



ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCE
SCHOOL OF MEDICINE

*Comparative study on perioperative outcome of patients undergoing
Transvesical prostatectomy and Retropubic prostatectomy for
Bladder Outlet Obstruction Secondary to Benign Prostatic
Enlargement, at Menelik II Comprehensive Specialized Hospital from
Oct 2024 to Oct 2025.(Prospective cohort study)*

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LIST OF ACRONYMS AND ABBREVIATIONS

BPH-Benign prostatic hyperplasia

BOO-bladder outlet obstruction

BPE-benign prostate enlargement

TVP-transvesical prostatectomy

RPP- retro pubic prostatectomy

IPSS- international prostate symptoms score

LUTS-Lower Urinary Tract Symptoms

SPSS : Statistical Package for the Social Sciences

ECOG- Eastern Cooperative Oncology Group

CD –clavin Dindo classification

OSP- open simple prostatectomy

RASP-robot assisted simple prostatectomy

Abstract

Background: Benign prostatic hyperplasia(BPH) has a wide range of management options, from watchful waiting to minimally invasive and open surgical procedures. Although open prostatectomy accounts for less than 5% of BPH surgeries globally, it remains a commonly practiced approach in developing countries such as Ethiopia due to limited resources and a shortage of trained personnel. Among open techniques, the transvesical approach is predominantly performed in our setting, despite better perioperative outcome of the retropubic approach.

Objective: To compare the perioperative outcomes of open simple prostatectomy performed via the transvesical (suprapubic) approach and the retropubic approach for bladder outlet obstruction secondary(BOO) to BPH among patients undergoing surgery at Menelik II Hospital.

Methods: This was an institution-based, multi-operator, prospective comparative cohort study employing a quasi-randomized allocation method. The study included patients with BOO due to BPH presenting to Menelik II Hospital beginning in October 2024 to October 2025. Data were collected using a structured questionnaire covering preoperative, intraoperative, postoperative (ward), and follow-up assessments, completed by resident and intern physicians. Statistical analysis was performed using SPSS. Perioperative outcomes and complications were compared.

Results: A total of 35 patients were included in the final analysis. Baseline demographics and preoperative clinical characteristics were comparable between two groups.

The RPP group showed significantly lower overall complication rates (11.2% vs 55.5%, $p = 0.005$) and reduced blood transfusion requirements (5.8% vs 11.1%, $p = 0.016$). Multivariate analysis adjusted for age and baseline hemoglobin (Hgb) showed that RPP was independently associated with a significantly lower postoperative Hgb drop (adjusted mean difference: 1.48 g/dL less; $p = 0.006$).

Postoperative hospital stay was significantly shorter in the RPP group (adjusted mean difference: 1.62 days shorter; $p = 0.016$), and surgical drains were removed earlier (adjusted mean difference: 1.60 days earlier; $p = 0.001$). There was no significant difference in operative time ($p = 0.449$).

Short-term patient-reported outcomes at 4–6 weeks, including patient satisfaction and LUTS improvement, were similar in both groups ($p > 0.1$).

Conclusion:

Retropubic prostatectomy appeared to be associated with more favorable perioperative outcomes. These findings support adopting RPP as the preferred open surgical technique for BPH in settings where open prostatectomy remains the primary option.

Keywords: Benign prostatic hyperplasia, transvesical prostatectomy, retropubic prostatectomy, lower urinary tract symptoms, Ethiopia.

1. Introduction

1.1 Background

Benign prostatic hyperplasia (BPH) is defined as an increase in the total number of prostatic stromal cells and prostatic glandular epithelial cells within the transition zone of the prostate.(1)

Enlargement prostate is predominant etiology of Lower urinary tract symptoms (LUTS) in elderly men.

Larger prostate volumes, particularly those above 40ml, are associated with an high risk of having LUTS. However, the relationship is not always straightforward. There was a positive significant correlation between prostate volume and IPSS and a negative significant correlation between prostate volume and Qmax.(2)

Its prevalence increases with age, histologically diagnosed BPH increases from 8 percent in men aged 31 to 40, to 40 to 50 percent in men aged 51 to 60, to over 80 percent in men older than age 80.(3)

The global incidence of BPH has risen dramatically from ~6.5 million to 13.5 million new cases annually, underscoring the urgent need for effective treatment options.

BPH has been, and continues to be, a major factor in health care expenditures in the United States, costing up to 4 billion dollars each year.(4)

When symptomatic, BPH presents with lower urinary tract symptoms (LUTS). Typical manifestations are Storage (irritative) symptoms – Urinary frequency, urgency, nocturia and incontinence, Voiding symptoms – Slow urinary stream, straining to void, urinary intermittency (stream starting and stopping during micturition) or hesitancy, splitting of the voiding stream and terminal dribbling: Storage symptoms are often more bothersome than voiding symptoms.

The evaluation of LUTS /BPH should include a detailed medical history and focused physical examination, which should include a brief neurologic screen, abdominal examination, and genitourinary examination including digital rectal examination (DRE). A small number of laboratory tests are needed to exclude other etiologies. Prostate imaging with Trans rectal ultrasound, cystoscopy, and dynamic studies selected patients to choose treatment options, rule out other cause of LUTS and follow up patients on management.

The diagnosis is established by the presence of storage, voiding, and/or irritative urinary symptoms in the absence of history, examination or laboratory findings suggesting of non-BPH causes of LUTS.

Management of BPH depends on symptom severity and impact on quality of life, patient preference, and available treatment options. Prostate size, secondary complications like diverticula stone formation, patient comorbidities and fitness to anaesthesia, post-surgery effects on sexual function and fertility should also be considered.

Several tools have been developed to assess symptom severity in patients with BPH, the International Prostate Symptom Score (IPSS), is most famous and widely used tool.(4 original 5) Based on IPSS score symptoms can be classified as mild, moderate or severe.

Management options could be ranging from watchful and waiting, medical management to surgeries which include minimally invasive transurethral procedures to laparoscopic or robotic or open prostatectomies.

Over past 50 years management of patients with BPH has evolved dramatically towards medical and minimally invasive surgeries.

Here in Ethiopia, BPH managed with watchful waiting medical and surgical management. Most of surgical procedures are open prostate surgeries especially in public hospitals due to lack of materials for minimally invasive techniques and lack of skilled man power. Among open surgeries the popular one is transvesical prostatectomy likely due to most surgeons are trained on this particular technique.

1.2 Statement of the problem

BPH is the most common cause of BOO in aging men, with surgical intervention often required when medical therapy fails,

Minimally invasive surgical techniques become nowadays popular management of BPH. However, Open prostatectomy is mainstay of management and still commonly done surgical approach in resource limited setups like ours despite prostate surgical size.

Endoscopic prostate surgeries have significantly improved peri operative complications compared to traditional ways of BPH management which is open prostate surgeries.

Most of public hospitals including Menelik II comprehensive specialized hospital has no endoscopic management setups. So open prostate surgery is practiced for BPH patients with surgical indication despite size of prostate.

Among open prostate surgery for BPH, TVP is commonly done procedures due to most surgeons are trained on TVP during their residency years.

RPP is said to have slightly lower perioperative outcome rate such as duration of surgery ,shorter hospital stay ,while TVP has some advantages when prostate size larger than 100grams and concomitant bladder pathology otherwise both techniques has almost comparable long term outcome.

Prostate size larger than 75 gram is indication for open simple prostatectomy but here in Menelik hospital and most other public hospitals in Ethiopia open surgery is being done despite prostate size.

