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Efficacy and Safety Outcomes of Monopolar Transurethral Resection of the Prostate in Abuja, Nigeria

Muftau Jimoh Bioku[1, *], Ayoleke Ogunrinde[2], Emmanuel Ugwu[3], Olatunde Olawoye[3], Izuchukwu Benerdin Achusi[4], Quadri Sanni[1], Ahmed Saad Aliyu[4]

[1]Department of Surgery, Federal Medical Centre, Abuja, Nigeria

[2]Urology Unit, Department of Surgery, Apirlam Hospital, Abuja, Nigeria

[3]Department of Anaesthesia, Federal Medical Centre, Abuja, Nigeria

[4]Department of Anatomic Pathology, Federal Medical Centre, Abuja, Nigeria

Email address:

mbioku@gmail.com (M. J. Bioku)

[*]Corresponding author

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Abstract: *Introduction:* Benign prostatic hyperplasia (BPH) is the most common disease in older men. Its clinical manifestations as lower urinary tract symptoms (LUTS) negatively impact patients' quality of life. Transurethral resection of prostate (TURP) has held a unique position as the front-line endoscopic treatment of BPH for many decades in developed nations. However, there are few literatures on its use in this environment. *Objective:* To document the 5-year efficacy and safety outcome of monopolar TURP for the treatment of the LUTS secondary to BPH at Federal Medical Centre (FMC), Abuja. *Patients and Methods:* A retrospective study of all men who had monopolar TURP with histologic confirmation of BPH between June 2016 and May 2021. The information retrieved includes age, prostate specific antigen (PSA), preoperative and postoperative International Prostate Symptom Score (IPSS), ultrasound prostatic weight, post-void residual (PVR), indications for TURP, operation time, postoperative complications, and histological reports. These data were analyzed using SPSS version 27.0. *Results:* A total of 142 patients who had M-TURP met the inclusion criteria. The age range was 49-88 years with a mean of 66.04 years. The mean Prostatic weight was 61.27g (range 21-81g) while serum PSA ranged from 1.0 to 10.1ng/ml (mean = 3.73 ng/ml). The average operation time was 59.29 minutes (range= 46-73 minutes). The most common indication for TURP was recurrent acute urinary retention (n=65,45.8%) while bleeding is the leading complication (n=9, 6.3%). There was no TUR syndrome or intraoperative death. However, the transfusion rate was 6.3%. We recorded improvements in IPSS from 21.53 to 3.43. Histological reports revealed BPH only in 82.4% of cases (n= 117) and BPH with prostatitis in 17.6%(n=25). *Conclusions:* With appropriate patient selection and organized resection technique, monopolar TURP is a feasible, safe and effective surgical option in the management of BPH-related LUTS.

Keywords: TURP, Prostatic Hyperplasia, Patient Selection

1. Introduction

Benign prostatic hyperplasia (BPH) is the most common disease in older men [1]. Its clinical manifestations as lower urinary tract symptoms (LUTS) negatively impact patients' quality of life [2]. Hitherto, the modalities of management of this pathology had included watchful waiting, minimally invasive procedures, and open surgery. The discovery of drug treatment and new technologies has changed which options are elected.

In contemporary practice, the legitimate indications for operative intervention tend to be contracting than 20 to 30 years ago [3]. These include moderate to severe or bothersome symptoms related to BPH that interfere with patient quality of life, failed medical therapy, refractory urinary retention, recurrent episodes or severe hematuria,

recurrent urinary tract infections, bladder calculi, large bladder diverticula, and azotemia. The main goal of surgery is to relieve the vesical outflow obstruction by the removal of the obstructing hyperplastic prostatic adenomatous mass [4].

In open prostatectomy, which is often recommended for a large prostate > 80g [5, 6], the obstructive adenoma is bluntly enucleated [7] along a recognized cleavage plane leaving the compressed peripheral prostate tissue to maintain continuity of the urinary tract. However, newer technologies such as transurethral resection in saline (TURis) and holmium laser prostatectomy (HOLEP) which can care for a large prostate are available alternatives but only in very few centers in developing countries like ours [8].

