

## Archives of Urology and Nephrology

### Research Article

# Impact of Transurethral Resection of The Prostate (TURP) On Urodynamic Parameters in a Developing Country

Frantz Guy Epoupa Ngalle<sup>1\*</sup>, Axel Stephane Nwaha Makon<sup>1</sup>, Armel Quentin Essomba<sup>2</sup>, Darly Sorelle Yreen Bessala<sup>2</sup>, Jonathan Essoh<sup>1</sup>, Moby Mpah Edouard Herve<sup>2</sup>

<sup>1</sup>Faculty of Medicine and Biomedical Sciences, University of Yaounde I, Yaounde-00237, Cameroon

<sup>2</sup>Faculty of Medicine and Pharmaceutical Sciences, University of Douala, Douala-456, Cameroon

**\*Corresponding Author:** Frantz Guy Epoupa Ngalle, Faculty of Medicine and Biomedical Sciences, University of Yaounde I, Yaounde-00237, Cameroon

**Received Date:** 10 July 2025; **Accepted Date:** 30 July 2025; **Published Date:** 01 August 2025

**Copyright:** © 2025 Frantz Guy Epoupa Ngalle, this is an open-access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

### Abstract

**Introduction:** Benign prostatic hyperplasia (BPH) causes bladder outlet obstruction (BOO) and lower urinary tract symptoms (LUTS), significantly impacting quality of life. Transurethral resection of the prostate (TURP) is the standard treatment, but its impact in Cameroon remains underexplored.

**Methods:** A retrospective study analyzed the records of patients who underwent TURP between 2018 and 2023 in two referral hospitals in Douala. Statistical analysis compared pre- and post-TURP data using a paired t-test ( $p < 0.05$ ).

**Results:** TURP accounted for 33.19% of surgical interventions, with the majority performed at Douala General Hospital (62.96%). The mean patient age was 67.1 years. Postoperatively, the maximum urinary flow rate increased from 11.09 to 18.00 ml/s ( $p < 0.002$ ), and 71.6% of patients had an IPSS score  $\leq 7$ . The complication rate was low (2.46%), mainly moderate hemorrhages.

**Conclusion:** TURP significantly improves urinary parameters and quality of life with minimal complications, reinforcing its role as the standard treatment.

**Keywords:** Benign prostatic hyperplasia, Transurethral resection of the prostate, Urodynamic parameters, Douala

### Introduction

Benign prostatic hyperplasia (BPH), formerly known as prostate adenoma, is a common condition in aging men. Histologically, it is defined by stromal and epithelial proliferation primarily affecting the transition zone and the periurethral region of the prostate. This condition represents a major public health concern due to its high prevalence: it affects approximately 50% of men at age 60 and up to 90% at age 85, according to global epidemiological data [1]. In Africa, a study conducted in 2017 estimated its prevalence at 23.7% [2]. The increase in prostate volume secondary to BPH can lead

to dynamic or static bladder outlet obstruction (BOO), which is the primary cause of lower urinary tract symptoms (LUTS), also referred to as lower urinary tract symptoms (LUTS) [3]. These symptoms, classified into storage, voiding, and post-micturition phases, have a significant impact on patients' quality of life. Therefore, the International Continence Society (ICS) systematically recommends uroflowmetry for the initial evaluation and follow-up of BPH [4]. From a therapeutic perspective, transurethral resection of the prostate (TURP) is the gold-standard surgical inter-

vention for managing symptomatic BPH. As an alternative to open surgery, it is widely favored due to its effectiveness in improving symptom scores, urinary flow rate, and its low long-term retreatment rate [5].

The significance of this procedure is reflected in its high utilization rate across various countries. In France, between 2010 and 2016, 318,549 men underwent prostate deobstruction surgery for LUTS related to BPH [6]. In Canada, TURP accounts for 92.6% of all prostate surgeries [7]. In Africa, its adoption varies: in Mali, a study conducted at CHU Pr BSS in Kati reported an 80% hospital frequency of TURP for BPH, while in Cameroon, available data indicate that TURP represents 46.5% of endoscopic urological procedures, with BPH being the primary indication (39.95%) [8,9].

