

Bipolar Transurethral Resection of the Prostate (B-TURP) Including Large Prostate Glands in Kinshasa, DR Congo

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Abstract

Context: In DR Congo, prostate adenoma was treated solely by open surgery till the practice of minimally invasive surgery in 2012. Surgical management of large prostate glands has greatly improved over the last years. Even if open adenectomy is indicated for prostate glands > 80 ml, TURP is currently the gold standard. We report the resection time of TURP procedure, quality of life of the patients, the postoperative complications and outcomes of 152 patients with large prostate glands who went under Bipolar TURP from 2021 to 2022. **Patients and Methods:** This is a prospective and evaluative study of 152 patients who underwent surgery for benign prostatic hyperplasia (BPH) from January 2021 to December 2022 using bipolar transurethral resection of the prostate (TURP). The study variables were age, low urinary tract symptoms (LUTS), paraclinical parameters, prostate volume, resection time, length of hospital stay, results of histopathological analysis of resected tissues (prostate chips), complications and postoperative outcomes of the patients. All the patients underwent saline bipolar TURP. **Results:** The mean age of the patients was 66.5 ± 9.3 years. Dysuria and acute urinary retention were the most predominant symptoms, 46.1% and 23.03% respectively. Arterial hypertension

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was the most common medical history (29.7%), or associated with diabetes mellitus (18.4%). The most frequent surgical history was the repair of the inguinal hernia in 21.7% of cases. Most of the patients had a prostate volume ≥ 80 ml ($n = 91$) in a relative frequency of 60% of cases. The mean prostate volume was 104.8 ± 60.4 ml. The volume of the prostate was correlated with the age of the patients ($r = 0.321$; $p < 0.001$). Most prostate glands were resected within seventy-five (75) minutes. The resection time was correlated with the volume of the prostate ($r = 0.467$; $p < 0.001$). However, the largest prostate gland measured by intrarectal ultrasound weighed 350 ml and was resected in 110 minutes. There was no correlation between the volume of the prostate and the resected tissues by bivariate analysis ($r = 1.000$; $p < 0.001$). The average volume of the resected tissue in our series is 20 ± 68 g (Ranges: 12 - 45). Histopathological analysis revealed fibro adenomatous hyperplasia (FAH) in 70% of cases; BPH was associated with urothelial carcinoma of the bladder and carcinoma of the prostate in 4% and 2% respectively. Uroflowmetry revealed that 86.3% of the patients had a dysuric curve preoperatively, compared to only 4% of patients postoperatively. The difference is significant with $p < 0.05$. 119 patients (86.3%) had a $Q_{max} < 15$ ml/s preoperatively, with significant improvement, $Q_{max} > 15$ ml/s (96%) postoperatively. The post-void residual (PVR) was significant in the group of patients with prostate volume ≥ 80 ml ($p < 0.008$). Preoperatively, 70% of patients had severe symptoms that were improved three months after the Bipolar TURP (74%). The improvement in quality of life depended on the severity of the symptoms; it was faster for mild and moderate symptoms and slow for severe symptoms. After three months postoperatively, the International Prostate Symptom Score (IPSS) and the quality of life (QOL) index were improved in 112 patients (74%).

Conclusion: Although conventional surgery (open adenectomy) has been a standard treatment for large prostate adenomas, progress in minimally invasive techniques, mainly Bipolar TURP, seems to confer more advantages such as the low rate of complications, reduced length of hospital stay and improved quality of life for the patients.

Keywords

Bipolar TURP, Large BPH, Quality of Life, Complications

1. Introduction

Lower urinary tract symptoms (LUTS) are common [1] [2] [3] [4]. Benign prostatic hypertrophy (BPH), also called benign prostatic hyperplasia, is the increased prostate volume without clinical signs of malignancy, causing variable degrees of obstruction to bladder emptying. It is the main pathology causing urination disturbance in elderly men. It is the most common benign tumor in men around fifty years and over [5] [6] [7], and is the leading cause of lower urinary tract symptoms (LUTS), even if these symptoms vary greatly from one individual to another. Large BPH is defined as having a volume ≥ 80 ml [1] [8].

Transurethral Resection of the Prostate (TURP) is a surgical procedure which consists of resecting the prostate in chips through urethra, using an endoscope and under visual control. It is the gold standard for surgical treatment of BPH with a volume less than 80 ml. Bipolar TURP differs from traditional monopolar TURP by the use of a double electrode allowing electricity output to the generator, and therefore the use of 0.9% physiological saline instead of glycol. There is no risk of TURP syndrome [9] [10].

