

Research Article

Endoscopic Surgery from Single Urologic Centre: One Year Experience in Cystoscopy and Monopolar Transurethral Resection of the Prostate

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Abstract

Background: Prostate research interest has long arisen due to its hormone dependence, remarkable secretions and potential for neoplasia. This study evaluated monopolar transurethral resection of the prostate done for benign prostate enlargement at a private urologic centre in Port Harcourt. **Materials and Methods:** A prospective observational (descriptive) study was carried out among patients who had cystoscopy and monopolar transurethral resection (TURP) of the prostate for benign prostate enlargement at the study centre from January 2024 to December 2024. The data obtained was entered into excel spreadsheet and formed into tables and graph. **Results:** Eighty-seven transurethral resections of the prostate were carried out. The ages of patients ranged from 50-93 years, and the mean was 72.6 years. The mean duration of surgery was 57.34 minutes, and ranged from 50 and 79 minutes for 49 (56.3%) patients. The mean prostate weight was 80.02 grams, with a broad range of 40 to 159 grams. The weight of resected specimen ranged from 20 to 123 grams, and the mean was 53.4 grams. The mean duration of hospital stay was 3.22 days, and had a range of 2 to 4 days in 95.4% of the patients. There was a complication-free rate of 94.3% (n = 82), urinary incontinence in 2.3% (n = 2), and clot retention in 1.1% (n = 1). **Conclusion:** The mean weight of resected specimen was almost twice the size of an average normal adult prostate. The procedure was completed in less than an hour in most patients, and they were discharged with 2-4 days without complications.

Keywords

Monopolar, Single Centre, Trans-Urethral Resection of the Prostate, Port Harcourt, Nigeria

1. Introduction

The prostate gland is an accessory male sex organ that contributes to the propagation of the human race. Located between the urinary bladder neck and the urogenital diaphragm, it is a rounded structure through which urine transits from the urinary bladder to the tip of penile shaft [1]. It

comprises the transitional, central, and peripheral zones. Interest in the prostate research has long arisen due to its hormone dependence, remarkable secretions and potential for neoplasia [2]. While it carries out its functions silently without obviously being noticed, its presence often become no-

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ticeable when diseased – as in prostate enlargement. Its alkaline fluid contributes 20–30% of seminal fluid volume [3]. The surgical procedure in which the obstructing central zone of the prostate is excised through the urethral route is transurethral resection of prostate (TURP). This is often achieved through high energy monopolar, bipolar, and plasmakinetic resection [4, 5].

Transurethral resection of the prostate, has been possible through the hard work of previous researchers. Although there were earlier names from 1830 like George Guthrie and Enrico Bottini, Maximilian Stern in 1926 invented the modern resectoscope [6, 7]. TURP is credited to the earlier works of Hugh Hampton Young – 1909 and 1911, the “Father of American Urology” [6]. Joseph McCarthy in 1931 added a gear system and improved on the lens, while the “pistol grip” was created by Reed Nesbit in 1939 [6]. Thereafter, had been several improvements in the equipment and instruments, leading to the varieties available to the urologist today. Although there are some degree of heterogeneity, TURP is now a universal gold standard procedure for benign prostate enlargement [8, 9]. There are also multiple studies highlighting TURP done in many centres in Africa [10–12], and in Nigeria [13–15]. Many irrigation fluids have been used: 5% dextrose water [15], sterile water [16], and others (1.5% glycine, mannitol, 3.5% sorbitol) [17, 18]. Isotonicity, non-toxicity, non-hemolytic, not absorbable, not metabolized, sterile, inexpensive, transparency - for clear visualization, non-conductivity are the desirable qualities of an ideal irrigation fluid [19]. However, no single fluid has fulfilled these criteria.

Transurethral resection of the prostate, a minimally invasive surgically procedure, is technologically-based and so requires specialized equipment/instruments and training. A report on the progress of minimally invasive surgeries in the City of Port Harcourt was published in year 2022 [20]. In that study, urologic procedures constituted 32.0% of the 5845 total procedures, and there were 497 TURP carried out from multiple centers over the ten-year period of the study. The aim of this study was to evaluate the procedure of monopolar transurethral resection of the prostate carried out for benign prostate enlargement at a single specialist urologic center in Port Harcourt.

2. Materials and Methods

Research Design: A prospective observational (descriptive) study was carried out.

Study Area: Port Harcourt, the Cosmopolitan Capital of Rivers State in Nigeria, was the study area.

Study Setting: The setting was a private urological centre in

the city of Port Harcourt.

Study Population: Patients who had monopolar transurethral resection of the prostate for benign prostate enlargement at the study centre from January 2024 to December 2024 constituted the study population.

Sample Size Determination: All the patients who underwent monopolar TURP at the center were included in the study.

Sampling Method: Total population of patients was used.