Surgical technique of both procedures:

Terece Millin,an Irish urologist who first did retropubic simple prostatectomy in 1945. Before Millin opularized this technique transvesical prostatectomy was standard approach. There was also third approach which is perineal prostatectomy barely practised these days due its high risk of rectal injuries, fistulas and almost certain erectile dysfunction.

In retropubic simple prostatectomy, enucleation involves a direct incision of the anterior prostatic pseudocapsule. There are two techniques based on approach of adenoma enucleation

Millin Technique or Transverse Capsular and Vesicocapsular Technique, of these Millin (Transverse Capsular) is popular one as later technique carries risk of urine leak, and it carries the risk of incision extending in to urinary sphincter.

Modified retro pubic simple prostatectomy (MRP) includes applying several homeostasis stiches on prostate capsule and dorsal vein complex to reduce bleeding risk.

In contrast, open suprapubic (transvesical) prostatectomy in volves an extraperitoneal approach, with anterior vesicotomy allow ing for access to the prostatic adenoma via bladder neck mucosal incision.

Table 1: Summary of technical comparison between TVP and RPP

Feature	Retropubic Prostatectomy (RPP)	Suprapubic Transvesical Prostatectomy (STVP)
Surgical Approach	Direct incision of the anterior prostatic pseudocapsule.	Extraperitoneal approach with anterior vesicotomy, accessing the adenoma via bladder neck mucosal incision.
Anatomic Exposure	Excellent anatomic exposure of the prostate.	Less direct access to the prostate itself.
Adenoma Visualization	More direct and complete visualization of the prostatic adenoma during enucleation, ensuring total removal.	Less direct visualization of the prostatic adenoma.
Urethral Transection	Precise transection of the urethra distally to avoid sphincteric injury.	Less direct control of distal urethral transection.
Hemostasis	Superior visualization of the prostatic fossa after enucleation for hemostasis.	Potentially less direct visualization for hemostasis in the prostatic fossa.
Bladder Access	Lack of bladder access; surgical trauma to the urinary bladder is avoided.	Inherent entry into the bladder, allowing simultaneous access to address: 1. A large intravesical median lobe 2. Clinically significant bladder diverticula 3. Large bladder calculi
Disadvantages	1. Venous bleeding associated with disturbance of the dorsal venous complex. 2. Lack of bladder access to address concomitant bladder diverticula and/or bladder calculi. 3. Less direct access and visualization for excision of a large intravesical median lobe, for which the suprapubic transvesical approach may be superior.	-
Advantages	1. Excellent anatomic exposure of the prostate 2. More direct and complete visualization of the prostatic adenoma during enucleation to ensure total removal 3. Precise transection of the urethra distally to avoid sphincteric injury 4. Superior visualization of the prostatic fossa after enucle ation for hemostasis 5. Avoidance of surgical trauma to the urinary bladder	1.Ability to simultaneous address large intravesical median lobe, clinically significant bladder diverticula, and or large bladder calculi.

This research will fill the study gaps in direct comparing between TVP and RPP techniques in perioperative outcomes like intraoperative transfusion rate, operative time, hospital stay and short term urinary symptom improvement.

The result of the research will give insight in to two techniques hint better techniques which may in turn affect procedure choice and resident training

1.3 Significance of study

This comparative prospective cohort study will assess

- What open surgical technique (TVP /RPP) has good intraoperative and postoperative outcomes in management candidates for surgery in patients with BPH ?
- Intraoperative blood loss, transfusion rate, operative time, hospital stay, post-operative complications and subjective urinary function are compared between two surgical modalities.

By investigating these questions, this research seeks to:

- Understand the perioperative outcomes of both techniques.
- Analyse the complication rate between two techniques.
- Improve potential management options for BPH patients with surgery indications.

Findings will inform local surgical guidelines, optimize resource allocation, and improve patient outcomes by identifying the most effective open simple prostatectomy technique for BPH in Ethiopia and beyond with resource limited setups.

2. Literature review

The prevalence of BPH rises markedly with increased age. Autopsy studies have observed a histological prevalence of 8%, 50%, and 80% in the 4th, 6th, and 9th decades of life, respectively.(5)

The relation between clinical BPH and LUTS is complex, because not all men with clinical BPH develop LUTS and not all men with LUTS have clinical BPH.

Studies doesn't showed distinct pattern of association of to BPH risk and race. Observational studies comparing black, Asian and white men have produced variable results. Studies of black men in the US have showed an increased prostate transition zone and total prostate volume compared with white men.(6)

Evidence suggests a strong genetic component to BPH. A case control analysis, in men less than 64 years of age who undergo surgery for BPH, showed that male relatives and brothers had a 4-fold and 6-fold increase, respectively of age-specific risks for having BPH related surgery .(7)

Though observational study, lifestyle like diet rich in vegetables, physical activity and alcohol ingestion are said to have protective effect BPH development.

Metabolic syndrome obesity diabetes dyslipidemia and inflammation are reportedly associated with increases the risks of BPH surgery, urinary symptom progression and initiation of BPH medical therapy.

In United States; estimated annual costs of caring for these men exceed \$4 billion. BPH is rarely life threatening, but often affects quality of life in different magnitude. Men aged 65–74 years bear the greatest absolute burden of BPH globally, accounting for 42% of cases among men aged 40 and older. The highest age-specific prevalence is in men aged 75–79 years at 24,300 per 100,000, followed by those aged 80–84 years at 23,500 per 100,000 and those aged 70–74 years at 22,200 per 100,000.(11)

Globally, 2019, there were 11.26 million new cases of BPH and 1.86 million years lived with disability. While the age-standardized rates of incidence and years lived with disability subtle decrement from 1990 to 2019, the absolute numbers increased significantly due to population growth and aging. BPH burden differs widely by region, socioeconomic status, and country. (12)

BPH prevalence in low- and middle-income countries varies widely, affecting between 10% and 69% of men aged 50 and older. At the facility level, the direct annual cost of managing BPH is approximately USD 12,810.(12)

The management of BPH has undergone temporal changes throughout the study period. The treatment modalities for BPH vary by region and race in a real-world context.patient factor,socioeconomic status and available options greatly influence management of BPH.

BPH is treated primarily with watchful waiting, phytotherapy (herbs), and medical or surgical options.

In the face of newer technologies, TURP remains the most common surgery for BPH in the United States. PUL has been rapidly adopted while HoLEP comprises a consistent minority of cases. Surgeon age, patient age, and urologist subspecialization were associated with use of certain BPH surgical approaches.(13)

Utilization of minimally invasive surgical techniques such as water vapor therapy, UroLift, prostate artery embolization (PAE) is raising while prostatectomies either through laparoscopic/robotic or open approach has significantly of decreasing for BPH management.

Guidelines recommendation for management of BPH surgery is indicated: for patients who have uppertract damage, urinary retention, recurrent urinary tract infections (UTIs), recurrent bladder stones or gross hematuria, and/or patients who opted surgery.

Open, laparoscopic, or robotic assisted prostatectomy should be considered as treatment options by clinicians, depending on their expertise with these techniques, only in patients with large to very large prostates. A recent systematic review and meta-analysis comparing minimally invasive and OSP indicates that RASP offers comparable efficacy in improving symptoms and flow rates. However, RASP demonstrated has some clinical advantages, including reduced catheterization times, shorter hospital stays, and lower rates of both blood transfusions and overall complication.(AUA,2023)

A review of seven randomized controlled trials involving 735 patients indicates that endoscopic procedures(EP) and open procedures yield comparable long-term functional results. At 3-, 6-, and 12-month follow-up intervals, no significant differences were observed regarding the IPSS, Qmax, quality of life scores, or post-void residual urine volume. However, endoscopic methods demonstrated clear clinical advantages in several perioperative and recovery metrics. Specifically, patients in the EP group experienced significantly shorter catheterization times and hospital stays, alongside higher scores on the International Index of Erectile Function (IIEF-5).Endoscopic procedures was associated with a smaller decrease in hemoglobin levels and lower risk of blood transfusions.While both methods are effectively equivalent in symptom relief, endoscopic procedures offer a more efficient recovery profile and a superior safety margin regarding blood loss.(11)

In Sub-Saharan Africa still open prostate surgeries are popular despite comorbidities associated with it. The main challenges encountered relate to the lack of competent personnel, the unavailability of equipment and materials, and the high cost to patients.