Bipolar transurethral resection has been developed in recent years to minimize current flow absorbed by the patient. This method is characterized by the placement of the neutral electrode in the right proximity of the conductive electrode. Since the irrigation solution (saline) produces extremely lower resistance than the one of tissues, a direct flow of current from the active electrode to the neutral electrode would occur when producing energy. A thermal effect would then be excluded. Some authors compared the results of bipolar TURP with other minimally invasive surgery techniques (HoLeP, Holmium) and open surgery and then concluded that TURP and HoLeP are feasible alternative to resect large BPH, improving the quality of life of the patients [9] [11] [12] [13].

The objective of this study is to evaluate the resection time, quality of life, the postoperative complications and outcomes of the patients with large prostate glands who underwent Bipolar TURP.

2. Patients and Methods

This study was performed at the University Hospital of Kinshasa and Pointe-à-Pitre Clinic in Kinshasa from January 2021 to December 2022. We used study questionnaire for qualitative variables that were age, marital status, symptoms (LUTS), medical and surgical history, IPSS score and quality of life index (QOL). All patients were diagnosed with symptomatic BPH according to International Prostate Symptom Score (IPSS), bother score, Uroflowmetry, post void residual volume (PVR), digital rectal exam, and quantification of prostate volume by transrectal ultrasound. The resected prostate (prostate chips) were weighed after resection and sent for histopathological analysis.

All patients underwent bipolar saline TURP under spinal anesthesia. A 22 - 24 Fr two-way silicone catheter was placed postoperatively, and continuous bladder irrigation was used. Patients were seen for medical visit postoperatively at 1 week, 1 month, 3 months and 6 months.

Sampling: To perform this study, we had a convenience sampling of one hundred and fifty-two (152) patients who suffered from benign prostatic hypertrophy (BPH) and went under surgery by Bipolar TURP. To be included, all patients with BPH had to have a medical file containing all the parameters of interest below.

Study Parameters: Different variables in this study are age, marital status, symptoms (LUTS), IPSS score and quality of life index (quality of life = QOL), medical history, weight of the prostate by intrarectal ultrasound (IRU), Uroflowmetry, Bladder scan, operation time, weight of resected chips, length of hospital stay, duration of bladder cathetering, histopathological analysis data and

postoperative complications.

Data processing and analysis: We used Excel 2016 software and IBM SPSS 21 (Statistical Package for social sciences) version 21.0 for processing and data analysis. Different statistical tests were averaging, standard deviation, Chi-square test, Pearson Correlation (r), Spearman Correlation and the T-Student.

Surgical procedure: Transurethral resection of the prostate was performed according to the standard NESBIT technique [12]. We used the Olympus brand Ch.27 resector, different bipolar electrodes, and saline was used for irrigation

3. Results

The average age of the patients was 66.5 ± 9.3 years (**Table 1**). They were married in the majority of cases (75.6%). The Catholic (42.8%) and Protestant (25.7%) religions were predominant, followed by revivalist churches (19.1%).

Arterial hypertension was the most observed comorbidity (29.7%), associated with diabetes mellitus in 18.4%. The most common surgical history was inguinal hernia in 21.7% of cases.

Clinically, obstructive symptoms were predominant (69.1%), mainly dysuria (46.1%) and acute urinary retention (23.03%) (**Figure 1**). There was a positive correlation between prostate volume and duration of symptoms ($r = 0.267$; $p = 0.001$) (**Figure 2**). In relation to prostate volume, there was no significant difference between obstructive and irritative symptoms ($p = 0.028$). On the other hand, a statistically significant difference was observed between the volume of the prostate and the duration of symptoms ($p = 0.001$) (**Figure 2**).

Among 152 patients, $n = 91$ (60%) had a prostate volume ≥ 80 ml; with an average of 104.8 ± 60.4 ml (**Figure 3**). The average value of PSA was 22.5 ng/ml (Ranges: 4 - 26.5). The minimum value was 1 ng/ml while the maximum value was >100 ng/ml (**Figure 4**). Most patients had a PSA level below 20 ng/ml for a prostate volume less than 200 ml.

The increase in urea and creatinin levels did not depend on prostate volume ($p = 0.169$ for urea, and $p = 0.125$ for creatinin). There was a negative correlation

Table 1. Distribution of patients according to sociodemographic data.