To date, transurethral resection of the prostate (TURP) has been considered the gold standard for the treatment of BPH-related bladder outlet obstruction (BOO) [9-11]. Since its invention in the early 20th century in the USA, TURP had held a unique position as the frontline endoscopic treatment for many decades. However, recently, in Europe and North America, the number of cases of TURP performed has gradually decreased [11-13]. For example, in the USA, TURP accounted for 81% of all BPH surgeries in 1999, while it represented only 39% in 2015 [12]. On the other hand, in Nigeria, the number of conventional TURPs has increased due to increased availability of endoscopic armamentaria and the necessary skills, especially in private health facilities in cities [13-19].

Classical monopolar TURP (M-TURP) is typically performed on prostate glands between 30 and 80 g [6, 19]. The procedure involved using a resectoscope with a curved wire electrode within a rigid tube to remove the prostatic adenoma piece meal up to until the typical fibres of prostate capsule is revealed.

In this study, we retrospectively report a 5-year efficacy and safety result of monopolar TURP for the treatment of the lower urinary tract (LUTS) secondary to BPH at the Federal Medical Centre (FMC), Abuja.

2. Patients and Methods

2.1. The Patients

Following approval of the institution's Health Research Ethics Committee (FMCABJ / HREC / 2021 / 032), case notes and theatre records of all men who had M-TURP at FMC, Abuja, between June 2016 and May 2021 were retrospectively studied. Information retrieved includes Age, Prostate Specific Antigen (PSA), International Prostate Symptoms Score (IPSS)/Quality of Life (QL), Ultrasound Prostatic Volume, Residual Post-Void (PVR), Indications for TURP, Operation time, Postoperative complications and Histology reports.

The preoperative evaluation of all patients included relevant history, physical and digital rectal examinations, urinalysis, complete blood count, serum electrolytes, urea and creatinine, PSA, abdominal and transrectal ultrasound to measure prostatic volume and PVR, chest radiography and echocardiography.

2.2. Inclusion Criteria

All men who had monopolar TURP with histologic confirmation of BPH were included.

2.3. Exclusion Criteria

Patients whose prostatic chips histology reports revealed malignancy were excluded.

2.4. Equipment

The M-TURPs were performed using a standard technique with 26 FG rotatable sheath continuous flow-type Karl Storz resectoscope with cutting loop and 30-degree telescope. The Chinese surgical unite (power-420x) electrosurgical unit with setting at 120W cutting and 80W for coagulation respectively was deployed. Intraoperative continuous irrigation was achieved with sterile water hung at approximate height of 60cm from the bladder level.

2.5. Anaesthesia

All patients received spinal and/or epidural anesthesia.

2.6. Operative Technique

The procedures were performed by a single surgeon and all patients received parenteral prophylactic antibiotics. Prostatic resection was begun from the 5 and 7 o'clock areas. Resection was performed until the prostatic capsule and completed at the apex. Additional hemostasis was secured with the aid of a roller ball. The prostate chips were evacuated using an Ellik evacuator. A 22FG 3-way coude-tip urethral catheter was positioned for continuous bladder irrigation with normal saline if necessary. All patients received intravenous perioperative tranexamic acid 1g slowly.

The catheter was removed and 24 hours after successful voiding, the patients were discharged home. They were followed up in the Urology clinic at 2 weeks, 3 months and 6 months. All patients received oral quinolone for one week after surgery. In the clinics, IPSS/QL and PVR were evaluated and histopathological reports were recorded.

2.7. Statistical Analysis

Data harvested were analyzed using statistical package for social science (SPSS) 27.0 for window. The standard continuous variables were expressed as mean +/- the standard deviation. The probability value of $P < 0.05$ were considered statistically significant.

3. Results

A total of 142 patients who had M-TURP during the study period met the inclusion criteria. Their ages ranged from 49 years to 88 years (mean = 66.04 years +/- 8.07 SD). The mean Prostatic weight was 61.27g (range 21-81g) while the

serum prostatic specific antigen (PSA) ranged from 1.0 to 10.1ng/ml (mean = 3.73 ng/ml, +/- 1.75 SD). The average operation time was 59.29 minutes, +/- 5.12 SD (range= 46-73 minutes).

Preoperative urinalysis, full blood count, renal function, and echocardiographic ejection fractions were normal. However, these parameters were only repeated when clearly indicated postoperatively.