Open simple prostatectomy is being practiced in most of sub-Saharan Africa especially in public hospitals. In one the study done at tertiary public hospitals in Ethiopia TURP was mostly practiced approach(62.5%) for BPH.(12)

There are two open surgical techniques such as transvesical and retropubic approaches of enucleating prostate for BPH.

Here in Ethiopia almost most of surgical training centres train their residents on transvesical suprapubic prostectomies.

When two techniques compared;

The SP technique was related to a higher incidence of minor complications in the late postoperative period. High volume prostates were associated with increased bleeding when

the RP technique was utilized. The RP prostatectomy was associated with higher peak urinary flow and a trend of a lower IPSS Score.(12)

A prospective study conducted at Conakry University Hospital compared the retropubic and transvesical surgical techniques in 70 patients with benign prostatic hyperplasia. The results consistently favored the retropubic approach across all primary perioperative and postoperative parameters. Patients who undergone the retropubic procedure experienced lower average blood loss and significantly shorter duration of surgery compared to the transvesical group. The retropubic group had a more smooth post-operative course, given they had reduced catheterization durations and shorter hospital stays.(14)

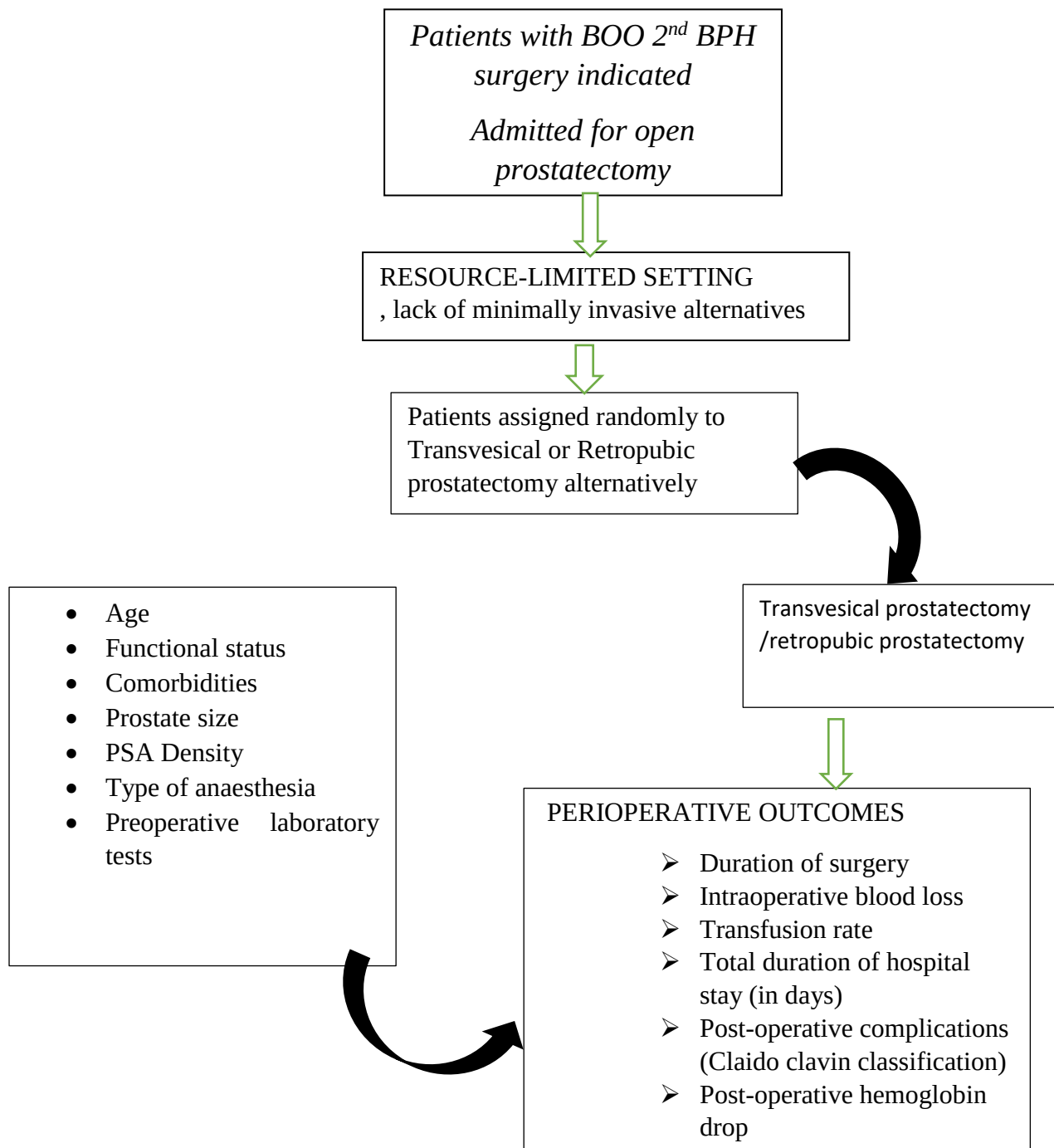
A prospective cohort study in Kyrgyzstan compared the outcomes of retropubic (RPP) and transvesical (TVP) open prostatectomy in patients with BPH. While the retropubic approach required longer operative times and resulted in higher initial blood loss, it proved superior in several key recovery metrics. Patients in the RPP group had higher hemoglobin and red blood cell counts 6th day after surgery when compared with TVP group. Furthermore, the retropubic technique led to significantly shorter hospital stays and reduced durations for both catheterization and bladder irrigation. Retropubic procedure group patients had better urinary symptom relief, as observed in their superior postoperative symptom scores change. Although low-grade complication rates were similar between the two methods, the conclusion was the modified retropubic approach is the more favorable surgical option due to its clinical and symptomatic advantages.(15)

A prospective randomized trial in Brazil evaluated the learning curve of residents performing open TVP versus RPP in 65 consecutive patients with lower urinary tract symptoms (LUTS) and prostate volumes exceeding 75g. The study compared 33 TVP procedures against 32 RPP procedures, identifying 49 total complications: 4 intraoperative, 12 immediate, 11 early, and 22 late. Of these, 17 were classified as severe (Clavien 3 or 4), while 32 were minor (Clavien 1 or 2).

Complications were more seen in the TVP group, particularly late-stage complications (17 vs. 5). Within the late complication category, the TVP group reported seven severe cases (Clavien 3) compared to only one in the RP group. While blood transfusion was required for three TVP patients and one RPP patient, estimated blood loss was similar across both cohorts, averaging 1,044 cc. No statistically significant difference was found in mean operating time, which averaged 126.5 minutes (125.65 for TVP vs. 127.41 for RPP).