Variables	Number (n = 152)	%
Age (years) X \pm ET	66.5 ± 9.3	-
≤ 50	9	5.9
51 - 60	33	21.7
61 - 70	57	37.5
≥ 71	53	34.9
Marital status		
Married	115	75.6
Widower	20	13.2
Divorced	17	11.2

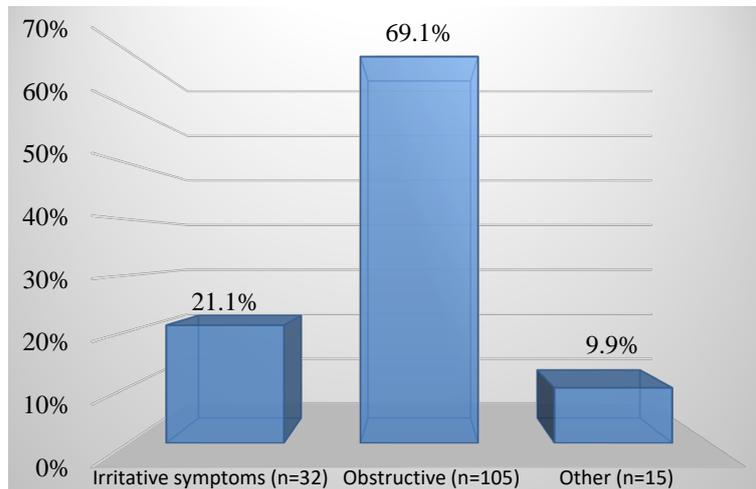


Figure 1. Distribution of symptoms related to their characteristics.

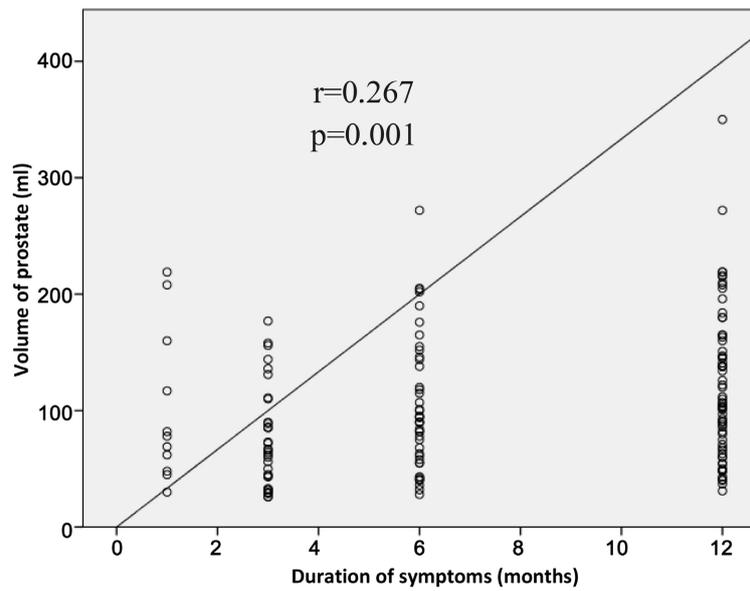


Figure 2. Prostate volume related to the duration of symptoms.

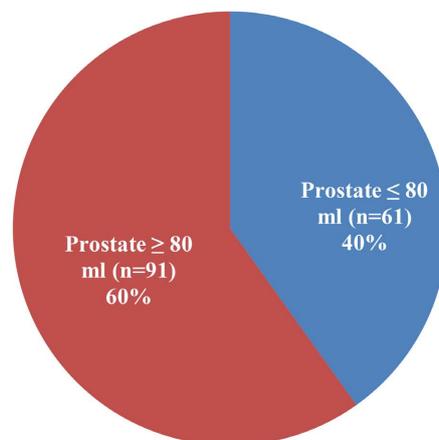


Figure 3. Number of the patients related to the prostate volume.

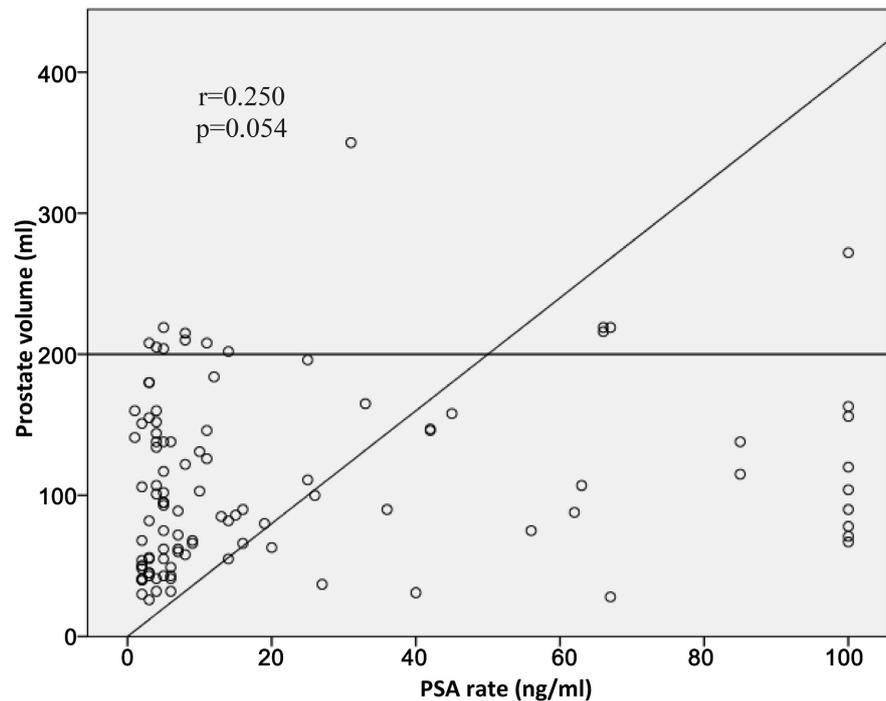


Figure 4. Correlation between prostate volume and PSA rate.