Assessing postoperative outcomes of TURP is essential to optimizing patient management. Numerous studies have demonstrated significant improvements in functional, clinical, and urodynamic urinary parameters following this procedure. For example, in Japan, Takahiko M. et al. observed in 2012 an improvement in LUTS, the International Prostate Symptom Score (IPSS), and uroflowmetry parameters one year after TURP [10]. Similarly, a 2023 study in India involving 54 patients reported an increase in both maximum and average urinary flow rates in all operated patients [11]. In Africa, comparable results have been found: a study by Ouédraogo et al. in 2018 in Burkina Faso showed a 106.25% increase in maximum urinary flow rate, accompanied by a significant improvement in the IPSS score [12]. In Mali, Ibrahim Salif reported in 2021 an increase in average urinary flow rate from 11.1 ml/s to 18.7 ml/s after TURP [13].

However, despite numerous international and African studies, Cameroonian data on the impact of TURP on urodynamic parameters remain limited. In this context, our study aims to evaluate changes in clinical and paraclinical urinary parameters following TURP in Cameroon. A better understanding of these outcomes will help improve management protocols and adapt therapeutic strategies to the local population.

## Methodology

This is a retrospective analytical cross-sectional study based on the review of medical records of patients who underwent transurethral resection of the prostate (TURP) for symptomatic benign prostatic hyperplasia (BPH). The study was conducted in the urology departments of Douala General Hospital (HGD) and Laquintinie Hospital of Douala (HLD), selected for their capability to perform TURP and their role as referral centers in urology within the region.

The study period covered the medical records of patients who underwent surgery between January 1, 2018, and December 31, 2023, with data collection and analysis conducted from November 2023 to May 2024.

The study population exclusively included the medical records of patients who underwent TURP for BPH, with in-

clusion criteria requiring the availability of IPSS scores and systematic pre- and post-operative uroflowmetry data. Incomplete records regarding these parameters were excluded. Recruitment was consecutive, ensuring a representative selection of clinical practices.

Data were collected both manually and digitally from hospital records and recorded in a standardized file including the following variables: demographic data (age, marital status), urodynamic parameters (maximum urinary flow rate, voided volume, voiding time), IPSS score (pre- and post-operative), and postoperative voiding satisfaction.

Statistical analysis considered these data, particularly for comparisons of IPSS scores and uroflowmetry parameters before and after TURP, with a significance threshold set at  $p < 0.05$ .

## Results and Discussion

Despite the rise of minimally invasive surgical techniques in the management of benign prostatic hyperplasia (BPH), transurethral resection of the prostate (TURP) remains the gold standard treatment worldwide. In this study, the hospital frequency of TURP was 33.19%, with a predominance of procedures performed at Douala General Hospital (62.96%) compared to Laquintinie Hospital of Douala (37.04%).

The mean age of operated patients was  $67.11 \pm 8.36$  years (range: 49–88 years), which is consistent with the data from Ndiath et al. (2021, Senegal), reporting a mean age of 67.3 years among patients operated on at Aristide Le Dantec Hospital [14]. The predominant age group was 60–70 years (44.44%), a distribution similar to that described by Mubenga et al. (2018, DR Congo), who reported a prevalence of 58.5% among patients aged 50–69 years [15]. These observations support the well-established evidence that BPH is a prevalent condition in aging men, with its frequency increasing exponentially with advancing age.

Dysuria was the primary reason for consultation (58.02%), a result comparable to those reported by Ondongo et al. (58.5%, DR Congo) and Diakité et al. (38.5%, Mali) [16,17]. Pollakiuria was the second most frequent complaint (22.22%), though its prevalence was lower than that reported by Diakité et al. (32.3%) [17]. The duration of urinary symptoms exceeded one year in 66.67% of cases, a trend consistent with Mubenga et al., who reported an average symptom duration of  $4.11 \pm 3.1$  years [15].

Among associated comorbidities, hypertension (17.28%) and type 2 diabetes (11.11%) were the most common, although their prevalence was lower than that reported by Mukala et al. (42% and 41%, DR Congo) [18]. Several studies, including those by Protopsaltis et al. and Kwon H et al., suggest that diabetes is an independent risk factor for BPH, influencing disease progression through mechanisms involving bladder dysfunction and alterations in the prostatic microenvironment [19,20].

In this study, 83.95% of patients had a PSA level <4 ng/mL, a slightly higher frequency compared to Ondongo et al. (65%, DR Congo) and Diakité et al. (73%, Mali). The cytobacteriological examination of urine (ECBU) was positive in 12.35% of patients, with *Escherichia coli* identified in 90% of cases, which aligns with the findings of Ondongo et al. (66%) and Diakité et al. (53.3%) [16,17].