The retropubic approach demonstrated superior functional outcomes, with a significantly higher peak urinary flow rate (23.03 mL/s vs 16.77 mL/s; $P = .008$) compared to the suprapubic technique.¹ However, the suprapubic technique was associated with lower blood loss in prostates larger than 100g ($P = .003$). (16)

Figure 1 Conceptual frame work



3. Objectives of study

3.1 Core objective of study

- To compare perioperative outcome of open simple prostate surgeries for BOO secondary to BPH, who are candidates for surgeries.

3.2 Specific objective study

- To compare the operative time (in minutes) between TVP and RPP.
- To compare the incidence of intraoperative complications
- To compare the length of hospital stay (in days) following TVP and RPP..
- To compare the incidence of postoperative complications requiring intervention during the hospital stay.

4. Methods and materials

4.1 Study area and period

Comparative study on perioperative outcome of patients undergoing transvesical prostatectomy and retropubic prostatectomy for BOO secondary to BPH at Menilik II comprehensive specialized hospital from October 2024 to October 2025.

This study was conducted at Menelik II Referral Hospital, a public tertiary facility established in 1909 and one of Ethiopia's pioneer hospitals. It is located on Russia Street near Jan Meda. The hospital is an affiliate of Addis Ababa University's Tikur Anbassa Hospital. It provides a wide range of clinical services, including urological care.

4.2 Study design

Hospital based prospective quasi-randomized (systematic alternation) cohort study.

4.3 Source and study population

- **Target population**-BPH patients who are candidates for open prostatectomy.
- **Source of study** are all BPH patients seen at Urology outpatient department.
- **Study populations** are all BPH patients who underwent open prostate surgery at Menilik II comprehensive specialized hospital during study period.
- **Study subjects**-actual participants

4.4 Inclusion and exclusion criteria

Inclusion criteria

- All patients admitted to wards and undergoing open simple prostate surgery for BPH

Exclusion criteria

- Previous bladder/prostate surgery
- BPH with additional other surgeries like hernia strictures
- Patients on anticoagulant/known bleeding diathesis
- Suspected prostate malignancies; both clinically and pathologically

4.5 Sample size determination

Sample size was calculated using formula for comparing two proportions in cohort study:

$$n = \frac{2(Z_{\alpha} + Z_{1-\beta})^2 \times P \times (1-P)}{d^2}$$

Where:

- P_1 and P_2 : expected event rates in each group (e.g., proportion of complications)
- $P = (P_1 + P_2) / 2$
- $d = |P_1 - P_2|$
- Z_{α} (for 0.05 significance, two-sided): 1.96
- $Z_{1-\beta}$ (for 80% power): 0.84

P values obtained from prospective cohort study comparing TVP to RPP done in Guinea.(14)

- Expected event rate for suprapubic group (P1P1): 30% (0.30)
- Expected event rate for retropubic group (P2P2): 10% (0.10)
- $P = (0.30 + 0.10) / 2 = 0.20$ $P = (0.30 + 0.10) / 2 = 0.20$
- $d = 0.30 - 0.10 = 0.20$ $d = 0.30 - 0.10 = 0.20$

Put in the values:

$n = 2 \times (1.96 + 0.84)^2 \times 0.20 \times (1 - 0.20) / (0.20)^2 \approx 63$ per group $n = (0.20)^2 \times (1.96 + 0.84)^2 \times 0.20 \times (1 - 0.20) \approx 63$ per group = 63 participants per group.

Assuming 10 % dropout rate final sample size will be 70 in each group.

4.7 Sampling technique

Surgeries were done alternately. Because the hospital was undergoing renovation, there was one operation table available per week.

Patients were seen at the Urology referral clinic, which was active two days per week. Those who were candidates and opted for open prostate surgery were sent to Liaison, where they were booked. Liaison staff admitted patients to be operated on based on their booking list order. Staff working there were blinded to the study. Admitted patients were scheduled for TVP or RPP every other OR day. Then, patients were operated on by two experienced urologists assisted by residents.

4.8 Study variables

Dependant variables

- Transfusion rate
- Number of fluid required for irrigation
- Post operation Hospital stay
- Post-operative complications
- Total duration of surgery
- Intraoperative blood loss in ml
- Total number fluid required for irrigation of bladder
- Total amount of drain out put
- Days of drain removal
- Post-operative drop in hemoglobin level
- Complications related to surgery during intra operative, ward stay or follow up at clinic
- Patient satisfaction
- LUTS improvement

Independent variable

- Age
- Comorbidities(DM,HTN--)

- Prostate size
- Type of anaesthesia
- Preoperative laboratory tests(Hgb level,PSA level)

4.9 Operational definition

- **Bladder Outlet Obstruction (BOO)**-urodynamic study finding defined by high detrusor pressure and low urine flow rate during the voiding phase. (International Continence Society)
- **BPH**-clinically enlarged prostate more than >30cc.
- **Benign prostatic obstruction(BPO)**-enlarged prostate resulting in BOO
- **Transvesical Prostatectomy**-open prostatectomy technique in which prostate adenoma enucleated through lower abdominal incision and opening in the bladder.
- **Retropubic prostatectomy**- open prostatectomy technique in which prostate adenoma enucleated through lower abdominal incision directly opening prostate capsule without opening bladder.
- **Total duration surgery**- time elapsed between skin incisions to closure.
- **Clot retention**-The inability to adequately void or drain urine due to the accumulation of blood clots within the bladder, causing mechanical obstruction to urinary outflow.
- **Fluid for bladder irrigation**- Intraoperative and postoperative fluid requirements for bladder irrigation: The volume of normal saline required to achieve a clear effluent, as determined by the attending physician.
- **Post operative haemoglobin/haematocrit**- level of haemoglobin/haematocrit determined 8-10hours after surgery.
- **Early Complications related to open simple prostate surgery**- Early complications related to open prostate surgery, including those resulting from both surgical and anesthetic causes, occurring during the intraoperative period and within the first 3 months. post-operatively, were graded using the Clavien-Dindo classification.
- **Clavien Dindo classification**-It is a classification used to grade severity of postoperative complications.
 - Class 1,2 and 3a -Minor complications.
 - Class 3b or 4 -Major complications.
- **Perioperative period**-is a continuous process that encompasses the preoperative, intraoperative, and postoperative phases, from the initial decision for surgery through patient discharge and a follow-up period extending 30 to 90 days post-surgery.(AUA definition)

4.10 Data source and collection tools

The source of data was mainly patient interviews in person or by phone call, medical records, and physician observation.

Data was collected using a non-validated questionnaire (see collection sheet in Appendix 1), which is filled by urology residents, interns and ward nurses. The questionnaire was categorized into four main parts.

1-Pre-operative data:

These included interview data (socio-demographic data, comorbidities, history and physical examination, laboratory tests and imaging results).

2-Intraoperative data:

These were intraoperative data collected by observation in the operating room.

- Surgical technique (transvesical or retropubic),
- Type of anesthesia (Spinal, epidural, general),
- Duration of operation (minutes),
- Operative incidents (rupture of prostatic capsule, volume of blood lost in ml) and their management (repair, blood transfusion),
- Irrigation fluid for bladder used on table and post anaesthesia care unit.

3-Post-operative data:

It was entire period of the patient's hospitalization after the operating room) up to the first follow-up appointment, i.e. a minimum of two weeks. It included:

- Irrigation duration (days), amount of irrigation fluid required, drain removal duration (days),
- Post-operative haemoglobin level
- Early complications (hemorrhage, surgical site infection, clot retention, medical complication)
- Day of removal of Transurethral catheter

4-Followup data

It was period after first clinic visit to 3 months of period.

- Any complication like incontinence
- Patient satisfaction
- Subjective symptom assessment of LUTS

4.11 Data quality

To ensure data accuracy and completeness, double data entry and cross-checking of records were implemented.

