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Palliative Endoscopic Resection of the Prostate for Advanced or Metastatic Prostate Cancer: Results and Outcomes in A Resource-Limited Setting

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ABSTRACT

Background: *Prostate cancer, a disease common among elderly men, is often diagnosed at an advanced stage in resource-limited settings, when patients have developed bladder outlet obstruction (BOO). These patients commonly experience dysuria, urinary retention, high residual volume, and bladder stones, which seriously affect their daily lives. Palliative transurethral resection of the prostate (PTURP) is a surgical treatment option for advanced or metastatic prostate cancer. This study evaluates the results and the outcomes of patients with BOO due to advanced, metastatic prostate cancer who underwent PTURP at a single center in Douala.*

Methods: *This is a retrospective and descriptive study about 130 patients who underwent a palliative transurethral resection of the prostate from 2020 to 2025. The data were retrieved from patients' clinical records. All patients had biopsy-confirmed prostate cancer and underwent PTURP at a single center, where all procedures were performed by the same urologist. Data were entered into Microsoft Excel 2019 and exported to R version 4.5.1 for statistical analysis.*

Results: *The participants' median age was 64[57.2–70] years, with 36.92% of patients aged 62–71 years old. The most common clinical presentation was obstructive symptoms (44.62%). Approximately 86.92% of participants had at least one kind of metastasis, and 70% of them had high-grade cancer (Gleason score of 8–10). The surgery duration ranged from 15 minutes to 150 minutes, with a median value of 77.5[60–90] minutes. The duration of hospitalization was 2 days in 116(89.23%) participants and 3 days in 14(10.77%) participants. Postoperative complications occurred in 9 (6.92%) patients, and these were macroscopic hematuria, orchi-epidydimitis, and suprapubic urinary catheter placement in three patients each. The median changes (preoperative – postoperative) in quality of life (QoL), international prostate symptom score (IPSS), maximum urinary flow rate (Qmax), and post-void residual volume were -3.5, -13.5, +12.5 ml/s, and -4.5 ml, respectively (all P<0.001).*

Conclusion: *PTURP is a safe, effective, and efficient minimally invasive procedure that significantly improves the quality of life of patients with advanced-stage, metastatic prostate cancer. It should routinely be considered for patients with bladder outlet obstruction.*

Keywords

Metastatic prostate cancer, Bladder outlet obstruction, Palliative care.

Introduction

Prostate cancer is the second most common cancer in men worldwide [1]. Although its incidence has been on the rise worldwide, low-income countries bear the highest mortality-to-incidence ratios, reflecting diagnosis at more advanced stages and suboptimal treatment [2]. IN Cameroon, prostate cancer is now the leading malignancy among males, especially in urban centers like Douala and Yaoundé, where hospital-based series report a high throughput of prostate cancer cases [3,4]. Despite this need for healthcare intervention, national cancer registries