between the PSA level and the volume of the prostate by intrarectal ultrasound (IRU) ($r = 0.250$; $p = 0.054$) (**Figure 4**). The volume of the prostate was correlated with the age of the patients ($r = 0.321$; $p = 0.000$) (**Figure 5**).

Urine culture was pathological with a predominance of *Escherichia coli* and *Klebsiella pneumoniae*; 37.5% and 24.3% respectively. 15.8% of urine culture was sterile. Urine culture positivity was not significantly related to prostate volume ($p = 0.197$) (**Table 2**). The post-void residual (PVR) was significant in the group of patients with prostate volume ≥ 80 ml ($p = 0.008$). Comparison of the proportions with other paraclinical parameters related to prostate volume did not prove statistically significant differences ($p > 0.05$) (**Table 3**).

The average resection time of the prostate was 75 minutes; the maximum resection time was 110 minutes for a prostate of 350 ml. This resection time was correlated with the volume of the prostate ($r = 0.467$; $p < 0.001$) (**Figure 6**). The average volume of resected tissues (prostate chips) was 20 ± 65 grams which was not correlated with the volume of the remaining prostate due to the combination of resection and vaporization ($r = 1.000$; $p < 0.001$) (**Figure 7(a)** and **Figure 7(b)**).

Histopathological analysis concluded that FLMAH was present in 70% of cases; and associated with urothelial carcinoma of the bladder and carcinoma of the prostate in 4% and 2% respectively (**Table 4**). All the patients went under bipolar TURP which was performed alone in 73.7% and associated with castration in 7.9% for prostate adenocarcinoma. The average length of hospital stay was 2.4 days in 80% (Ranges 3 - 7).

The average catheterization duration was 3 days. The majority of patients

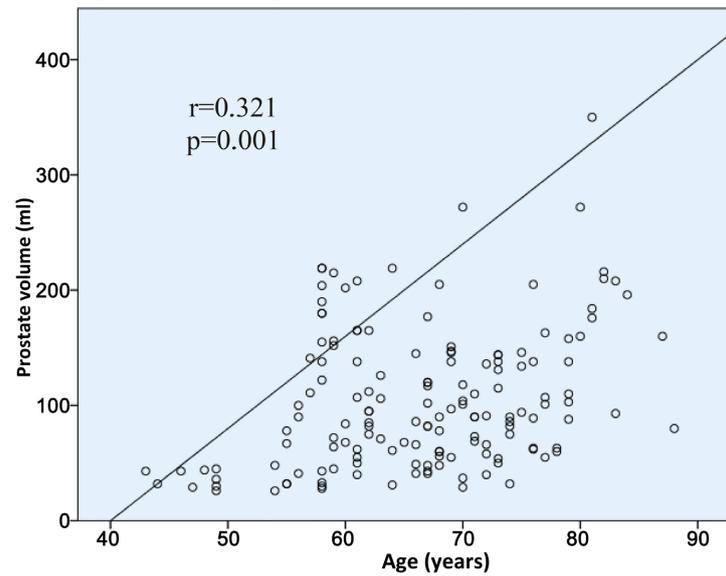


Figure 5. Prostate volume related to the patients' age.