4.12 Data analysis

Data analysis was conducted using **IBM SPSS Statistics version 27.0.1** with significance defined by p value of <0.05 .

Descriptive statistics including frequency tables, measures of central tendency were used to summarize patient demographics, clinical characteristics, treatment patterns, and outcome data.

Baseline patient characteristics and the primary and secondary outcomes (e.g., complication rates, operative time, and length of stay) were compared between the two surgical groups (TVP vs. RPP).

For binary primary outcomes (e.g., major complication rate), multivariable logistic regression were used to calculate adjusted odds ratios (aOR) with 95% confidence intervals (CI).

For continuous primary outcomes (e.g., change in hemoglobin level), multivariable linear regression were used to calculate adjusted mean differences with 95% CI.

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4.13 Ethical Issues

Ethical approval was obtained from Tikur Anbassa Hospital College of Health sciences (TASHCHS) institution review board (IRB) before initiating the study.

4.14 Dissemination plan

The study findings are planned to be disseminated via presentations at scientific or society meeting conferences and publication in journals.

5. Results

5.1 General characteristics

Through randomized sampling 41 patients were initially included in study but six patients were excluded due to need of: additional surgical procedures like inguinal hernia repair and meatal stenosis reconstruction (each one), intra operative severe adhesion likely undiagnosed prostatic cancer (n=1), spinal anaesthesia related complication(n=1) and two patients due to incompletely filled data.

Thirty-five patients were able to meet the eligibility criteria and included in the final analysis. Based on randomized patient distribution for surgery 18 patients underwent simple suprapubic transvesical prostatectomy, while 17 patients underwent modified retro pubic simple prostatectomy.

5.2 Analysis of demographic and baseline clinical findings

Both of the surgical groups were comparable across all relevant demographic parameters: age, comorbidity, occupation, and habits like smoking.

RPP patients were slightly older on average Mean=65.24 than TVP patients Mean=62.78. The median DRE grade was slightly higher for the RPP group {Median}=3) compared to the TVP group Median=2). Both groups had a median performance status of 1, indicating generally good functional status. The majority of patients in both groups presented with Severe IPSS LUTS Symptoms. **TVP vs RPP (n=12 66.7% ,n=12 70.6%** of patients had severe symptoms and moderate Symptoms TVP group(n=5 27.8%) and RPP group (n=5 ,29.4%) ,only one patient in TVP group had mild symptoms.

Table 2 Frequency Distributions for demographic and baseline clinical finding

Variable	Category Value	TVP Count (%)	RPP Count (%)
Occupation	Farmer	3 (16.7%)	4 (23.5%)
	Government or NGO Employee	5 (27.8%)	4 (23.5%)
	Private Work	4 (22.2%)	3 (17.6%)
	Retired	6 (33.3%)	6 (35.3%)
	No Comorbidity	11 (61.2%)	11 (64.7%)
Comorbidity	Hypertension	5 (27.8%)	6 (35.3%)
	Diabetes	1 (5.6%)	0 (0.0%)
	CKD	1 (5.6%)	0 (0.0%)
	No Habit	15 (88.8%)	17 (100.0%)
Habits	Smoker	2 (11.1%)	0 (0.0%)
	Yes	8 (44.4%)	12 (70.6%)
Medical Management	No	10 (55.6%)	5 (29.4%)
	Yes (Single Episode)	6 (33.3%)	4 (23.5%)
Episodes of AUR (Acute Urinary Retention)			

No AUR Episode	12 (66.7%)	11 (64.7%)
Yes (More than once)	0 (0.0%)	2 (11.8%)

TVP-transvesical prostatectomy RPP-Retropubic prostatectomy

5.3 Laboratory and ultrasound imaging parameters

The mean preoperative laboratory and ultrasound parameters were comparable between the TVP and RPP groups. Hemoglobin levels were similar, with TVP averaging 13.7 g/dL and RPP 13.5 g/dL, reflecting well-maintained baseline blood status in both groups. Creatinine showed mild elevation but no significant difference, averaging 1.1 mg/dL in TVP and 1.2 mg/dL in RPP, indicating near-normal renal function. PSA levels were elevated, consistent with benign prostatic hyperplasia, averaging 15.0 ng/mL in TVP and 14.5 ng/mL in RPP with no clinically relevant difference.

Prostate size was moderately large in both cohorts, with an average of 58 mL in TVP and 62 mL in RPP. Imaging findings showed that median lobe presence was noted in about half of patients in each group (55% TVP, 50% RPP). Hydronephrosis and bladder changes were relatively uncommon but slightly more frequent in the RPP group, with hydronephrosis present in 20% of RPP patients versus 15% in TVP, and bladder changes in 12% versus 10%, respectively. Overall, these parameters indicate balanced baseline clinical and anatomical profiles between TVP and RPP groups prior to intervention.

Hemoglobin, creatinine, and PSA values show no significant difference between groups, reflecting balanced baseline clinical status.

- Prostate size and imaging findings show mild variability.
- Percentage values are based on available documented presence or absence of median lobe, hydronephrosis, and bladder changes in the cohorts.

Table 3 Baseline laboratory and image parameters compared

Parameter	TVP (Mean ± SD)	RPP (Mean ± SD)
Hemoglobin (g/dL)	13.7 ± 1.2	13.5 ± 1.3
Creatinine (mg/dL)	1.1 ± 0.3	1.2 ± 0.4
PSA (ng/mL)	15.0 ± 5.5	14.5 ± 6.0
Prostate Size (mL)	58 ± 15	62 ± 18
Median Lobe Presence (%)	55%	50%
Hydronephrosis Presence (%)	15%	20%
Bladder Change Presence (%)	10%	12%

SD- standard deviation PSA-prostate specific antigen

5.4 Intra operative analysis

The most frequent surgical indications differed slightly by procedure: for **RPP**, the leading indication was **Failed medical management** (7 patients, 41.2%), while for **TVP**, it was **Patient preference** (7 patients, 38.9%). Spinal Anesthesia (**SA**) was the dominant choice, used in 100.0% of RPP patients (17 patients) and 88.9 of TVP patients (16 patients), with only 2 TVP patients SA was changed to General Anaesthesia (GA) due to failed SA.

The choice of abdominal incision strongly correlated with the procedure type, confirming the group allocations: **RPP** was done with **Lower midline** approach in 94.1% of cases (16 patients), with 1 crossover to Pfannestiel. while, **TVP** primarily done through the **Pfannestiel** approach in 88.9% of cases (16 patients), 2 case were done with Lower midline.

There were two major intra operative incidents prostate capsule perforation and tissue loss in RPP group and posterior extension of bladder neck incision in TVP group. Twenty two French 3 way Foley catheter used transurethral for all patients in both groups and suprapubic catheter was placed for every patient in TVP group and only one patient in RPP group.

5.4.1 Duration of Surgery (minutes)

- Both Transvesical Prostatectomy (TVP) and Retropubic Prostatectomy (RPP) procedures had the same median operative time of **120 minutes**.
- The RPP group exhibited a slightly narrower spread of procedure times (IQR: 105–130 min) compared to the TVP group (IQR: 120–150 min).

5.4.2 Estimated Blood Loss (mL)

- The estimated intraoperative blood loss was **same** between the two surgical approaches, with both groups reporting a median of **300 mL** and an Interquartile Range (IQR) of 200–400 mL.

5.4.3 Total Irrigant Fluid Bags Used (OR + PACU)

- The **TVP group required significantly more total irrigation fluid** (OR + PACU) than the RPP group.
 - The median usage for TVP was **4 bags** (IQR: 3–4 bags).
 - The median usage for RPP was **2 bags** (IQR: 2–3 bags).