remain underdeveloped, so the true population-level burden is underestimated, and clinical practice is often driven by late-presenting, symptomatic prostate cancer [4]. The late diagnosis of most cases in the nation is associated with not only symptomatic disease but also a poor prognosis, as a 2025 study reports advanced-stage diagnosis in 80% of cases and a mortality rate north of 50% [5]. This pattern of late presentation is driven by a confluent of patient-, health-system- and cultural-level factors [4,6]. Therefore, as it stands, palliative care is the mainstay of prostate cancer treatment in the country, because once diagnosed at an advanced stage, and many Cameroonian patients experience rapid disease progression and shortened survival. In addition to the high mortality rates, these patients frequently experience profound urinary and systemic symptoms, including acute urinary retention, weak stream, incomplete bladder emptying, hematuria, pelvic pain, and constitutional effects such as asthenia and cachexia [7]. These symptoms impose a heavy burden on quality of life (QoL), disrupting daily activities, sleep, and social roles, especially in settings where palliative services and psychosocial support are rudimentary. In men with advanced or metastatic prostate cancer, guideline-based systemic therapy such as androgen-deprivation therapy (ADT) remains the cornerstone of treatment, but relief of bladder outlet obstruction (BOO) can be delayed by several weeks to months [8]. Palliative resection of the prostate—including transurethral resection of the prostate (TURP) and other minimally invasive endoscopic techniques—has been shown to significantly reduce postvoid residual urine volume, improve the International Prostate Symptom Score (IPSS), and mitigate urinary retention in patients with metastatic disease [9]. Although there are claims that radical prostatectomy can also be indicated in such patients [10], minimally invasive endoscopic techniques are preferable in low-resource settings because they can be performed with relatively basic equipment, with significantly shorter hospitalization periods and acceptable postoperative morbidity, thereby improving patients' voiding-related QoL [11], even when the overall prognosis remains poor. Palliative transurethral resection of the prostate (PTURP) for advanced or metastatic prostate cancer is increasingly recognized as a valuable strategy to improve urinary-related QoL in men whose oncologic prognosis is already poor [12], mostly due to late diagnosis, especially in low-resource settings where systemic and radiotherapeutic options are either unavailable or unaffordable for the patient. However, since minimally invasive surgical techniques are still relatively uncommon in the practice of urology in Cameroon [13], the outcomes of patients who underwent palliative procedures for prostate cancer have not yet been assessed to the best of our knowledge. Therefore, this study evaluates the results and the outcomes of patients with advanced or metastatic prostate cancer and BOO who underwent PTURP at a single healthcare facility in Douala.

Materials and Methods

This was a retrospective study carried out at Saint Cyr Endoscopy Urology Center *in Douala*. We consulted the clinical records of patients with advanced or metastatic prostate cancer with BOO who underwent PTURP. We included all patients who underwent the procedure at our center from January 2020 to December 2025 and excluded those with incomplete clinical records. A total of 130 patients were ultimately included in this study. The data we obtained from the participants' clinical records included patients' age, clinical presentation, duration of indwelling catheter before surgery, preoperative prostate-specific antigen titer (PSAT), preoperative Gleason score, preoperative International Society of Urological Pathology (ISUP) score, prostate volume as per the transrectal ultrasound (TRUS), total PSAT, preoperative and postoperative hemoglobin levels, transfusion during or after surgery, prostate biopsy results, Gleason score upon pathological analysis of prostate biopsy specimens, the International Society of Urological Pathology (ISUP) score, preoperative serum creatinine level, preoperative hydronephrosis (unilateral, bilateral, or absent), presence of metastasis (bone, ganglionic, or visceral), preoperative and postoperative International Prostate symptom Score (IPSS), preoperative and postoperative QoL scores, preoperative and postoperative maximum urinary flow rates (Qmax), preoperative and postoperative intravesical urinary residue, prostate volume as determined by ultrasound, surgery duration, volume of hydronephrosis, laterality of hydronephrosis, management of hydronephrosis (Double-J stent or nephrostomy), duration of hospitalization (in days), day of removal of indwelling urinary catheter, and presence and type of postoperative complications. The IPSS score was assessed using a standardized questionnaire (IPSS questionnaire) that contains seven questions on the obstructive and irritative symptoms of prostatism, with each question scored from 0 to 5, with 0 indicating the complete absence of the symptom and 5 indicating the constant presence of the symptom. This questionnaire also contains a question on the patient's QoL, which is scored from 0 to 6, with 0 indicating the best possible QoL and 6 indicating the worst possible QoL. With this questionnaire, the total score ranges from 0 to 35, with 0–7 being mildly symptomatic, 8–19 moderately symptomatic, and 20–35 being severely symptomatic [14]. Surgery is usually indicated for severely symptomatic patients. Uroflowmetry was also performed in all patients before and after surgery to evaluate the Qmax, except for those whose prostate glands were voluminous enough to cause acute urinary retention (for which they had indwelling Foley's catheters), which prohibited the assessment of Qmax. A Qmax of >15 ml/s is considered normal while a Qmax of <10 ml/s is considered abnormal [15].

