

## Complications Following Transurethral Resection of the Prostate: A Retrospective Study

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### ABSTRACT

**Background:** Benign prostatic hyperplasia (BPH) is a non-malignant proliferation of periurethral prostatic tissue commonly seen in aging men, often causing lower urinary tract symptoms (LUTS).

**Aim:** to assess intraoperative and postoperative complications of TURP in Bujumbura.

**Materials and Methods:** A retrospective study was conducted over 30 months (Jan 2020 – June 2022), including all patients who underwent TURP for BPH at two hospitals in Bujumbura. Only complete medical records were included. Data were analyzed using Epi Info 7.2.2.6.

**Results:** Out of 143 prostate surgeries, 118 (82.5%) were TURPs. Mean age was 70.7 years (range: 51–90). Main symptoms: urinary retention (39%), frequency (28.8%), and dysuria (28%). Benign prostate was suspected in 87.3% on DRE; PSA <4 ng/ml in 66.9%. Prostate volume was 30–60 g in 60.2%. Only 29.7% had prior medical therapy. Catheter-dependent retention was the leading surgical indication (38.1%). Intraoperative complications occurred in 2.5%: capsular perforation (1.7%) and bulbar urethral injury (0.8%). Early postoperative complications: bladder spasms (10.2%), retention after catheter removal (6.8%), UTI (3.4%), and hematuria from eschar sloughing (1.7%). Average hospital stay was 5.1 days; catheterization duration was 2.95 days. Late complications: retrograde ejaculation (53.4%), recurrent LUTS (3.4%), urethral stricture (1.7%), prostatic fossa sclerosis (0.8%), bladder neck sclerosis (0.8%), and incontinence (0.8%).

**Conclusion:** TURP is safe and effective for BPH in Burundi. Despite low complication rates, adequate technical expertise and close postoperative monitoring are essential to reduce risks and improve outcomes.

### Keywords

TURP, Complications, Benign prostatic hyperplasia, Lower urinary tract symptoms.

### Introduction

Benign prostatic hyperplasia (BPH), also known as benign prostatic hypertrophy, is a nonmalignant adenomatous overgrowth of the periurethral prostate gland commonly seen in aging men

[1]. Benign prostatic hyperplasia (BPH) is a histologic diagnosis that refers to the proliferation of smooth muscle and epithelial cells within the prostatic transition zone [2]. The enlarged prostate has been thought to contribute to the impairment of the bladder's ability to completely empty, which in turn contributes to the overall lower urinary tract symptoms (LUTS) [1]. According to the American Urological Association's (AUA) Guidelines for the Management of BPH, this is thought to occur as a result of direct bladder outlet obstruction (BOO) and increased smooth muscle tone and resistance from the enlarged prostate[3]. Chronic BOO secondary to BPH may lead to urinary retention, renal insufficiency, recurrent urinary tract infections, hematuria, and bladder calculi. In addition, symptoms attributed to BPH can potentially have a huge impact on quality of life (QOL) and sleep patterns [3]. In the initial evaluation of a man presenting with LUTS, the evaluation of symptom severity and bother is essential [4]. Medical history should include relevant prior and current illnesses, as well as prior surgery and trauma. Current medication, including over-the-counter drugs and phytotherapeutic agents, must be reviewed. A focused physical examination, including a digital rectal exam (DRE), is also mandatory. Urinalysis is required to rule out diagnoses other than BPH that may cause LUTS and may require additional diagnostic tests [5-10]. Indications for operative management of BPH Include: recurrent urinary tract infection (UTI) caused by bladder outlet obstruction, recurrent episodes of urinary retention, bladder calculi, recurrent hematuria caused by bladder outlet obstruction, renal insufficiency caused by BPH [11,12]. For more than nine decades, transurethral resection of the prostate (TURP), generally carried out as monopolar transurethral resection of the prostate (M-TURP), has been the gold standard for the surgical treatment of lower urinary tract symptoms due to benign prostatic obstruction (BPO) and is regarded as both clinically effective and cost-effective [13-17]. The advent of bipolar TURP (B-TURP) offered an attractive alternative to M-TURP with similar efficacy but lower perioperative morbidity using normal saline irrigation [13-15,17]. Complications of transurethral resection of the prostate (TURP) can be intraoperative, early postoperative, and late postoperative [18]. This study aimed to assess the prevalence and types of intraoperative and postoperative complications associated with TURP in two hospitals in Bujumbura.