5.4.4 Intraoperative Transfusion Rate

- The Transfusion Rate was low in both groups, confirming that the majority of patients did not require a transfusion .Indication for intraoperative transfusion was significant bleeding with persistent low blood pressure.
 - The **TVP group had a higher Transfusion Rate at 11.1%** (2 out of 18 patients).
 - The **RPP group had a lower Transfusion Rate at 5.9%** (1 out of 17 patients).

Table 4 Intra operative parameters compared

Parameter	TVP (n=18)	RPP (n=17)	Unit
Duration of Surgery(in min)	120.0 \ (120.0 - 150.0)	120.0 \ (105.0 - 130.0)	Median (IQR), min
Estimated Blood Loss(im ml)	300.0 \ (200.0 - 400.0)	300.0 \ (200.0 - 400.0)	Median (IQR), mL
Total bladder Irrigation Bags (OR + PACU)(no.of NS bags)	4.0 \ (3.0 - 4.0)	2.0 (2.0 - 3.0)	Median (IQR), bags
Intraoperative Transfusion Rate	11.1%	5.8%	Percentage

PACU-Post Care Unit OR-operation Room NS- normal Saline IQR-interquartile Range

5.5 Post-operative parameters

In both groups, no patient had fever or medical complication during postoperative ward stay. But both group had minor complications (Calvin Dindo grade I/II).

These parameters (Median and IQR) were compared using the **Mann-Whitney U Test**.

Table 5 Comparing post-operative parameters

Parameter	TVP Median (IQR)	RPP Median (IQR)	p-value	Significance
Ward Irrigation Bags (no.)	21.5 (18.5–23.8)	15.0 (10.0–16.0)	0.000	Significant
Drainage Tube Removal (days)	3.5 (3.0–4.8)	2.0 (2.0–2.0)	0.000	Significant
Total Drainage Output (mL)	400.0 (300.0–650.0)	180.0 (70.0–300.0)	0.002	Significant
Post-op Hospital Stay (days)	4.0 (3.2–5.0)	3.0 (2.0–3.0)	0.003	Significant
Bladder Irrigation Continued (days)	2.0 (1.2–2.8)	1.0 (1.0–1.0)	0.004	Significant
Hemoglobin Drop (mg/dL)	2.36(1.0–3.2)	1.24 (0.5–1.8)	0.033	Significant
Clot Blockage Rate (Yes,yes more than once)	55.5%	11.6%	0.045	Significant
0 (No Complication)	8	16	44.4%	94.1%
1 (Grade 1)	7	1	38.9%	5.8%
2 (Grade 2)	3	1	16.7%	5.8%
Total (minor complication)	10	2	55.5%	11.6%

IQR- interquartile range Complication was graded with Clavin-Dindo classification

5.6 Comparison of Follow-Up Outcomes

The average days for the first and second post-operative clinic visits were comparable between TVP (11.8 days, 35.9 days) and RPP (10.5 days, 35.4 days) groups. The median day of transurethral catheter removal 7 days for both groups.

These variables were compared using the median and interquartile range (IQR) via the Mann-Whitney U Test for time variables and ordinal scales, and Fisher's Exact Test for the binary postoperative incontinence complication rate.

During 2nd clinic visit two patients from TVP group had significant complication one meatal stenosis and the other had mixed incontinence (urge with stress incontinence).

Table 6 Comparison of Follow-Up Outcomes

Parameter	TVP Median (IQR)	RPP Median (IQR)	p-value	Significance
Patient Satisfaction	2.0 (1.0–2.0)	1.0 (1.0–1.2)	0.035	Significant
TU Catheter Removal (POD)	8.0 (7.2–9.8)	8.0 (7.0–10.0)	1.000	Not Significant
Second Clinic Visit (POD)	37.0 (30.0–40.0)	38.0 (31.0–40.0)	0.947	Not Significant
Symptom Improvement Score	1.0 (1.0–2.0)	1.0 (1.0–2.0)	0.343	Not Significant
First Clinic Visit (POD)	11.0 (8.2–14.0)	10.0 (9.0–12.0)	0.342	Not Significant
Incontinence Rate (Yes)	5.6%	0.0%	1.000	Not Significant

IQR- interquartile range

5.7 Association and correlation between independent and dependent variables,

5.7.1 Logistic Regression Analysis for binary outcomes

Table 7 Odds Ratios (OR) and Adjusted Odds Ratios (aOR) for Post-Operative Outcomes, Comparing RPP to TVP (Reference).

Endpoint	Adjustment Type	N (Total)	Events (Total)	OR (RPP)	95% CI	P-Value	Interpretation
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				vs TVP)			
Clot Retention Episode	Crude OR (Univariable)	35	11	0.15	[0.03, 0.76]	0.022	Significant RPP benefit (Unadjusted OR.)
Clot Retention Episode	Adjusted OR (Prostate Size)	35	11	0.17	[0.03, 0.98]	0.048	Significant RPP benefit (Adjusted for Prostate Size.)
Minor Complication (CD-grade I/II)	Crude OR (Univariable)	35	11	0.15	[0.03, 0.76]	0.022	Significant RPP benefit (Unadjusted OR.)
Transfusion Rate	Crude OR (Univariable)	35	3	0.50	[0.04, 5.56]	0.575	Non-significant RPP benefit (Unadjusted OR.)

OR- odds ratio

5.7.2 Multivariate Regression Analysis

The effect of the Surgical Group (TVP and RPP) was tested while statistically adjusting for key pre-operative variables (age, Hgb, PSA, and DRE) to see if the difference was independent of baseline patient characteristics. The analysis used ordinary least squares (OLS) models. The RPP procedure shows a highly significant, protective effect ($p < 0.016$) for all post-operative efficiency, bleeding, and drainage outcomes, independent of patient age, pre-operative Hgb, or DRE. After adjustment, RPP patients had, on average, a 1.6-day shorter hospital stay and 1.5 g/dL lower Hgb drop compared to TVP patients. The difference in Duration of Surgery is not statistically significant ($p = 0.449$). Short –Term (4-6weeks) Outcomes: Differences in Patient Satisfaction and LUTS Improvement are not significant in multivariate models, suggesting these outcomes are driven primarily by pre-operative patient factors like Comorbidity.

Table 8 Multivariate Association Analysis (Adjusted Group Effect)

Endpoint	Model (Adjusted For)	(RPP) Coef (vs TVP)	p-value	RPP Effect (Adjusted)
Post-op Hospital Stay	OLS (Group + Age)	-1.623 days	0.016	Significantly Shorter Stay
Irrigation in OR	OLS (Group + DRE)	-1.482 units	0.009	Significantly Less Fluid Used

Hgb Drop	OLS (Group + Hgb)	-1.482 g/dL	0.006	Significantly Lower Hgb Drop
Total Drain Output	OLS (Group + Age)	-379.289 mL	0.008	Significantly Less Drainage
Days of Drain Removal	OLS (Group + Age)	-1.605 days	0.001	Significantly Shorter Duration
Duration of Surgery	OLS (Group + Age)	-7.059 minutes	0.449	Not Significant (RPP took slightly shorter)
Intraoperative Blood Loss	OLS (Group + Hgb)	-227.135 mL	0.190	Not Significant (Trend towards RPP)
Patient Satisfaction	OLS (Group + Age)	-0.137	0.621	Not Significant
LUTS Improvement	OLS (Group + Age)	0.579	0.147	Not Significant