The bar chart represents the spectrum of indications for transurethral resection of the prostate while the complications recorded are detailed in Table 1. There was no TUR syndrome or intraoperative death. However, the transfusion rate was 6.3% (n=9).

We recorded significant improvement in IPSS score (21.53 +/- 2.55SD preoperatively compared to 3.43+/-1.21SD six months postoperatively). Histological reports revealed BPH only in 82.4% of cases (n= 117) and prostatitis PBH in 17.6%(n=25) of the patients, as shown in the pie chart.

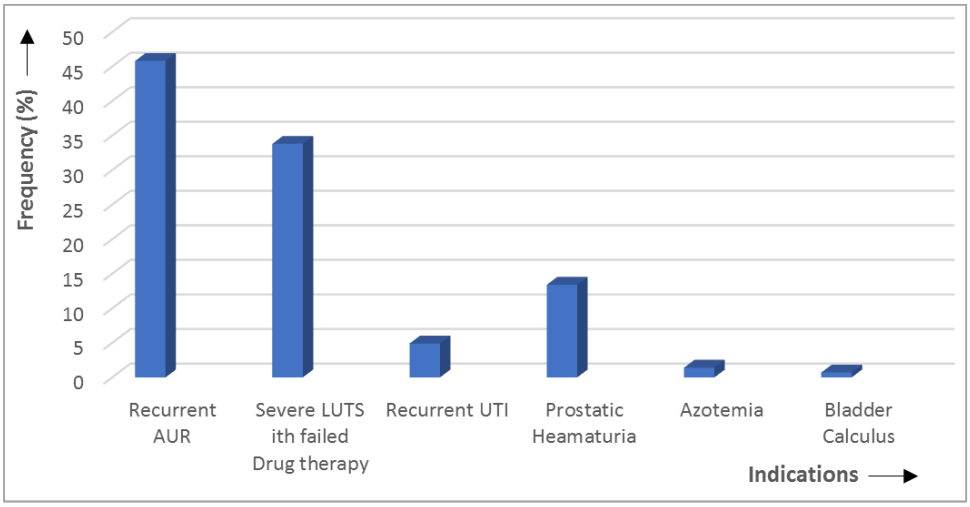

Figure 1. *Indications for M-TURP.*

Table 1. *Complications of M-TURP.*

	Number of patients (%)
HEMATURIA	9 (6.3%)
CAPSULAR TEAR	1 (0.7%)
FAILURE TO VOID	1 (0.7%)
PULMONARY EMBOLISM	1 (0.7%)
UROSEPSIS	6 (4.2%)
ACUTE EPIDIDYMOORCHITIS	1 (0.7%)
Total	19 (13.3%)

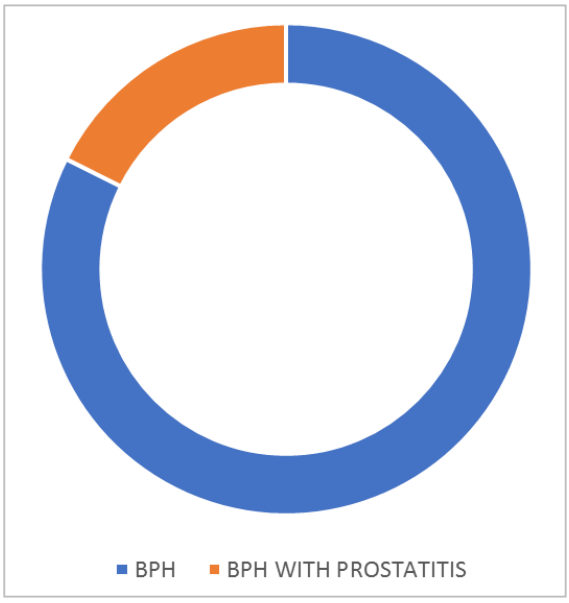

Figure 2. *Histologic outcome.*

4. Discussion

Despite being available since the early 20th century, TURP is still regarded the gold standard for surgical intervention for BPH-related bladder outlet obstruction [8-11]. In resource-poor setting like ours, many hospitals that offer this service deploy M-TURP system [13-20]. This study showed that recurrent acute urinary retention [45.8%] was the commonest reason for the M-TURP while bordersome LUTS unresponsive to medical therapy [33.8%] was the second most common indication for the procedure. However, the European Urology Association (EUA) documented borderline refractory LUTS and severe LUTS as the most common indications for TURP [21].