## Materials and Methods

This was a retrospective descriptive study conducted over a 30-month period, from January 1, 2020, to June 30, 2022. It involved patients who underwent transurethral resection of the prostate (TURP) for benign prostatic hyperplasia (BPH) at two urology departments in Bujumbura: the Kinindo Medical and Surgical Center and Tanganyika Hospital.

## Inclusion Criteria

We included all male patients who underwent TURP for BPH during the study period and whose medical records were complete and available for analysis.

## Exclusion Criteria

We excluded:

- o Patients who underwent other types of prostate surgery (e.g., open prostatectomy or laser enucleation),
- o Patients with incomplete medical records,
- o Patients referred from other healthcare facilities for management of postoperative complications.

## Data Collection

Data were collected using a pre-designed data collection form. The following parameters were retrieved from patient files, surgical reports, and hospital records:

- Sociodemographic characteristics,
- Clinical presentation,
- Diagnostic findings (including Digital Rectal Examination (DRE), PSA level, ultrasound),
- Indications for surgery,
- Intraoperative findings and complications,
- Early and late postoperative complications,
- Duration of catheterization and hospitalization.

## Statistical Analysis

The collected data were entered and analyzed using Epi Info version 7.2.2.6. Descriptive statistics were used to summarize the data, and results were presented in tables and figures where appropriate. Text processing and graphical representation were carried out using Microsoft Word 2016 and Excel 2016.

## Results

During the study period, 143 patients underwent prostate surgery. Transurethral resection of the prostate (TURP) was performed on 118 patients (82.5%). The mean age of the patients was 70.7 years, with extremes ranging from 51 to 90 years. The main reasons for consultation were complete urinary retention (39%), pollakiuria (28.8%), and dysuria (28%). The digital rectal examination revealed benign prostatic hypertrophy in 87.3% of the patients. The PSA (prostatic specific antigen) level was less than 4 ng/ml in 79 patients (66.9%). Renal-bladder-prostate ultrasound revealed post-micturition residual urine in 72 patients, with less than 50 cc in 43 patients (59.7%) and more than 100 cc in 3 patients (4.2%) (Figure 1). Prostate weight between 30 and 60g was found in 60.2% of the cases (Figure 2).

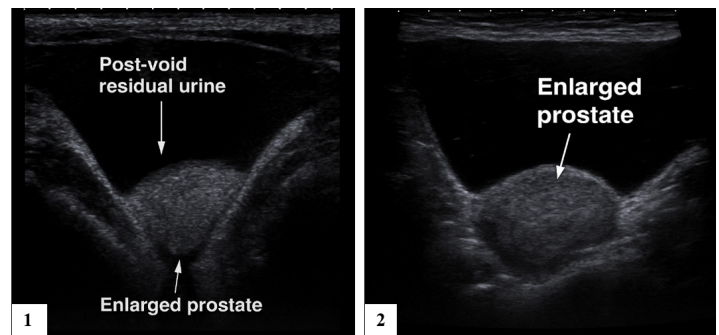


Figure 1 and 2: Enlarged prostate with significant post-void residual urine in a 68-year-old patient.