Preoperative uroflowmetry revealed an average maximum urinary flow rate (Qmax) of  $11.09 \pm 3.47$  ml/s, a result similar to the  $13.45 \pm 2.45$  ml/s reported by Mobassher et al. (Pakistan) but higher than the  $6.5 \pm 1.72$  ml/s found by Bansal N. et al. (India), where patients exhibited more severe symptoms. In this study, 83.95% of patients had a PSA level <4 ng/mL, a slightly higher frequency compared to Ondongo et al. (65%, DR Congo) and Diakité et al. (73%, Mali). The cytobacteriological examination of urine (ECBU) was positive in 12.35% of patients, with *Escherichia coli* identified in 90% of cases, which aligns with the findings of Ondongo et al. (66%) and Diakité et al. (53.3%) [16,17].

Preoperative uroflowmetry revealed an average maximum urinary flow rate (Qmax) of  $11.09 \pm 3.47$  ml/s, a result similar to the  $13.45 \pm 2.45$  ml/s reported by Mobassher et al. (Pakistan) but higher than the  $6.5 \pm 1.72$  ml/s found by Bansal N. et al. (India), where patients exhibited more severe symptoms.

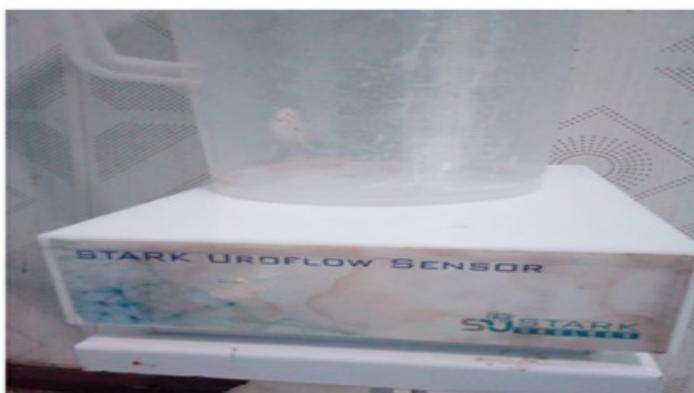
The main surgical indications were moderate lower urinary tract symptoms (LUTS) resistant to medical treatment (37.04%) and acute urinary retention (32.10%). Spinal anesthesia was preferred in 95.06% of cases, in accordance with international recommendations, as it provides better postoperative analgesia and allows for early detection of TURP syndrome [23].

Regarding postoperative management, 67.9% of patients received bladder irrigation for 48 hours, and the urinary catheter was removed on the third day in 67.9% of cases, results comparable to those of Diallo et al [24]. The complication rate was 2.46%, mainly consisting of moderate postoperative bleeding, a rate lower than the 5.12% reported by Avion KP et al [25].

The improvement in urinary symptoms was significant ( $p < 0.002$ ), with 71.6% of patients having an IPSS score  $\leq 7$  after TURP, compared to 0% preoperatively. A strong correlation was observed between the improvement in urinary flow and the reduction of obstructive symptoms ( $p = 0.005$ ), reinforcing the effectiveness of TURP in improving Qmax and IPSS scores [22]. In terms of postoperative urinary satisfaction, 86.42% of patients reported an improvement in their urinary quality of life, while 13.58% remained dissatisfied. These results are slightly lower than those of Rehman et al. (Pakistan, 93.62% satisfaction), probably due to a delayed diagnosis and advanced bladder deterioration in some patients. The improvement in urinary symptoms was significant ( $p < 0.002$ ), with 71.6% of patients having an IPSS score  $\leq 7$  after TURP, compared to 0% preoperatively. A strong correlation was observed between the improvement in urinary flow and the reduction of obstructive symptoms ( $p = 0.005$ ), reinforcing the effectiveness of TURP in improving Qmax and IPSS scores. In terms of postoperative urinary satisfaction, 86.42% of patients reported an improvement in their urinary quality of life, while 13.58% remained dissatisfied. These results are slightly lower than those of Rehman et al. (Pakistan, 93.62% satisfaction), probably due to a delayed diagnosis and advanced bladder deterioration in some patients [26].