Study Instrument: A designed proforma was used to capture the details (variables of interest) of the operated patients.

Technique: TURP is the gold standard of care in patients with benign prostate enlargement (BPE) who moderate to severe urinary symptoms. A pre-operative evaluation was carried out including clinical history and examination (including digital rectal examination), Prostate Specific Antigen (PSA) testing, and imaging (e.g., prostate ultrasound). After subarachnoid block/general anesthesia and patient in lithotomy position with intravenous fluid in situ, cleaning and draping was done. A lubricated resectoscope was inserted through the urethra into the urinary bladder, and the urethra, prostate, and bladder were examined (cystoscopy). With the aid of a monopolar electrocautery, a wire loop attached to the resectoscope was used to excise in a clockwise fashion the obstructing prostatic tissue into small chips, from median lobe to the lateral lobes. With the aid of the loop (and ball electrode) hemostasis was secured. Sterile water was used to achieve continuous irrigation for a clear view and to flush out prostatic chips. Thereafter, a three-way Foley's catheter was passed for continuous bladder irrigation for 24–72 hours. Patient was monitored for complications in the immediate post operative period. After removal of urinary catheter, the outcome was evaluated with the patient's urinary flow and symptoms.

Study Variables: This included the age, duration of surgery, duration of hospital stays, size of the prostate and the size of the resected specimen, and the complications encountered.

Reliability of Instrument: The study proforma was scrutinized by the authors for appropriateness/reliability before use.

Bias: None.

Data Analysis: The data obtained was entered into excel spreadsheet and formed into tables.

Ethical Considerations: The approval of the Research and Ethics Committee of the Rivers State University Teaching Hospital and the management of the study Hospital were obtained. Written permission was obtained from each patient, and personal details of the patients involved were not used.

Step 1: Preoperative Preparation

- Patient evaluation
- Obtain informed consent
- Preoperative antibiotics administered
- Anaesthesia (Spinal or General)

**Step 2: Positioning and Setup**

- Patient placed in lithotomy position
- Genital area cleaned and draped under sterile conditions
- Bladder catheterized and irrigated

**Step 3: Endoscopic Access**

1. Insertion of resectoscope through the urethra
2. Continuous irrigation with sterile water or saline to maintain visibility

**Step 4: Resection of Prostatic Tissue**

1. Identification of ureteric orifices and verumontanum
2. Resection starts at bladder neck, moving distally toward apex
3. Tissue chips are cut using monopolar/bipolar loop
4. Resection proceeds circumferentially until obstruction is relieved

**Step 7: Recovery and Follow-up**

1. Stop Continuous Bladder Irrigation when urine clears
2. Remove catheter after 24–72 hours
3. Observe for urinary retention, haematuria, infection
4. Schedule follow-up with uroflowmetry and symptom assessment

**Step 6: Postoperative Management**

1. Insert three-way Foley catheter
2. Initiate continuous bladder irrigation (CBI) to clear clots
3. Monitor urine color and adjust irrigation accordingly

**Step 5: Haemostasis**

1. Use coagulation current to control bleeding vessels
2. Inspect prostatic fossa thoroughly for hemostasis

**Figure 1.** Flow Diagram for TURP.**3. Results**

Eighty-seven monopolar transurethral resections of the prostate were carried out at Colworth Medical Centre, a Consultant Urologic referral centre in the city of Port Harcourt in the year 2024.

Table 1. Age of patients who underwent Unipolar TURP (n = 87).

S/N	Age Range (In Years)	Frequency
1	40-49	0
2	50-59	10
3	60-69	15
4	70-79	36
5	80-89	13
6	90-99	6
7	100-109	0
Mean Age = 72.6 Years		

Table 1 shows the age of patients who underwent monopolar TURP. The ages of patients ranged from 50-93 years, and had a mean of 72.6 years. The patients who were aged 60-89 years constituted 73.6% of the total population, and those aged 70-79 years were the single dominant age range affected.

Table 2. Duration of Surgery for patients who underwent monopolar TURP (n = 87).

S/N	Duration of Surgery (In Minutes)	Frequency
1	20-29	2
2	30-39	11
3	40-49	12
4	50-59	15
5	60-69	23
6	70-79	11
7	80-89	4
8	90-99	2

S/N	Duration of Surgery (In Minutes)	Frequency
9	100-109	1
10	110-119	0
11	120-129	1
12	130-139	0
13	140-149	1
Mean Duration of Surgery = 57.34		

Table 2 shows the duration of surgery for patients who had monopolar TURP. The duration of surgery for 49 (56.3%) patients ranged between 50 and 79 minutes, and the mean was 57.34 minutes.

Table 3. Prostate Weight for patients who underwent monopolar TURP (n = 87).