Only 29.7% of the patients had received prior medication treatment before the surgery. The most common surgical indication was complete urinary retention with failure to remove the catheter, observed in 45 patients (38.1%). There were no intraoperative complications in 97.5% of the cases. The average operative time was 57.97 minutes, with extremes of 45 and 75 minutes. Intraoperative complications included capsular perforation in 2 patients (1.7%) and bulbar urethral injury in 1 patient (0.8%). Early postoperative complications included catheter spasms in 12 patients (10.2%), complete urinary retention after catheter removal in 8 patients (6.8%), urinary tract infections in 4 patients (3.4%), and hematuria due to pressure sores in 2 patients (1.7%). The average time for catheter removal was 2.95 days, with extremes ranging from 2 to 6 days. The average length of hospitalization was 5.08 days, with extremes ranging from 3 to 30 days. Late postoperative complications included retrograde ejaculation in 53.4% of the patients, recurrence of lower urinary tract symptoms in 3.4%, urethral stricture in 1.7%, sclerosis of the prostate bed in 0.8%, bladder neck sclerosis in 0.8%, and urinary incontinence in 0.8%. The characteristics of our patients are summarized in the Table 1.

**Table 1:** Patient Pre-, per- and Post-Operative Characteristics.

Parameter	Workforce (n)	
Total number of patients	143	
Mean age (years)	70.7	
Median PSA (ng/ml)	2.3	
Mean prostate volume (ml)	35.6	
Resected weight (gram)	32.5	
Operation time (min)	57.97	
Hospital stay (days)	5.08	
Intraoperative complications	Capsular perforation	2 (1.7%)
	Bulbar urethral injury	1 (0.8)
Early postoperative complications	Catheter spasms	12 (10.2%)
	Complete urinary retention after catheter removal	8 (6.8%)
	Urinary tract infections	4 (3.4%)
	Hematuria	2 (1.7%)
Late postoperative complications	Retrograde ejaculation	63 (53.4%)
	Recurrence of LUTS	4 (3.4%)
	Urethral stricture	2 (1.7%)
	Sclerosis of the prostate bed	1 (0.8)
	Bladder neck sclerosis	1 (0.8)
	Urinary incontinence	1 (0.8)

## Discussion

Transurethral resection of the prostate (TURP) is a well-established surgical method for treatment of men with lower urinary tract symptoms (LUTS) secondary to benign prostatic obstruction (BPO) [19]. The mean age of the patients was 70.7 years. This is similar to the mean age in related studies which reported mean ages of  $69.26 \pm 10.46$ , 66.1, 67.2,  $66.1 \pm 8.6$ , and  $67.07 \pm 9.38$  among patients with benign prostate hyperplasia [20-23]. It is also similar to the mean ages of similar studies done in the United Kingdom (UK) (70 years), Greece (68.4 years), India (66.94 years), and Italy (70.1 years) [24-26]. In this study, only 29.7% of the patients

had received prior medication treatment before the surgery. The surgical complication of TURP can be intraoperative or postoperative. The common remote complications following BPO surgery are erectile dysfunction(ED), urethral stricture, refractory incontinence and bladder neck contracture [27]. There were no intraoperative complications in 97.5% of the cases. Though rare, bladder perforation can occur during endoscopic management of BPH. Intraoperatively, one may suspect bladder injury with difficulty maintaining bladder distention, increasing abdominal distention during surgery or changes in airway pressures [28]. The complications that can arise from TURP have been extensively documented in a number of studies [29-31].

In our study, early complications were observed in 33 patients, or 28.8% of cases. Irritative symptoms such as “probe thrusting” were the most common early complication, followed by complete urinary retention after probe removal in 10.2% and 6.8% of cases, respectively.

Jens, et al. noted also in their study that the major intraoperative complication remains hemorrhaging that requires blood transfusions [18]. Sascha A, et al. found in their meta-analysis that intraoperative complications are highest for TURP (3.2%) and Holmium Laser Enucleation of the Prostate (HoLEP) (3.5%). However, TURP dominates the variance of intraoperative complications, including bleeding, capsular perforation, the need for blood transfusion, and TURP syndrome [32]. In the same meta-analysis, perioperative complications are acute urinary retention (AUR), clot retention, recurrent haematuria, and urinary tract infections (UTI) or fever are the most frequently reported adverse events after TURP and late complications were bladder neck strictures (BNS; 2%), urethral strictures (4.1%), and persistent urgency [32].