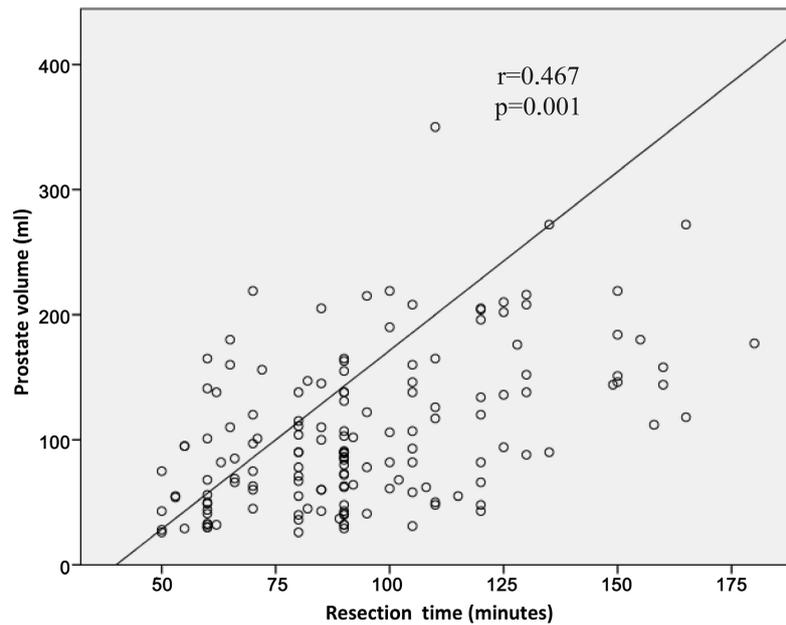


Figure 6. Prostate volume and resection time.

Table 2. Distribution of the patients related to results of urine culture.

Variables	Total (n = 152)	Prostate ≤ 79 cc (n = 61)	Prostate ≥ 80 cc (n = 91)	P
CBUE				0.197
<i>Escherichia coli</i>	57 (37.5)	20 (32.8)	37 (40.7)	
<i>K. pneumoniae</i>	37 (24.3)	18 (29.5)	19 (20.9)	
<i>Proteus mirabilis</i>	6 (3.9)	3 (4.9)	3 (3.3)	
<i>Streptococcus Hemolyticus</i>	6 (3.9)	3 (4.9)	3 (3.3)	
<i>Enterobacter cloacae</i>	5 (3.4)	4 (6.6)	1 (1.1)	

Continued

<i>Pseudomonas aeruginosa</i>	4 (2.6)	0	4 (4.4)
<i>Providencia rettgeri</i>	2 (1.3)	0	2 (2.2)
<i>Acinebacter specis</i>	2 (1.3)	1 (1.6)	1 (1.1)
<i>Candida tropicalis</i>	3 (1.3)	1 (1.6)	2 (1.1)
<i>Enterobacter Fecalis</i>	2 (1.3)	0	2 (2.2)
<i>Enterobacter serata</i>	3 (1.3)	0	3 (2.2)
<i>Candida albicans</i>	1 (0.7)	0	1 (1.1)
Sterile	24 (15.8)	10 (16.4)	14 (15.5)

Table 3. Distribution of paraclinical data in relation to prostate volume.

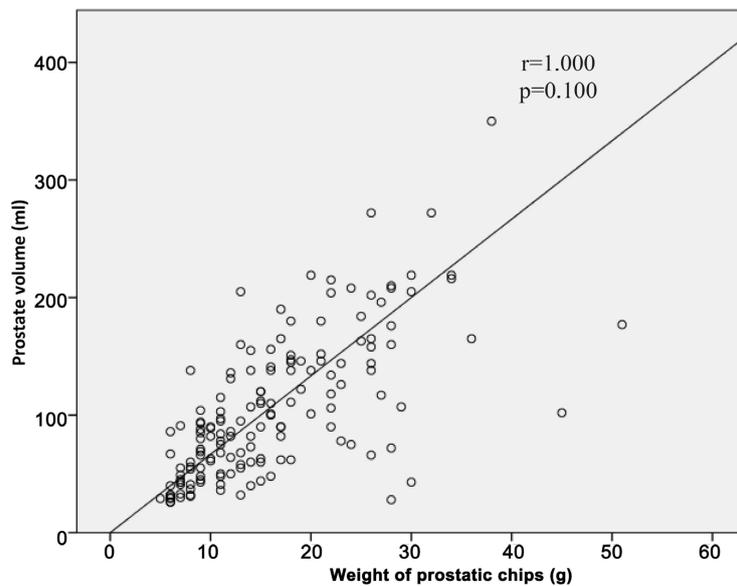
Variables	Total (n = 152)	Prostate ≤ 79 cc (n = 61)	Prostate ≥ 80 cc (n = 91)	P
Ultrasound	150 (98.7)	61 (100)	91 (100)	0.357
RVUC	10 (6.6)	8 (13.1)	2 (2.2)	0.010
Abdominal CT-Scan	10 (6.6)	4 (6.6)	6 (6.6)	0.578
Uroflowmetry				0.078
Dysuric curve	102 (67.1)	35 (57.4)	67 (73.6)	
Normal curve	36 (26.7)	17 (27.9)	19 (20.9)	
Non performed	14 (9.2)	9 (14.8)	5 (5.5)	
Bladder-Scan				0.008
Normal PVR	36 (23.7)	19 (31.1)	17 (18.7)	
Pathologic PVR	103 (67.8)	33 (54)	70 (76.9)	
Non performed	13 (8.6)	9 (14.8)	4 (4.4)	
Cystoscopy				0.218
Bladder cancer	5 (3.3)	3 (4.9)	2 (2.2)	
Bladder cancer + stone	1 (0.7)	0	1 (1.1)	
Polyps	3 (1.9)	0	3 (3.3)	
Bladder neck sclerosis	5 (3.3)	4 (6.6)	1 (1.1)	
Urethral stone	2 (1.3)	2 (3.3)	0	
Wrestling bladder	76 (50)	24 (39.3)	52 (57.1)	
Normal bladder	60 (39.5)	28 (45.9)	32 (35.2)	
Urea				0.169
Normal	112 (73.7)	48 (78.7)	64 (70.3)	
Pathologic	40 (26.3)	13 (21.3)	27 (29.7)	
Creatinin				0.125
Normal	116 (76.3)	50 (82)	66 (72.5)	
Pathologic	36 (23.7)	11 (18)	25 (27.5)	
Serum electrolytes				0.079
Normal	134 (88.1)	57 (93.4)	77 (84.6)	
Pathologic	18 (11.8)	4 (6.6)	14 (15.4)	
Hemoglobin				0.508
Anemia	19 (12.5)	7 (11.5)	13 (14.3)	
Normal	132 (86.8)	54 (88.5)	78 (85.7)	