In this environment, patients are hardly willing to undergo surgical interventions for BPH but only when their quality of life has been significantly impacted by urethral catheterization of the dwelling [15, 16] and /or other complications of neglected long-standing obstruction of the bladder outlet such as hemorrhage, urolithiasis, and hernias of the groin.

We used sterile water as irrigation fluid in all our patients. Although its safety in TURP has been tethered in controversy and has mostly been abandoned in more affluent nations, water is still widely used [20, 22] in low-resource countries due to affordability and availability. Alternative irrigant such as 1.5% glycine is expensive and not readily accessible.

In spite of the choice of this irrigant, there was no TUR-Syndrome in our patients. This may be due to our short

operation time (mean time= 61.3minutes), small prostate sizes selection and the appropriate height of irrigation fluid as well as avoidance of capsular perforation. This was documented in other series [18, 19, 22].

Some of the objective outcome indices of the sufficiency of resection and relief of BOO are resumption of voiding without urethral catheter and reduction in the IPSS score. In this study, all except one patient was voided after catheter removal and we recorded statistically significant improvement in IPSS in those with severe and bordersome symptoms (21.41 vs 3.45) ($p < 0.05$). This was achieved due to proper patient selection as smaller prostate sizes that require surgical intervention are better managed with monopolar TURP. The mean prostate size in our patients was 61.3g (range=21-81g).

One major complication of M-TURP is perioperative bleeding. This may warrant blood transfusion or result in clot retention. The former was reported as 40% in one study [16] while the later has been found to be 2-6.5% in other documents [20, 23]. We recorded 6.3% significant post-operative bleeding necessitating blood transfusion. Our relatively low bleeding rate may be the result of proper intraoperative hemostasis and organized resection. Additionally, some of our patients were on medical therapy with 5-α reductase inhibitors preoperatively, which has been shown to reduce prostatic bleeding [24, 25].

Previous studies showed that patients with indwelling urethral catheter preoperatively are at increased risk of developing post-prostatectomy infective complications [23]. It was reported that this Infection may also occur because of trauma to the prostate tissue during the resection rather than following the removal of a "colonized" urethral catheter [26, 27]. We recorded infectious complications in 7 (4.9%) of our patients, most (85.7%) of whom were from those with preoperative catheters. This is similar to the work of Okhawa et al., who also demonstrated that periprostatic surgery urinary tract infection was more prevalent in patients with preoperative bacteriuria than those with sterile urine [28].

Regarding thromboembolism after TURP, Donat et al. in a retrospective analysis of 883 post-TURP patients found 0.45% cases of pulmonary embolism [29]. This is also corroborated by Zhihuan et al [30]. Similarly, Clinical thromboembolic complication was documented in only one (0.7%) of our patients. This developed despite early ambulation and application of TED stocking prophylaxis. However, it was not fatal. His D-Dimer was elevated and computed tomography lung angiography revealed features of left pulmonary embolism with associated atelectasis. The patient recovered after five days in the intensive care unit.

The co-existing pathology with the benign prostatic hyperplasia post-TURP specimen was chronic prostatitis (17.6%). This contrasts the finding of 26.3% in other study [31].

The timing of catheter removal post-TURP varies from one study to the other. Prasopsuk et al.. found some key determinants for successful catheter discontinuation, such as the level of education and compliance of patients, as well as the presence or absence of intraoperative complications such as bladder perforation, capsular injury, and bleeding [32]. However, recent work has documented catheter removal on post-TURP day 2, postoperative day 1 and day-case prostatectomy in carefully selected patients [33-35]. In our series, we recorded an average of 3.6 days for catheter removal.

5. Conclusion

Our data indicate that with appropriate patient selection and organized resection technique, conventional monopolar TURP is a feasible, safe and effective surgical option in the management of BPH-related BOO. The added merits of "scarlessness", short hospital stay and early recovery make the procedure even more attractive.

Conflict of Interest

The authors declared that they had no competing interests, either financial or non-financial.

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