S/N	Prostate Weight (in Grams)	Frequency
1	40-49	1
2	50-59	11
3	60-69	13
4	70-79	19
5	80-89	16
6	90-99	8
7	100-109	5
8	110-119	3
9	120-129	2
10	130-139	0
11	140-149	0
12	150-159	1
13	160-169	0
Mean Prostate Weight = 80.02 grams		

Table 3 shows the prostate weight for patients who underwent monopolar TURP. The mean prostate weight was 80.02 grams, with a broad range from 40 to 159 grams. Sixty-six (75.9%) patients had their prostate weight between 50 and 99 grams.

The weight of resected prostate specimen for patients who underwent monopolar TURP is shown in Table 4. The weight of resected specimen ranged from 20 to 123 grams, and the mean was 53.4 grams. In 65 patients (74.7%) the weight of resected specimen ranged from 30 to 69 grams.

Table 4. Weight of Resected Prostate Specimen for patients who underwent monopolar TURP (n = 87).

S/N	Weight of Resected Prostate Specimen (in Grams)	Frequency
	<10	0
1	10-19	0
2	20-29	6
3	30-39	18
4	40-49	16
5	50-59	12
6	60-69	19
7	70-79	2
8	80-89	3
9	90-99	3
10	100-109	1
11	110-119	0
12	120-129	2
13	130-139	0
Mean Weight of Resected Prostate Specimen = 53.4 grams		

Table 5. Duration of Hospital Stay for patients who underwent monopolar TURP (n = 87).

S/N	Duration of Hospital Stay (in Days)	Frequency
1	1	Nil
2	2	15
3	3	40
4	4	28
5	5	1
6	6	Nil
7	7	1
8	8	Nil
Mean Duration of Hospital Stay = 3.22		

Table 5 shows the duration of hospital stay for patients who underwent monopolar TURP. The mean duration of hospital stay was 3.22 days. In 83 patients (95.4%) the duration of hospital stay ranged from 2 to 4 days.

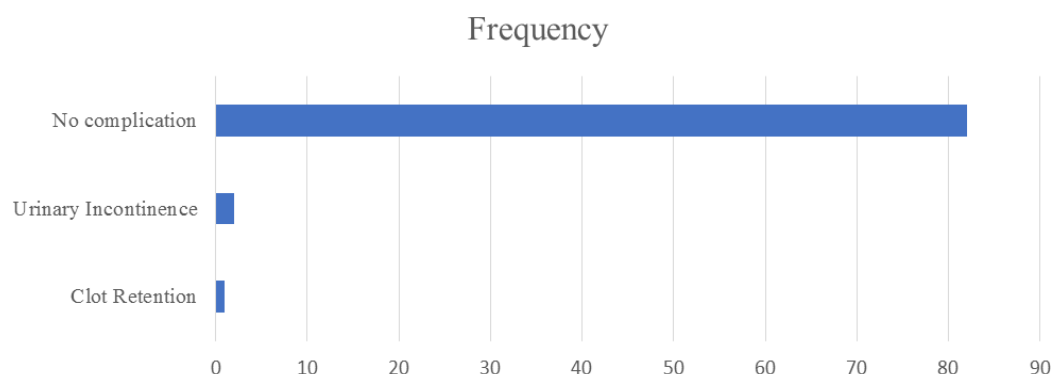


Figure 2. Postoperative Complications for patients who underwent monopolar TURP (n = 87).

Figure 2 shows the postoperative complications seen among patients who underwent monopolar TURP. Eighty-two patients (94.3%) had no complication following the procedure. Two patients (2.3%) had urinary incontinence, and 1 patient (1.1%) had clot retention.

4. Discussion

Minimally invasive surgical practice has faced some challenges in the low income setting due to cost and availability of instrument and trained personnel among others [21]. Although in current global practice there are other useful minimally invasive techniques that could serve the purpose such as Water Vapor Thermal Therapy (Rezüm) [22, 23], Prostatic Artery Embolization (PAE) [24], Prostatic Urethral Lift (UroLift) [25, 26], and Laser-Based Procedures [27], the skills and instruments/equipment for transurethral resection of the prostate (TURP) were available in our area of practice. Additionally, TURP is still in the current arsenal of the minimally invasive surgeon with its unique advantages – efficacy, tolerability and safety, with a strong Ia level of evidence rating [28]. In a review of the management of benign prostate hyperplasia in Africa it was also reported that open prostatectomy is still quite popularly carried out [11]. While a city-based report in Port Harcourt had chronicled the progress in minimally invasive surgery done mostly in private healthcare facilities some three years ago [20], this number is therefore reasonable and commendable that this number of specialist urologic procedures is coming from a single private centre within a period of a year, implying some progress in the city of Port Harcourt. The number (87 cases) of monopolar TURP is relatively higher than that reported from a Teaching hospital in Northern Nigeria [29], and the 20 TURPs reported in a Kidney Transplant Centre in Abuja, Nigeria over a period of 18 months [30]. The relatively higher number of cases seen in our report for single procedure speaks of the increasing experience of urologic minimal invasive surgery practitioners in Port Harcourt. The mean age of 72.6 years observed among our patients is higher than the 67.4 years reported in Maiduguri Nigeria [10], and the 67.07±9.38 documented in Jos Nigeria [31]. However, it is similar to an Ibadan study that

observed 76±8 years [32].