Table 4. Distribution of patients related to histopathological diagnosis.

Variables	Total (n = 116)	Prostate ≤ 79 cc (n = 33)	Prostate ≥ 80 cc (n = 58)	P
Pathological diagnosis				0.686
BPH	81 (70)	23 (20)	58 (50)	
Prostate cancer Gleason 7	10 (6.6)	4 (6.6)	6 (6.6)	
Prostate cancer Gleason 8	5 (3.3)	2 (3.3)	3 (3.3)	
Bladder cancer	4 (2.6)	2 (3.3)	2 (2.2)	
BPH + Bladder cancer	3 (1.9)	2 (3.3)	1 (1.1)	
BPH + chronic prostatitis	7 (4.6)	2 (3.3)	5 (5.5)	
Prostate cancer Gleason 6	1 (0.7)	1 (1.6)	0	
Prostate cancer Gleason 9	3 (1.9)	1 (1.6)	2 (2.2)	
BPH + Prostate cancer Gleason	2 (1.3)	1 (1.6)	1 (1.1)	
Non performed	36 (23.7)	1 (1.6)	1 (1.1)	



(a)



(b)

Figure 7. (a) Prostatic chips after bipolar TURP. Source: Pointe-à-Pitre Clinic, Matete/Kinshasa, 2020; (b) Prostate volume and shaving volume.

(75%) did not have postoperative complications. Urinary incontinence was the main complication (7.2%); 13.8% of the complications were minor (Grade 1 and 2); while 2% of patients (Grade 3, 4 and 5) had major complications according to Clavien Dindo classification.

Blood transfusion was influenced by preoperative hemoglobin rate. 7% of patients with hemoglobin < 7 g/dl and 4% of patients with hemoglobin > 7 g/dl have been transfused, respectively for preoperative anemia and per operative hemorrhage. Among 152 patients who went under bipolar TURP, one hundred and forty-eight (148) had a good postoperative issue (98.6%); while four(4) patients died, representing a mortality rate of 2.6%. The causes of death were pulmonary embolism (2 patients), sepsis with multiorgan failure (1 patient) and deglobulization (1 patient).

Preoperatively, the IPSS score of 106 patients (70%) was severe with both symptoms of quality of life (QOL) compared to only 6 (4%) postoperatively. Three months postoperatively, the IPSS was improved in 112 patients (74%) (Table 6). The improvement in quality of life depended on the severity of symptoms; it was faster for mild and moderate symptoms and slow for severe symptoms (Table 7).

The average age of the patients was 66.5 ± 9.3 years. They were married in the majority of cases (75.6%). The Catholic (42.8%) and Protestant (25.7%) religions were predominant, followed by revivalist churches (19.1%).

Urine culture was pathological by the predominance of *Escherichia Coli* and *Klebsiella pneumoniae* in 37.5% and 24.3% respectively. These germs are frequently isolated in the urine of patients with lower obstructive uropathy.

The post void residue (PVR) was significant in the group of patients with prostate volume ≥ 80 cc ($p = 0.008$). Cystoscopy diagnosed 55% of various pathologies such as bladder cancer, urethral stenosis, sclerosis of the bladder neck and urinary tract stones.

Histopathological analysis found fibro adenomatous hyperplasia in 70%, BPH was associated with bladder cancer and prostate cancer in 4% and 2% respectively ($p = 0.686$).