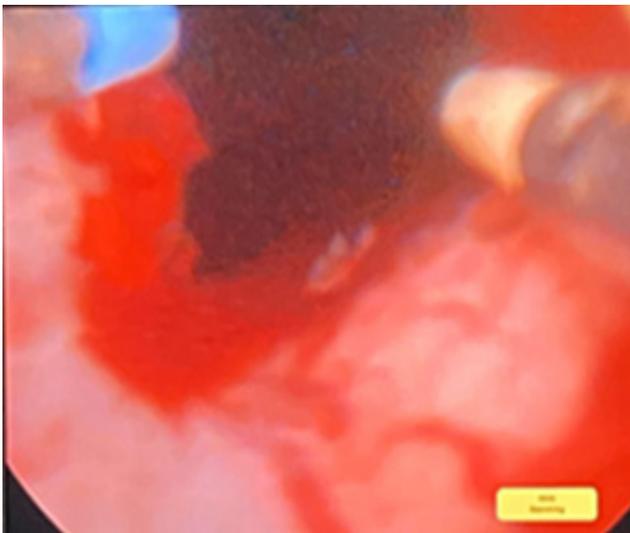
**Figure1:** Overview of a Surgeon Performing Transurethral Resection of the Prostate (TURP): Intraoperative Scene



**Figure2:** Urodynamic measurement device



**Figure3:** Initial Endoscopic View During Transurethral Resection of the Prostate



**Figure4:** Endoscopic View of Transurethral Resection of the Prostate (TURP) at the End of Resection

## Conclusion

The results of this study further corroborate the proven effectiveness of transurethral resection of the prostate (TURP) as the gold-standard therapeutic option in the surgical management of symptomatic benign prostatic hyperplasia (BPH). This intervention demonstrated a significant improvement in urodynamic parameters, particularly the increase in maximal urinary flow rate, a key indicator of relief from subvesical obstruction. Furthermore, the reduction in the IPSS score reflects a notable alleviation of lower urinary tract symptoms (LUTS), thus contributing to optimized urinary comfort for the operated patients.

Additionally, the analysis of postoperative outcomes confirms a low complication rate, in line with international standards in endoscopic prostate surgery. The reduced prevalence of

adverse effects, such as postoperative hemorrhage or the persistence of urinary disturbances post-surgery, underscores the increased safety of this technique. These results align with data from the scientific literature, reinforcing TURP as the gold standard therapeutic approach for patients with symptomatic BPH refractory to medical treatment.

Moreover, the evaluation of postoperative satisfaction reveals a predominantly positive perception from patients, reflecting a direct impact on their quality of life. The improvement in functional urinary parameters, coupled with a reduction in episodes of acute urinary retention and faster recovery of micturition capabilities, illustrates the relevance of this approach in a modern clinical context.

Thus, TURP remains an indispensable therapeutic modality, combining clinical efficacy, perioperative safety, and lasting functional benefit. However, the persistence of symptoms in a minority of patients invites further research into predictive profiles for postoperative response and strategies for optimizing long-term follow-up care.

## References

1. KA O, Jalloh M., Mukeshimana A, Ngom Gueye N, Gueye S.M. Evaluation of Knowledge of Benign Prostatic Hyperplasia in Senegalese Men Aged 60 and Over at the Geriatric Center of Ouakam. *Uro'Andro.* 2020;2(2):68-69.
2. Ojewola, R. W., E. S. Oridota, O. S. Balogun, T. O. Alabi, A. I. Ajayi, T. A. Olajide, K. H. Tijani, E. A. Jeje, M. A. Ogunjimi, and E. O. Ogundare. "Prevalence of clinical benign prostatic hyperplasia amongst community-dwelling men in a South-Western Nigerian rural setting: A cross-sectional study." *African Journal of Urology* 23, no. 2 (2017): 109-115.
3. Laalj Omar. *Advances and New Developments in the Treatment of Benign Prostatic Hyperplasia (Literature Review)* [Doctoral Thesis]: Sidi Mohammed Ben Abdellah University; 2015.
4. Djavan B, Bostanci Y, Kazzazi A. Surgical Treatment of Benign Prostatic Hyperplasia: Bipolar Resection and Laser Treatment. In: *Encyclo Méd Chir, Surgical Techniques* [Article 41-273-M], 2013.
5. Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U, et al. The Standardization of Terminology of Lower Urinary Tract Function: Report from the Standardization Sub-committee of the International Continence Society. *Neurourol Urodyn.* 2002;21:167-178.
6. Descazeaud A., Robert G., Delongchamps N. B., Cornu J.-N., Saussine C., Haillot O., et al. Initial Assessment and Follow-up of Benign Prostatic Hyperplasia: Literature Review from the CTMH of the AFU. *Progrès En Urologie.* 2012;22(1):1-6.
7. Ghazzi, S., J. Ghorbel, M. Ben Ali, M. Dridi, J. Maarouf, R. Khari, and N. Ben Rais. "Bipolar versus monopolar transurethral resection of the prostate: a prospective randomized study." *Progress in Urology* 24, no. 2 (2014): 121-126.