The prostate weight of the patients varied from twice to 6 times the normal weight in adults (20-25 grams), and had a mean of 80.02 grams. This mean size of the prostate is higher than what was observed in other Nigerian studies – Jos, Imo, Enugu [15, 31, 33, 34]. However, there are other Nigerian studies that expressed the prostate size in volume [16]. The reasons for the differences could be ethnicity and geographical factors (migration) which have been known to affect the growth of the normal human prostate [35, 36]. The mean weight of resected specimen was 53.4 grams, and in 74.7% of the patients it ranged between 30 to 69 grams. This observed value is greater than the mean value reported in a review article [37], mean resected weight of 18.4 grams documented in Maiduguri Nigeria [10], 36.5±12.1 g reported from Abuja North-Central Nigeria [13], and 30.10 g in Enugu South Eastern Nigeria [15]. However, our study share some similarity with the documented resected specimen of 20 ± 68 g in TURP reported in Kinshasa, Democratic Republic of the Congo, where duration of surgery was also found to correlate with the size of resected specimen [12]. Regardless of the mean prostate size, more than half of the patients in our study had their surgeries completed in less than an hour, and the mean duration was 57.34 minutes.

Shorter duration of hospital stay is a key advantage of minimally invasive surgery: the short hospital stay and early return to work which enables the patient to be productive to sustain livelihood; no scar of surgery and therefore no need for frequent wound dressing; and no need for blood transfusion. These and many more can be so cumbersome in the public health institutions. The mean duration of hospital stay in this study was 3.22 days, and the range was 2 to 4 days in 83 patients (95.4%). This is comparable to the duration of 61.14±27.13 (hours) reported from Jos Nigeria [31]. The mean duration of hospital stay was shorter than the observations in some other Nigerian studies [10, 33, 34], and however longer than the mean of 2.4 days in 80% of cases reported in Kinshasa DR Congo [12], and the day case study from Ibadan Nigerian study [32]. It has been observed that older age of patients, use of general anaesthesia, size of resected specimen, and longer duration of use of urethral catheter are statistically significant factors associated with prolonged hospital

stay following TURP [38]. Among the patients in this study, although the mean age of the patients and the size of resected specimen were relatively high, regional anaesthesia was used. This may account for the early discharge and reduced hospital stay observed.

Although urinary incontinence was seen in 2.3% and clot retention in 1.1% of patients, a complication-free rate of 94.3% is very significant. For the urinary incontinence we started the patient on kegel exercises and reduced fluid intake at nights. Also gave anticholinergics and patient got better on average of 4 months post TURP. Clot retention has a check cystoscopy with clot evacuation done. Few patients had the bleeding point coagulated. The complication rate of 5.7% in this study is lower than the observed 16.7% in Maiduguri Nigeria [10]. The TURP syndrome described in a sister institution in Port Harcourt was not experienced among the patients [19]. Our experience of 1.1% clot retention was less than the 1.8% reported in a study for a similar procedure in northern Nigeria [13]. However, ours was not associated with uncontrollable haemorrhage as seen in a Maiduguri Nigerian study that necessitated conversion to open surgery [10]. Our report of urinary incontinence seen in 2.3% of the patients is less than the value of 30–40% documented for early urge incontinence at a centre in Germany [39]. However, that German study was reported 19 years ago, and there may have been improvement in the procedure over the years.

Study Limitations: This is a single center study with a small sample size. It is however, a documentation of a great experience for a private setting in a low income setting where minimally invasive surgical procedure is being encouraged. The outcome of long term follow up is not provided.

5. Conclusion

The mean weight of resected specimen was almost twice the size of an average normal adult prostate. The procedure was completed in less than an hour in more than half of the patients, and they were discharged with 2-4 days very minimal complications seen among 3.4% of the patients' population. This success story from a private establishment has the potential of attracting medical tourism, and therefore calls for deliberate effort/incentives to be provided by governments and non-governmental agencies to encourage the development of minimally invasive surgical procedures to be provided to the public by Nigerian specialists.

Abbreviations

TURP	Transurethral Resection of the Prostate
BPE	Benign Prostate Enlargement
PAE	Prostatic Artery Embolization
UroLift	Prostatic Urethral Lift

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Conflicts of Interest

The authors declare no conflicts of interest.

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