OLS -ordinary least squares

5.7.3 Relationship between Continuous Variables.

Table 9 Spearman's Rank Correlation: Relationship Between Continuous Variables

Variable A	Variable B	N	Spearman's	P-Value	Strength & Direction	Clinical Interpretation
Duration_Surgery	Blood_Loss_Intraop	35	0.655	0.000	Strong, Positive	Confirms that longer surgery time leads to significantly greater estimated blood loss.
Blood_Loss_Intraop	Hgb_Drop	35	0.569	0.001	Strong, Positive	Higher blood loss during the procedure is strongly and significantly associated with a larger drop in post-operative hemoglobin.
Blood_Loss_Intraop	Postop_Hospital_Stay	35	0.563	0.001	Strong, Positive	Higher blood loss is a major driver of

						significantly longer post-operative hospital stays.
Blood_Loss_Intraop	Days_Drain_Removal	35	0.443	0.008	Moderate, Positive	More blood loss is moderately associated with delaying the removal of the drainage tube.
Duration_Surgery	Postop_Hospital_Stay	35	0.385	0.021	Moderate, Positive	Longer surgery duration contributes moderately to longer post-operative hospital stays.
Postop_Hospital_Stay	Days_Drain_Removal	35	0.380	0.023	Moderate, Positive	Patients who stay longer in the hospital also tend to have their drainage tube removed later.
Prostate Size	Duration Surgery	35	0.347	0.040	Moderate, Positive	Larger prostate size is moderately associated with longer duration of surgery.
Postop Hospital Stay	Total Drain Output	35	0.339	0.045	Moderate, Positive	Greater total drain output is associated with longer hospital stays.

Does all TVP group patients having SPC intraoperatively contribute for long hospital stay and increased post-operative complications?

Outcome	Test Performed	SPC(+) Median/OR	SPC(-) Median/Ref	P-Value	Conclusion
Postoperative Hospital Stay (Days)	Mann-Whitney U Test	Median: 6.0	Median: 6.0	0.540	No significant difference in the length of hospital stay between the two groups.
Minor Complication Rate	Logistic Regression	OR: 0.90	Reference: No SPC	0.908	No significant association between SPC use and the odds of having a minor complication.

6. Discussion

The objective of this study was to compare the perioperative and postoperative outcomes of **TVP** vs **RPP** for surgical management of BOO secondary to BPH. The results shows advantages for the **RPP in terms of perioperative safety and postoperative efficiency**, while short-term quality-of-life and outcome appears no significant difference in both groups.

This study significant finding is the independent protective effect of the RPP technique across multiple measures of surgical morbidity and recovery. After adjustment for critical baseline confounders such as patient age and pre-operative hemoglobin (Hgb) level, RPP was associated with:

- A **significantly lower postoperative Hgb drop** (1.5 g/dL lower, $p=0.006$), confirming reduced overall blood loss and quicker hematological recovery.
- A **significantly lower rate of blood transfusion** (TVP 11.1% vs RPP 5.9%, $p=0.016$).
- A **significantly shorter post-operative hospital stay** (1.6 days shorter, $p=0.016$).
- Significantly lower complication rates (Overall, TVP 55.5% vs RPP 11.6%, $p=0.005$).
- A significantly **earlier removal of the surgical drain** (1.6 days earlier, $p=0.001$), highlighting superior surgical efficiency.

These findings are strongly supported by comparable literature [14, 15, 16]. Studies comparing open RPP to TVP consistently report that the **Retropubic approach leads to less postoperative bleeding, shorter hospital stays, and quicker recovery milestones** [14, 15]. The advantage of the RPP technique is often attributed to the ability to achieve more precise **hemostasis on the prostatic fossa without opening the bladder** thereby reducing the incidence of immediate post-operative bleeding complications like clot retention [13, 16] (which was also significantly higher in our TVP group: 55.5% vs RPP 11.6%, $p=0.025$).

There is no statistically significant difference in the total duration of surgery between the RPP (mean 121.76 min) and TVP (mean 131.39 min) groups ($p=0.449$). This suggests that for a skilled surgical team, the choice of open approach does not impose a substantial impact on operating room time. Similarly, while RPP showed a trend towards less estimated intraoperative blood loss (mean difference of 227 mL), this difference was not statistically significant in the multivariate model, a finding that is sometimes mirrored in randomized studies where the primary difference is observed in postoperative blood management (drainage, transfusion rates), not the estimated loss during the procedure itself [15].

The short-term outcomes of Patient Satisfaction and LUTS Improvement were similar between the two groups in the multivariate analysis.

In our analysis, the differences in these outcomes, observed in the univariate stage, were largely attenuated and became non-significant after controlling for patient comorbidity. This highlights that the ultimate success of the surgery, in terms of patient-reported quality of life, relies heavily on the patient's baseline health status rather than the specific type of open prostate surgery performed.

This finding aligns with the general consensus that both open approaches, even though it is short term follow up, provide **excellent, significant relief from BPH symptoms** [13, 16]. Literature comparing these two techniques for BPH typically reports similarly effective long-term functional results, including IPSS reduction and improvement in flow rates, reinforcing the idea that both RPP and TVP are highly effective solutions for large prostates.

The current practice patterns in surgical management of BPH confirm that **TURP** (Transurethral Resection of the Prostate) remains the standard for small to medium-sized glands, while **open surgery (OSP)** is reserved for patients with large prostatic adenomas [9]. The primary reason is the higher perioperative morbidity (blood loss, LOS) of OSP compared to TURP. Our finding that RPP significantly reduces morbidity compared to TVP is critical, as it demonstrates that the choice of open technique can mitigate the inherent risks associated with OSP.

However, contemporary trends are moving away from OSP towards minimally invasive techniques like **Robotic-Assisted Simple Prostatectomy (RASP) and endoscopic enucleation** for large glands [10, 11]. Studies comparing these advanced endoscopic methods to open surgery, consistently show that they achieve the same **excellent long-term functional results** (durable IPSS improvement and flow rates) as open surgery, but with **significantly reduced estimated blood loss (EBL) and shorter hospital stays** [11].

Thus, while our results show RPP as relatively the safer and more efficient choice within the open simple prostate surgery technique, the broader literature confirms that MISRP currently offers the most favourable balance of high efficacy and low morbidity for treating large BPH [10].

Table 10 Comparative Outcomes Across BPH Surgical Techniques

Outcome Parameter	TVP (our Study)	RPP (our Study)	TVP [17, 19]	RPP [17,19]	TURP [11, 17]	HoLEP [11, 17]	RSP/LSP [18, 19]
Gland Size Indication	Large (Mean 82 mL)	Large (Mean 90 mL)	Large (>75 mL)	Large (>75 mL)	Small/Medium (30-80 mL)	All Sizes (>80 mL common)	Large (>80 mL)
Duration of Surgery (min)	Around 131	Around 122	90 - 150	120 – 180	Shorter (60-90)	Longer (120 to 180+)	Longest (180 to 240+)
Intraop Blood Loss (EBL)	High (Around 475 mL)	High (Around 382 mL)	High (400-600 mL)	High (300-500 mL)	Moderate (150-250 mL)	Lowest (50-100 mL)	Low (100-200 mL)
Hgb Drop (g/dL)	Highest (Around 2.4)	High (Around 1.2)	Highest (2.5 - 3.0)	High (1.5 - 2.0)	Moderate (1.0-1.5)	Lowest (0.5-1.0)	Low (0.5-1.0)
Transfusion Rate	Inferred High (11.1%)	Inferred Low (5.9%)	High (15% - 25%)	Moderate (5% - 10%)	Low (2-5%)	Lowest (<1%)	Very Low (<1%)
Clot Retention Rate	Around 5.6%	0.0%	Higher (up to 30%)	Moderate (1-5%)	Low (2-5%)	Low (1-3%)	Very Low

