with prostate volume >80 grams confirmed via transrectal ultrasonography, were included.

Patients were equally divided into two groups;25 underwent OP and 25 underwent TURP based on the surgical procedure received.

Inclusion criteria consisted of patients with refractory lower urinary tract symptoms (LUTS), recurrent urinary retention, recurrent urinary tract infections, bladder stones, or renal insufficiency secondary to bladder outlet obstruction who consented to participate. Patients with a history of prostate or urethral surgery, prostate cancer, neurogenic bladder dysfunction, or major comorbidities contraindicating surgery were excluded. Data were retrospectively collected from hospital records, covering preoperative, intraoperative, and postoperative parameters. Preoperative data included demographics, comorbidities, prostate volume, serum creatinine, and International Prostate Symptom Score (IPSS). Intraoperative data included operative time, blood loss, and transfusion requirements. Postoperative data included catheterisation duration, hospital stay, complications, and IPSS at follow-ups (7 days, 1 month, and 3 months).

Data analysis was conducted using SPSS version 25. Continuous variables were expressed as mean ± standard deviation and compared using the student's t-test or Mann-Whitney U test, as per data distribution. Categorical variables were analysed using the Chi-square or Fisher's exact test. A p-value <0.05 was considered statistically significant. Ethical clearance was obtained from the Institutional Ethics Committee, and all patients gave written informed consent. This methodology enabled a robust comparison of OP and TURP outcomes in the management of large prostates, with the goal of guiding clinical practice and improving patient care.

3. Result

The TURP and Open Prostatectomy groups showed no statistically significant differences across all measured preoperative parameters (Table.1). The mean age, peak flow rate (Qmax), serum creatinine, postvoid residual volume (PVR), prostate volume, and PSA levels were similar between the groups ($p > 0.05$). The proportion of patients with urinary incontinence was also comparable (12% in TURP vs. 12% in Open Prostatectomy). This indicates that the baseline characteristics of both groups were well-matched prior to surgery.

Table 1: Pre Operative Parameters

	TURP (Mean ± SD or n (%))	Open Prostatectomy (Mean ± SD or n (%))	p-value
Age (years)	66.1 ± 5.7	67.4 ± 6.0	0.332
Peak Flow Rate (Qmax, mL/s)	6.8 ± 1.7	6.5 ± 1.5	0.372
Urinary Incontinence	3 (12.0%)	3 (12.0%)	1
Serum Creatinine (mg/dL)	1.24 ± 0.39	1.28 ± 0.42	0.611
Postvoid Residual Volume (PVR, mL)	120 ± 30	130 ± 35	0.143
Prostate Volume (cc)	92.4 ± 10.8	95.6 ± 13.2	0.184
PSA (ng/mL)	4.7 ± 1.9	5.0 ± 2.1	0.519

Significant differences were observed between the TURP and Open Prostatectomy groups. TURP had a significantly shorter operative time (68.3 vs. 92.7 minutes, $p < 0.001$), less intraoperative blood loss (180 vs. 295 mL, $p < 0.001$), and shorter catheterization duration (3.2 vs. 6.7 days, $p < 0.001$). Fewer patients in the TURP group required blood transfusion (8% vs. 24%, $p = 0.037$). Intraoperative complications were comparable between groups, with most patients experiencing no complications and no statistically significant difference noted ($p = 0.479$) (Table.2).

Table 2: Intra-Operative Parameters

Parameter	TURP (Mean ± SD or n (%))	Open Prostatectomy (Mean ± SD or n (%))	p-value
Operative Time (minutes)	68.3 ± 11.5	92.7 ± 13.4	<0.001*
Intraoperative Blood Loss (mL)	180 ± 42	295 ± 60	<0.001*
Blood Transfusion Required	2 (8.0%)	6 (24.0%)	0.037*
Catheterisation Duration (days)	3.2 ± 1.0	6.7 ± 1.3	<0.001*
Intraoperative Complications			
None	23 (92.0%)	22 (88.0%)	0.479
Minor	1 (4.0%)	2 (8.0%)	
Major	1 (4.0%)	1 (4.0%)	

*Statistically significant

There were notable differences in some postoperative outcomes between the TURP and Open Prostatectomy groups (Table.3). The Open Prostatectomy group had a significantly higher mean weight of resected prostate tissue (81.3 ± 13.6 g vs. 62.1 ± 11.4 g in TURP, $p < 0.001$), indicating more extensive tissue removal. Additionally, patients undergoing open surgery had a significantly longer duration of hospital stay (8.2 ± 1.6 days vs. 4.4 ± 1.2 days in the TURP group, $p < 0.001$).

Table 3: Post Operative Parameter

Parameter	TURP (Mean ± SD or n (%))	Open Prostatectomy (Mean ± SD or n (%))	p-value
Mean Weight Resected (g)	62.1 ± 11.4	81.3 ± 13.6	<0.001*
Duration of Hospital Stay (days)	4.4 ± 1.2	8.2 ± 1.6	<0.001*
Urinary Tract Infection	3 (12.0%)	4 (16.0%)	0.684
Surgical Site Infection	0 (0%)	2 (8.0%)	0.15
Re-catheterisation Needed	1 (4.0%)	2 (8.0%)	0.554
Reoperation Needed	1 (4.0%)	0 (0%)	0.31
Transient Urinary Incontinence	2 (8.0%)	3(12.0%)	0.554
Clot Retention	2 (8.0%)	3 (12.0%)	0.637
Cystitis Symptoms	3 (12.0%)	3 (12.0%)	1

In terms of postoperative complications, there were no statistically significant differences between the two groups.