In this study, patients were included consecutively. All study participants had prostate cancer confirmed via biopsy with histopathology. Also, extension workups, mainly computed tomography, had been performed to determine the presence and sites of metastasis. All patients were to undergo PTURP for symptomatic relief and QoL improvement. Before surgery, all the patients consulted an anesthetist and did certain preoperative laboratory tests, including a complete blood count, blood urea, serum creatinine, prothrombin time, kaolin-cephalin coagulation time, and urinalysis. This was to ensure that the patients had satisfactory blood cell counts, hemoglobin levels, kidney function indexes, and sterile urine before the surgery since a urinary tract infection of any kind is a contraindication to this mini-invasive procedure. All patients undergoing PTURP were given

appointments 15 days after the procedure to assess their IPSS, QoL, Qmax, urinary residue, and postoperative complications.

PTURP was performed with the help of the bipolar Olympus Generator under spinal or general anesthesia using a continuous-flow resectoscope and bipolar energy, with the patient in the lithotomy position and irrigation pressure kept low to minimize fluid absorption. Resection is deliberately superficial, creating a wide channel through the median and lateral lobes without deep dissection to the true capsule, thereby reducing bleeding and capsular perforation risk in infiltrative, vascular tumors like prostate cancer. With this technique, metastasis is meticulous, and a three-way Foley catheter with continuous bladder irrigation is left in place for 24–72 hours or until the urine clears. During this procedure, deep resection near the verumontanum and ejaculatory ducts was avoided, saline irrigation was employed, and bipolar energy was used. All the interventions were carried out by the same urologist. The main outcome variables were the postoperative Qmax, IPSS, QoL, intravesical urinary residue, and postoperative complications.

The data collected from the patients' clinical records were entered into Microsoft Excel 2016 and then exported to R version 4.5.1 for statistical analysis. This study was approved by the institutional review board of the Faculty of Medicine and Pharmaceutical Sciences (FMPS) of the University of Douala and by the ethical committee of Saint Cyr Endoscopy Urology Center in Douala, Cameroon. The requirement for patients' informed consent was waived due to the retrospective nature of the study. Continuous variables were presented as mean values and standard deviations for normally distributed data and as median values with interquartile ranges for data with skewed distributions. The independent samples t-test was used to compare between normally distributed continuous variables while the Mann-Whitney U test was used to compare continuous variables with skewed data distributions. The chi-square test and the Fisher exact test were used to compare categorical variables. $P < 0.05$ was considered statistically significant.

Results

The ages of the 130 study participants ranged from 44 years to 85 years, with a median value of 64[57.2–70] years. The most represented age group was the 62–71 years age group, which accounted for 36.92% of participants. The clinical presentations were obstructive symptoms only, coexisting obstructive and irritative symptoms, obstructive symptoms and bladder sones, acute urinary retention, UTI, and irritative symptoms only in 58, 24, 10, 20, 10, and 8 patients, respectively. The ISUP scores were 2, 3, 4, and 5 in 14, 27, 60, and 29 patients, respectively. The preoperative Qmax ranged from 4 ml/s to 14 ml/s, with a median value of 10[7.2–12.8] ml/s. Before surgery, 20 (15.38%) patients had indwelling urinary catheters for BOO. The preoperative IPSS scores ranged from 14 to 35, with a median value of 24[19–29]. The preoperative urinary residue ranged from 37 ml to 250 ml, with a median value of 86[71.2–99.8] ml. In total, 113 (86.92%) participants had at least one kind of metastasis, with 101 (77.69%) having ganglionic metastasis, 6 (4.62%) having visceral metastasis, and 51 (39.23%) having bone metastasis. The preoperative QoL ranged from 3 to 6, with a median value of 5[4–5]. The clinical characteristics of the study participants are summarized in Table 1.

Table 1: Clinical characteristics of the study participants.