Postop Hospital Stay (days)	Long (Around 6.7)	Long (Around 5.7)	Long (5 - 7)	Moder ate (3 - 5)	Short (1-4)	Shortest (1-2)	Short (2- 4)
Overall Complic ation Rate (Major Risk)	Moderate (Bleeding/Rec overy)	Moderate (Bleeding/Rec overy)	High (Bleed ing, Strictu re)	Moder ate (Strict ure)	Moderate (Reoperation/St ricture)	Low/Mod erate (Tempora ry Incontin ence)	Low/Mod erate (Longer Anesthesi a/

*TVP- transvesical prostatectomy RPP- retropubic prostatectomy TURP- transurethral resection of prostate
HoLEP-Holmium Laser Enucleation of the Prostate RSP/LSP-Robotic/Laparoscopic simple prostatectomy*

7. Conclusion and Recommendation

The RPP technique is superior to TVP in the immediate postoperative period, demonstrating a lower Hgb drop, fewer complications, and a shorter hospital stay, independent of key patient characteristics. Both techniques, however, offer similar effective functional outcomes, with patient comorbidity being a crucial predictor of overall patient satisfaction and symptom improvement. These data suggest that RPP should be considered for open approach in BPH management when an open procedure is the only option.

7.1 Limitations of study

- Small sample size
- Single institution based
- Short Follow-Up Duration
- Non Standard outcome measures(outcomes measured subjectively)
- Quasi-random allocation instead of true randomization

Its small sample size restricted our ability to perform stable multivariate logistic regression on low-frequency binary events, such as complications classified by Clavien-Dindo score, requiring us to rely on Chi-squared tests for these outcomes.

Despite these limitations, the consistency of the findings across multiple objective metrics and their alignment with established literature strengthens the conclusions regarding the superior safety profile of the RPP approach.

7.2 Recommendation

- Adopt RPP as the preferred open technique for BPH
- Focus on training residents on RPP
- Conduct Larger, Multi-center Cohort Studies

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Annex

Perioperative outcomes of RPP/TVP for BPH patients undergoing open prostate surgery,
Menelik II Hospital experience prospective cohort institution based study

CONSENT FORM

My Name is Abiy Tadele Alene ,I am final year urology resident .Me and my colleagues are conducting research on comparison of TVP/RPP for simple open prostate surgery. The research will provide important information for improvement of future care of our patients. I will brief you details on advantage and disadvantage and technical difference of each procedure. Both procedures are standard procedures for management of BPH. Researches abroad showed almost comparable outcomes slightly RPP perioperative safety .This research aims in comparing both techniques in our set up. The research includes before surgery, during surgery after surgery and follow up engagement.

Yes I accepted and participant in research-----

☐

No I decline invitation-----

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Indications for surgery

A-Failed medical mgt

B-Upper tract injury

C-Failed TWOC

D-Patient preference

E-other (Specify)_____

PROCEDURE type

A. RPP

B. TVP

MRN_____		Phone no._____	
<i>1-Socio-demographic data</i>			
Age_____			
Occupation	1. Farmer 2. Civil servant in gov't office or NGO 3. Private work 4. Merchant 5. Daily laborer 6. Others		
Marital status	1. Single 2. Married 3. Divorced 4. Widowed		
Region	1. AA 2. Oromia 3. Amhara 4. SNNP 5. Other(specify)-----		
Religion	1. Muslim 2. Orthodox 3. Protestant 4. Other_____ -		
<i>2-Baseline Clinical Characteristics</i>			
Co morbidity	1. No 2. HTN 3. DM 4. Cardiac 5. CKD 6. Neurologic disease 7-Other_____		
Medication history(Antiplatelet/anticoagulant)	A-YES B-N0 If yes specify duration of intake _____ total days discontinuation before surgery _____ medication type _____ Dosage _____		
Habits	1. No 2. Alcohol 3. Cigarette Smoking (pack year) 4. Chat 5. Other		
Symptoms	1- IPSS score(severity of LUTS) (mild)(moderate)(severe) 2- Specific LUTS complaints a-poor streaming b-dribbling c-Nocturia if yes frequency per night_____ d-urgency e-incontinence(specify type if yes)_____ f-haematuria		

	g-other_____ 3- Duration of symptoms_____ 4- Medical management for BPH A-yes B- No_____(specify medication)_____ B-Duration of Management_____ C-Response (subjective), none, fair, good D-if had good response reason for opting surgery _____ 5-Episode of AUR___A-yes B-No A-TWOC trial A-not tried ___ B- successful _____ C-failed _____ if failed total duration pt on catheter_____
Physical examination	1- Performance status(ECOG)_____ 2- Bp _____ 3- Digital Rectal examination_____ 4- Neurologic Examination(gross deficit)_____

3-Investigation Assessment		
Pre-Operative		Post-operative
WBC		
Hgb		
PLT		
UAA		
Urine culture		
RFTCr/Urea		
PSA(total or free)		

4- Imaging	
Abdominopelvic U/s done by expert	1- Prostatic Size_____ 2- Median lobe_____ 3- Hydronephrosis_____ 4- Bladder change_____ 5- Other_____ -
Cystoscopy report (if any)	
5-Intra op Assessment	
Type of Anesthesia	A-SA_____ B-GA_____ C-other _____
Abdominal Approach	A-Lower midline Vertical_____ B-pfannenstiel incision_____
Intra op BP(range)	
Total duration of Surgery(Incision To skin closure)	
Estimated blood loss(in ml)	
No fluid used for irrigation (intra op) in bags/ml	
Catheter Use	A-Trans urethral catheter_____ Fr balloon inflation size in cc_____ B-SPC use _____ if yes day of removal_____
Additional procedure(s)	If yes type of surgery _____ duration of surgery _____ blood loss_____

Intra op transfusion	A-yes B- No if yes type of blood and Unit_____						
6-Post op Assessment							
Irrigation required	A-No.Normal saline (in bags/ml)_____ B-Total days of irrigation required_____						
Drainage	A-Daily output(in ml) I-Day1_____ II-Day 2_____ III-Day3_____ specify if beyond_____ B-Day of removal a-1 st POD b-2 nd POD c-3 rd POD d- Other(specify)_____						
Vital signs in the wards(put it in range)	Bp_____PR_____						
Complications during hospital stay	A-yes B-no C-If yes A-DVT B SSI C-HAP D other Specify_____						
Any episode of clot retention	A-Yes B-No C-If yes no. of episode_____						
Total No.pts hospital stay(in days)							
Total no. of post op Hospital stay(in days)							
Medications on discharge	A -yes B –NO if yes specify_____						
7-OPD follow up							
Day of first clinic visit after Surgery(no. days after surgery)							
Any complications like SSI,UTI,pneumonia	A-Yes B-No C-If yes specify_____						
Day of transurethral catheter Removal(no. days after surgery)							
No. of days after operation during 2 nd time visit to clinic							
Complications during 2 nd visit identified	A-yes B-no if yes specify_____						
Post op Symptom improvement compared to pre op tick on provided table on the right 1-Satsfactory 2-good improvement 3-fair improvement 4-same 5-wosened 6-no such symptom pre op		1	2	3	4	5	6
	Urine stream						
	Nocturia						
	Urgency						
	Dribbling						
	Incontinence						
	Hematuria						
Patient satisfaction	1-very satisfied 2-satisfied 3-fairly satisfied 4-neutral 5-dissatisfied						