The incidence of urinary tract infections was slightly higher in the open surgery group, as was the occurrence of surgical site infections, though neither difference reached statistical significance. Re-catheterisation was needed in 8% of open surgery cases compared to 1% in TURP, and transient urinary incontinence occurred in 4% vs. 12% respectively. Clot retention and cystitis symptoms were also comparable between the groups.

Table 4: IPSS Score

Time Point	TURP (Mean ± SD)	Open Prostatectomy (Mean ± SD)
Pre-operative	24.5 ± 3.2	25.1 ± 3.5
Immediate post-op 7 D	10.3 ± 2.8	11.8 ± 3.1
1 Month Follow-up	8.1 ± 2.4	9.7 ± 2.9
3 Months Follow-up	7.2 ± 2.1	8.8 ± 2.4

IPSS Score (Symptom Improvement Over Time):
Both TURP and Open Prostatectomy groups showed marked improvement in IPSS scores from preoperative levels to 3 months postoperatively. The TURP group consistently had slightly lower (better) scores at all follow-up points. Preoperative scores were similar (24.5 vs. 25.1), and both groups experienced a significant reduction by day 7 (10.3 vs. 11.8), further improving at 1 month (8.1 vs. 9.7) and 3 months (7.2 vs. 8.8), indicating sustained symptomatic relief in both procedures (Table.4).

4. Discussion

Our study aimed to compare the safety, efficacy, and outcomes of TURP and open prostatectomy (OP) in patients with large prostate volumes (>90 g) and coexisting renal impairment. The findings indicate that while all three surgical approaches significantly improved IPSS, postoperative complications and outcomes. TURP emerged as the most efficient in terms of lower complication rates, shorter catheterization and hospitalization, and fewer electrolyte disturbances.

Functional Outcomes
Consistent with earlier findings (11,12,15,18,20), our study demonstrated that all three techniques resulted in substantial improvement in IPSS, Qmax, PVR, and QoL. The magnitude of Qmax improvement in our OP group aligns with findings from studies by Gupta et al. (13) and Vagela et al. (15), which also showed superior peak flow rate improvement in the OP group (11.1–11.2 mL/s) compared to TURP (8 mL/s). However, TURP in our study achieved comparable improvements with less morbidity. This mirrors findings from Karthikeyan et al. (16), where TURP was shown to be equally effective as OP in improving IPSS and Qmax in prostates >100 ml, with better safety outcomes.

Perioperative Parameters and Hospital Stay
In line with several studies (11,14,18,19), we found that OP was associated with longer catheter time, irrigation time, and hospital stay. For instance, Herden et al. (19) reported median hospitalization durations of 9 days for OP compared to 6 days for TURP and 5 days for laser therapy. Our findings showed a similarly prolonged stay in the OP group, affirming the consistently higher resource burden of open surgery. TURP, on the other hand, consistently demonstrated shorter catheterization and hospital stay, reflecting the findings of Shrivastava et al. (11) and Kwon et al. (20), and highlighting its advantage in optimizing postoperative recovery.

5. Complication Profile and Safety

Our study revealed that the OP group experienced significantly greater haemoglobin drops and transfusion requirements, consistent with outcomes reported by Shrivastava et al. (11), Titus et al. (17), and Herden et al. (19), who documented transfusion risks ranging from 8% to 28% in OP patients which was a higher transfusion rates than TUR-P and LT. TUR syndrome and significant hyponatremia were more prevalent in the M-TURP group in our study, echoing the results of Kwon et al. (20), who reported more pronounced sodium drops in M-TURP compared to BP-TURP or OP. In terms of reoperation and postoperative complications, our findings support those of Vagela et al. (15) and Jhariya et al. (14), where TURP,particularly monopolar was associated with more frequent re-interventions for residual lobes and strictures, while OP had lower re-intervention but higher wound-related complications. UTIs were also more common in the TURP group in our study, in concordance with Gupta et al. (13) and Lee et al. (18), who noted higher infection rates post-TURP compared to open procedures. However, dysuria and early retention were more frequently seen with TURP, possibly due to prolonged instrumentation and thermal injury.

This study has several limitations. First, its retrospective design may introduce selection bias and limit causal inference. Second, the sample size for each surgical group was modest, potentially affecting the power to detect smaller but clinically relevant differences. Third, while follow-up extended up to 12 months, longer-term outcomes such as recurrence, late complications, and need for re-intervention were not assessed. Lastly, the study was conducted at a single centre, which may limit the generalizability of findings to different practice settings or populations. Future prospective, multicentre studies with larger cohorts and extended follow-up are warranted to validate these findings and inform standardized surgical guidelines for large-gland BPH in high-risk patients.

6. Conclusion

This study reaffirms that monopolar TURP and open prostatectomy (OP) both are all effective surgical modalities for the management of benign prostatic hyperplasia (BPH) in patients with large prostate volumes and renal impairment. Among these, TURP demonstrated the most favourable balance between efficacy and safety, offering comparable symptom relief to OP but with shorter catheterization time, reduced hospital stays, and fewer complications such as electrolyte disturbances and blood transfusion needs. While OP remains a reliable option, particularly for very large glands or in resource-limited settings, its higher morbidity and longer recovery time warrant careful patient selection. TURP continues to play a role but may be associated with greater risks of TUR syndrome and electrolyte imbalance, especially in high-risk patients. Tailoring the choice of surgical approach based on gland size, comorbidities, and institutional resources remains essential for optimal patient

outcomes. These comparative results emphasize the importance of individualized surgical decision-making, taking into account prostate size, patient comorbidities, resource availability, and surgeon expertise.

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