Variable	Frequency	Percentage (%)
Age (years)		
44–51	15	11.54
52–61	39	30
62–71	48	36.92
72–81	27	20.77
>81	1	0.77
Clinical presentation		
Obstructive symptoms only	58	44.6
Obstructive and irritative symptoms	24	18.5
Obstructive symptoms and bladder stones	10	7.7
Acute urinary retention	20	15.4
Urinary tract infection	10	7.7
Irritative symptoms only	8	6.2
Metastasis (present)	113	94.17
Site of metastasis		
Ganglions	101	77.69
Bones	51	39.23
Viscera	6	4.62
Preoperative ISUP score		
2	14	10.8
3	27	20.8
4	60	46.2
5	29	22.3
Preoperative Qmax (ml/s)		
0–5	12	9.23
6–10	61	46.92
11–14	37	28.46
NA	20	15.38
Preoperative IPSS score		
0–20	47	36.15
21–30	64	49.23
>30	19	14.62
Preoperative post-void residual volume (ml)		
0–50	7	5.39
51–100	78	60
>100	25	19.23
NA	20	15.38
Preoperative QoL		
3	18	13.85
4	44	33.85
5	45	34.61
6	23	17.69

IPSS: International prostate symptom score
ISUP: International society of urological pathology
Qmax: maximum urinary flow rate
QoL: Quality of life

The Gleason scores were 7, 8, 9, and 10 in 39, 58, 27, and 6 patients, respectively, indicating that 91 (70%) participants had high-grade prostate cancer (Gleason score of 8–10). The prostate

volume ranged from 30 ml to 150 ml, with a median value of 70.5[59–85] ml. The PSAT ranged from 34.5 ng/ml to 8832 ng/ml, with a median value of 250.6[131.8–531] ng/ml. Hydronephrosis was absent in 91 patients, present but unilateral in 26 patients, and bilateral in 13 patients. The fluid volume of the hydronephrosis ranged from 15 ml to 45 ml, with a median value of 24[21–30] ml. Hydronephrosis was managed using a double-J stent 28 (71.79%) of the 39 patients who had it and via nephrotomy in the remaining 11 (28.21%). The surgery duration ranged from 15 minutes to 150 minutes, with a median value of 77.5[60–90] minutes. The duration of hospitalization was 2 days in 116(89.23%) participants and 3 days in 14(10.77%) participants. The indwelling urinary catheters placed during surgery were removed on postoperative day 5 in all patients. Postoperative complications occurred in 9 (6.92%) of the study participants, and these complications were macroscopic hematuria, orchi-epidydimitis, and suprapubic urinary catheter placement in three patients each. The paraclinical and operative details of the patients are presented in Table 2.

Table 2: Paraclinical and operative details of the study participants.

Variable	Frequency	Percentage (%)
Gleason score		
7	39	30
8	58	44.62
9	27	20.77
10	6	4.61
Prostate volume (ml)		
0–30	1	0.77
31–60	41	31.54
60–90	62	47.69
91–120	23	17.69
>120	3	2.31
Hydronephrosis		
Absent	91	70
Unilateral	26	20
Bilateral	13	10
Fluid volume (ml)		
15–25	72	55.38
25–30	43	33.08
31–40	12	9.23
>40	3	2.31
Management of hydroneprhosis		
Double-J stent	28	71.79
Nephrotomy	11	28.21
Surgery duration (min)		
0–30	2	1.54
31–60	37	28.46
61–90	59	45.38
>90	32	24.62
Duration of hospitalization (days)		
2	116	89.23
3	14	10.77
Postoperative complications		
Present	9	6.92
Absent	121	93.08

The postoperative IPSS score ranged from 5 to 27, with a median value of 10[7.2–12.8]. The postoperative Qmax ranged from 8 to 32, with a median value of 21.5[18–25]. The postoperative QoL score ranged from 0 to 4, with a median value of 1[0.2–2]. The postoperative urinary residue ranged from 17 ml to 400 ml, with a median value of 40.5[31–52]. The median changes (preoperative – postoperative) in QoL, IPSS, Qmax, and urinary residue were -3.5, -13.5, +12.5, and -4.5, respectively, and all these changes were statistically significant (all $P < 0.001$). The postoperative parameters and their comparisons are presented in Table 3.