Most of our patients (75%) did not have post-operative complications. Urinary incontinence was the most encountered complication (7.2%). Most of the encountered complications were minor (Grade 1 and 2) in 13.8%; while 2% of patients (Grade 3, 4 and 5) had major complications according to the Clavien Dindo classification (Table 5).

Table 6 and Table 7 show that 70% of patients had severe symptoms that were improved three months after the Bipolar TURP (74%). The improvement in quality of life depended on the severity of the symptoms; it was faster for mild and moderate symptoms and slow for severe symptoms.

4. Discussion

Benign prostatic hypertrophy affects 50% of men aged over 50 years. Its prevalence increases gradually with age; 90% of men over 80 years old are affected.

Table 5. Classification of surgical complications according to Clavien Dindo.

Complications	Number	Clavien Dindo				
		1	2	3	4	5
Hemorrhage	10 (6.6%)	7 (4.6%)	0	3 (2%)	0	0
Urinary incontinence	11 (7.2%)	11 (7.2%)	0	0	0	0
Erectile dysfunction	6 (4%)	0	0	0	0	0
Perforation	4 (2.6%)	0	0	2	0	0
AUR	4 (2.6%)	0	0	0	0	0
Urinary infection	3 (2%)	0	3 (2%)	0	0	0
None	114 (75%)	0	0	0	0	0
TOTAL	152 (100%)	18 (11.8%)	3 (2%)	3 (2%)	0	0

Table 6. IPSS score of the patients.

IPSS score	0 - 7 n (%)	8 - 19 n (%)	20 - 35 n (%)
Preoperative	17 (11)	29 (19)	106 (70)
Postoperative	112 (74)	34 (22)	6 (4)

Table 7. IPSS score/Quality of life of patients 3 months postoperatively.

IPSS S./QOL	0	1	2	3	4	5	6	TOTAL
0 - 7	46 (30%)	75 (49%)	16 (11)	7 (5)	4 (3)	2 (1)	2 (1)	152 (100%)
8 - 19	39 (26%)	71 (47%)	11 (7%)	5 (3%)	7 (5%)	11 (7%)	8 (5%)	152 (100%)
20 - 35	32 (21%)	66 (43%)	13 (9%)	9 (6%)	13 (9%)	14 (9%)	5 (3%)	152 (100%)

The average age of the patients was 66.5 ± 9.3 years (**Table 1**). Most of studies reveal an average age over the 6th decade respectively: 65.7 years, 69 ± 8 , 70.13 years, 70 ± 6 and 71.2 ± 4.5 [13] [14] [15] [16]. Considering these results, we agree that BPH is pathology of the elderly with a high frequency relatively after 60 years. Dysuria and acute urinary retention were the main symptoms, respectively in 46.1% and 23.03% (**Figure 1**). These results confirm those of some studies [15] [16] But different from some authors who report pollakiuria as being the main symptom in 90% of cases [17].

Hypertension was the most common medical history (29.7%); or associated with diabetes mellitus (18.4%) (**Figure 1**). Hypertension and diabetes as comorbidities of BPH are described in different studies [13] [18] [19] [20] [21]. Inguinal hernia was associated with BPH in 21.7% of cases (**Figure 1** and **Figure 2**). The occurrence of inguinal hernia is very common [15] [16]. These hernias are due to abdominal hyperpressure following obstructive LUTS. Urine culture was pathological by the predominance of Escherichia Coli and Klebsiella pneumoniae in 37.5% and 24.3% respectively (**Table 2**). These germs are frequently isolated in the urine of patients with lower obstructive uropathy [18] [22].

This predominance of colonization by *E. coli* is due to the virulence of the germ and its properties to attach and migrate along the urinary tract because of its pili [23].

Histopathological analysis found fibro-leiomyo-adenomatous hyperplasia (FLMAH) in 70% of cases; it was associated with urothelial carcinoma of the bladder and carcinoma of the prostate in 4% and 2% respectively (Table 4). Many studies do not mention the results of prostatic chips analysis after TURP [1] [9] [13] [24]. We found one study that reported a high number of prostate carcinoma [18]. Most of the patients (86.3%) had a dysuric curve on preoperative uroflowmetry, but only 4% of patients had a dysuric curve postoperatively ($p < 0.05$). Preoperatively, Qmax was < 15 ml/s including the significant post-void residual (PVR) in the group of patients with prostate volume ≥ 80 ml ($p = 0.008$), this Qmax has been improved significantly after TURP (Table 3). Our results are like those of other authors [13] [24] [25] [26].