8. L Gury, G Robert, H Bensadoun. Current State of Ambulatory Surgery for Subvesical Obstruction: The Laser Effect? *Progrès en Urologie*. 2018;28(10):509-551.
9. Delongchamps, NB., G. Robert, A. Descazeaud, JN. Cornu, AR. Azzouzi, O. Haillot, M. Devonec et al. "Treatment of benign prostatic hyperplasia by electrical endoscopic techniques and upper adenectomy: literature review from the CTMH of the AFU." *Progress in Urology* 22, no. 2 (2012): 73-79.
10. Albacaye Sember. Transurethral Resection of the Prostate at the Urology Department of CHU Pr BSS of KATI [Doctoral Thesis]. Bamako, Mali: University of Science, Technology and Technology of Bamako; 2021.
11. Ngalle, FG Epoupa, AS Nwaha Makon, J. Nsangou Mouliom, L. O. Mbouché, J. C. Fouda, A. A. Mbassi, JB Mekeme Mekeme, EH Moby Mpah, and P. J. Fouda<sup>2</sup>. "Assessment of the rate of practice of endoscopic urological surgery in three selected healthcare facilities in Douala, Cameroon." *African Urology* 3, no. 1 (2023): 31-34.
12. Mitsui, Takahiko, Hiroshi Tanaka, Toru Harabayashi, Kimihiko Moriya, Satoru Maruyama, Takashige Abe, Ataru Sazawa, Nobuo Shinohara, and Katsuya Nonomura. "Changes in urodynamics and lower urinary tract symptoms after radical prostatectomy: implications of preoperative detrusor contractility." *LUTS: Lower Urinary Tract Symptoms* 4, no. 2 (2012): 82-86.
13. Bansal N, Adiga P. Comparative Study of Uroflowmetry Parameters Pre and Post TURP in Benign Prostatic Hyperplasia. *J Urol Dis* 08. 1314. DOI: 10.290011/2575-7903.001314.
14. Ndiath A, et al. Study of Functional Results of Transurethral Resection of the Prostate at Aristide Le Dantec Hospital. *Rev Afr Urol*. 2021;27(3):45-52.
15. Mubenga S, et al. Clinical Profile and Surgical Management of BPH in the Democratic Republic of Congo. *Afr J Urol*. 2018;24(2):78-85.
16. Ondongo F, et al. Prevalence of Urinary Disorders Related to BPH in the Democratic Republic of Congo. *Uro Afr*. 2020;15(4):112-120.
17. Diakité B, et al. Analysis of Urinary Symptoms and Management of BPH in Mali. *J Urol Afr*. 2019;12(1):27-33.
18. Mukala A, et al. Risk Factors Associated with BPH in Sub-Saharan Africa. *J Androl*. 2021;8(2):35-41.
19. Protosaltis I, et al. Diabetes Mellitus as a Risk Factor for BPH. *Urology*. 2018;112(6):12-19.
20. Kwon H, et al. Impact of Diabetes on the Progression of Benign Prostatic Hyperplasia. *Asian J Androl*. 2017;19(3):405-409.
21. Mobassher A, et al. Preoperative and Postoperative Uroflowmetry in Patients Undergoing Transurethral Resection of the Prostate. *Pak J Med Sci*. 2015;31(3):591-594.
22. Bansal N, et al. Uroflowmetry in Benign Prostatic Hyperplasia: A Study in a Rural Hospital. *Int J Med Res Rev*. 2016;4(4):586-590.
23. Wk, Mebust. "Transurethral prostatectomy: immediate and postoperative complications. A cooperative study of 13 participating institutions evaluating 3,885 patients." *J Urol* 141 (1989): 243-247.
24. Diallo AB, et al. Morbidity and Mortality of Transurethral Resection of the Prostate at CHU Conakry. *Prog Urol*. 2011;21(12):851-855.
25. Avion KP, et al. Perioperative and Postoperative Complications of Transurethral Resection of the Prostate: Experience from the Libreville Hospital. *Afr J Urol*. 2017;23(2):124-129.
26. Rehman A, et al. Patient Satisfaction After Transurethral Resection of the Prostate Assessed by International Prostate Symptom Score. *J Ayub Med Coll Abbottabad*. 2010;22(1):23-25.

**Citation:** Frantz Guy Epoupa Ngalle, et.al. Impact of Transurethral Resection of The Prostate (TURP) On Urodynamic Parameters in a Developing Country. *Arch. Urol. Nephrol*. Vol. 4, Iss. 1, (2025). DOI: 10.58489/2836-5828/010