In our study, the average operative time was 57.97 minutes. Some complications are related to prolonged operating times. Despite all technical improvements, overall data reveal no decrease in resection speed of 0.5–0.9 g/min. The average speed of all series is about 0.6 g/min, far from the frequently cited 1 g/min [18]. This reflects the status of TURP as the gold standard during the last few decades. The average length of hospitalization was 5.08 days, with extremes ranging from 3 to 30 days. Haseeb et al. found in their study a short hospital stay <3 days [33]. There is no TURP syndrome noted in our study. TURP syndrome is a potentially life-threatening complication associated with TURP, with the reported incidence of around 0.78–1.4% [34]. TURP syndrome is largely associated with use of hypotonic irrigation during monopolar-TURP (M-TURP), such as sterile water, glycine, and sorbitol [28]. The treatment of severe TURP syndrome is based on correcting electrolytes and making patient hemodynamically stable [34].

Late postoperative complications included retrograde ejaculation in 53.4% of the patients, recurrence of lower urinary tract symptoms in 3.4%, urethral stricture in 1.7%, sclerosis of the prostate bed in 0.8%, bladder neck sclerosis in 0.8%, and urinary incontinence in 0.8%. Jens, et al. noted also in their study that the major two

late complications are urethral strictures (2.2–9.8%) and bladder neck contractures (0.3–9.2%). Despite improvements in surgical techniques, lubricants, instruments, and electrical technology, the incidence of urethral strictures did not change significantly [18]. A multitude of factors can contribute to the formation of anterior urethra strictures and posterior urethral membranous stenosis. Post-TURP urethral strictures may be a result of iatrogenic urethral trauma during TURP, current leak from the resectoscope, and urethral ischemia from compression from large size resectoscope, particularly with prolonged procedures [28]. It is common for large adenomas to bulge under the bladder neck leading to encroachment of the trigone, which requires the surgeon to be cognizant and carry out a meticulous resection to avoid undermining the bladder neck.

While current literature is sparse, the majority of undermining injuries seem to be in part due to frequent passes of the resectoscope across the junction of the prostate and the bladder, which can also result in extraperitoneal bladder injury. Resecting the posterior portion of the prostate at the end of the procedure is a technique employed by some surgeons to prevent this complication [28]. Rectal injury during surgical management of BPH, though incredibly rare, is a feared complication [28]. The practicing urologist has multiple surgical options to choose from in treating patients with symptomatic BPH. The surgical management of BPH is generally well tolerated with high objective success rates that allow for significant improvement in urinary quality of life. It is critical to understand the potential complications associated with these various treatment options, which will enable trainees and practicing urologists to better counsel patients and manage these potential complications.

### Conclusion

Transurethral resection of the prostate (TURP) is a standard technique for treating prostate enlargement. It is a safe and less invasive technique, but it can be associated with a number of complications. Complications can occur during and after surgery. It remains a safe and effective surgical intervention for managing benign prostatic hyperplasia (BPH), particularly in resource-limited settings. In our study, the overall complication rate was low, with most adverse events being minor and manageable. Retrograde ejaculation was the most common late complication, while intraoperative and early postoperative complications were infrequent. These findings support the continued use of TURP as the gold standard for surgical treatment of BPH in our context. However, the presence of complications—though rare—highlights the importance of meticulous surgical technique, adequate training of urologists, and careful perioperative and postoperative monitoring. Future prospective studies with longer follow-up periods are recommended to better evaluate long-term outcomes and functional results.

### Conflicts of Interest

We declare that we have no conflicts of interest.

### Ethical Considerations

This work does not pose any ethical problems.

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No funding was provided.

### Author Contribution

RN contributed to study concept and design, ONN data collection and analysis. SN drafted the manuscript. APN, JLB, DM, MAK, AM, SK, JCM & PB contributed to reviewing and finalizing the manuscript. All authors reviewed the manuscript for intellectual content and approved the submission.

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