60% (Sixty percent) of patients had a prostate weight more than 80 ml. The largest resected prostate in our series was 350 ml. Some authors have successfully resected large prostates [9] [15]. Other authors prefer laparoscopic surgery for large prostate glands [27] [28] (volume of 75 to 190 and 500 ml), others practice embolization followed by TURP [29], (volume of 463 ml), ($r = 0.321$; $p < 0.001$) [19]. Our results are similar to those of other authors [9] who did not report a significant difference which could be explained by ethnic and genomic considerations. The bivariate analysis did not find a correlation between the volume of the prostate and the volume of the resected tissue (prostate chips). The average volume of the resected tissue in our series is 20 ± 68 g (Ranges: 12 - 45) ($r = 1.000$; $p = 1.00$) (Figure 7(a) and Figure 7(b)). Our results are similar to those of some authors [30] who found that there is no correlation between the ultrasound weight of BPH and prostate chips ($r = 0.214$, $p < 0.05$). However, some authors suggest having resected 70% of the adenomatous prostate [13] [31]. Most of patients had a PSA level below 20 ng/ml for a prostate volume less than 200 ml. The correlation was not statistically significant ($r = 0.250$; $p = 0.054$). The mean value of PSA level was 22.5 ng/ml (Ranges: 4 - 26.5). The minimum value was 1 ng/ml while the maximum value was > 100 ng/ml (Figure 4). Our results differ from those of other studies [32]. These authors worked on BPH of standard volume (30 - 80 ml) [1] [13] [31]. Some authors who have resected large BPH report an average PSA level of 4.66 ng/ml [9] [25], unlike other authors who report an average level of 62.19 ng/ml because of the high proportion of prostate carcinoma in their series [18]. Most of prostate glands were resected within seventy-five (75) minutes. The resection time was almost proportionally correlated with the volume of the prostate ($r = 0.467$; $p < 0.001$). However, the largest prostate (350 ml) was resected in 110 minutes (Figure 6). Apart from a single study which reports an average resection time of 182.3 ± 54.3 minutes for an average prostate volume of 31.2 ± 9.76 ml [34], others mention a resection time less than 70 minutes) [25]. Because of the absence of TURP syndrome in Bipolar TURP, the resection time for large prostates can be extended beyond 60

minutes. This resection time depends on the volume of the prostate, the learning curve of the surgeon, the expertise of the operator as well as the available materials.

The average length of hospital stay of patients was 2.4 days (80%) (Ranges: 3 - 7) in 6%. This postoperative hospital stay confirms the results obtained by other authors [13] [34]. In Africa, two studies, respectively in Senegal and in Egypt (large BPH) found 2.8 days of hospital stay (Ranges: 3 - 12) [26]. The postoperative delay of the hospital stay is closely related to complications. The majority of our patients (75%) did not have postoperative complications (Table 5). Their quality of life was significantly improved (IPSS and Qmax) (Table 6 and Table 7). These results are similar to those in the literature [9] [25].

Urinary incontinence and hemorrhage were the most frequent complications; 7.2% and 6.6% respectively. 7 patients (4.6%) were transfused. Most of the complications were Grade 1 (11.8%). 2% of patients had major complications according to the Clavien Dindo classification (Table 5). Some authors report similar complications including the transfusion rate (1% - 3%) [35] [36] [37] [38]. In our series, transfusion rate was more observed at the beginning of learning the procedure of resection. The mortality rate in this series was 2.6% (4 patients). These results differ from those of other authors who report mortality rates of 0.6% and 1% respectively [35] [39].

70% of patients had the IPSS with severe symptoms and bother QOL preoperatively; 74% of the patients improved their IPSS and QOL three months postoperatively (Table 6). The improvement in quality of life depended on the severity of the symptoms; faster for mild and moderate symptoms, and slower for severe symptoms (Table 7). Many authors who have evaluated the severity of symptoms and the quality of life of patients before and after bipolar TURP report similar results [9] [21] [34] [40] [41] [42].

5. Conclusion

Although open adenectomy is a standard surgical treatment of large BPH in conventional surgery, the progress of minimally invasive surgery mainly Bipolar TURP confers many advantages such as; the low rate of complications, reduced length of hospital stay and improvement in the patient's quality of life. The results of the current study on the resection of large adenomas, as well as those of other authors encourage practitioners to extend the indication of Bipolar TURP to large BPH (>80 ml).

Limitations of This Study

The current study could not be extended to general population of Kinshasa because of its small sample size and a short study period, but furthermore, it provided us with satisfactory and useful data for our daily practice.

Strength of the Study

This study analyzed the issue of patients under TURP procedure without ran-

domized clinical trials. It was a quick and less expensive, helping us to assess the quality of life (QOL) of our patients. The final results were comparable with those of other authors.

Contribution of the Authors

Dr Mazoba Tacite contributed to the processing and statistical analysis of the data.

Other authors participated in the selection of patients, surgical procedure and correction of the article.

Conflicts of Interest

The authors declare that they have no conflict of interest in relation to this article.

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