Table 3: Postoperative parameters and their comparisons**.**

Variable	Frequency	Percentage (%)
IPSS score		
0–10	61	46.92
11–20	61	46.92
>20	8	6.16
Qmax (ml/s)		
<10	2	1.54
10–20	41	31.54
21–30	76	58.46
>30	11	8.46
QoL		
0–1	33	25.38
>1–2	56	43.08
>2–3	27	20.77
>3	14	10.77
Post-void residual volume (ml)		
<30	26	20
30–50	67	51.54
>50	37	28.46
Comparisons between preoperative and postoperative outcome measures		
Parameter	*Median change*	*P-value*
IPSS	-13.5	<0.001
Qmax	+12.5	<0.001
QoL	-3.5	<0.001
Post-void residual volume	-4.5	<0.001

Discussion

This study evaluated the results and the outcomes of patients with BOO due to advanced, metastatic prostate cancer who underwent PTURP at a single center in Douala. We found that PTURP significantly improved the IPSS score, QoL, Qmax, and post-void residual volume in these patients. The median age of our patients was 64 years, which is less than the 74.2 years reported by Crain et al. in the United States [16]. This difference can be explained by the difference in study setting, as Crain et al. conducted their study in a nation where medical science is advanced and such pathologies are commonly diagnosed at an earlier stage, as shown in their lower proportion of patients with high-grade cancer (22.7% vs. 70% in this study). This indicates that routine prostate cancer screening and early management will reduce the need for such palliative procedures in the Cameroonian context. However, given the resource constraints that are plaguing the nation's health system, such widespread screening might still be farfetched, which makes PTURP relevant in Cameroon's contemporary healthcare landscape. The median surgery duration was 77.5

minutes, which falls within the range reported for contemporary bipolar transurethral prostate resection (B-TURP) series, such as a comparative study in which the mean durations for B-TURP and bipolar enucleation were 83.8 and 73.4 minutes, respectively [17], indicating that our PTURP procedures are comparable in ease of execution to established endoscopic prostate resection techniques. This relatively short duration, despite advanced disease and potential technical constraints in our setting, further supports the feasibility of minimally invasive surgery for the alleviation of BOO associated with advanced prostate cancer. The vast majority (89.23%) of our participants were hospitalized for just two days, which is consistent with modern, minimally invasive urological practice, in which the duration of postoperative hospitalization ranges from 1–3 days [18]. This short admission period suggests that PTURP can be delivered as a relatively efficient inpatient intervention, even in people with advanced or metastatic prostate cancer and significant comorbidities. A brief two-day hospital stay likely allows adequate monitoring for early complications such as hematuria, clot retention, or urinary re-obstruction, while minimizing the risk of hospital-acquired morbidity and preserving outpatient quality of life in this sensitive population. The short hospitalization period also enables these patients, who are often aware of the poor prognosis of their condition, to leave the hospital as soon as possible, which is important for their mental health, as the cyclical relationship between depression and more frequent/prolonged hospitalization in men with prostate cancer was demonstrated in 2019 [19].

Furthermore, in the Cameroonian setting, where bed space limitations and other hospital resource constraints are not uncommon, such procedure that enable patients to be moved on rapidly are always welcome. The rate of postoperative complications in our study was 6.9%, which is lower than the 9.0% reported in a 2019 nationwide-database analysis conducted in the USA [20]. This difference might be explained by the difference in sample size, as we included 130 patients in our study as compared to the 31,813 patients included in the other study. The low complication rate highlights the safety of this surgical technique and its appropriateness in this population of relatively frail patients. Such low complication rates will encourage more patients with the condition to consider the procedure, especially as surgical procedures, including minimally invasive ones, often inspire fear in patients and their families [21]. The postoperative complications identified in this study were macroscopic hematuria, orchi-epididymitis, and the placement of a suprapubic urinary catheter. Hematuria, the most common early postoperative event after TURP, often reflects raw prostatic fossa bleeding. It is usually self-limiting or managed via bladder irrigation or temporary catheter retention. Orchi-epidydimitis is often a result of urinary contamination or postoperative infection, which are common with palliative procedures in patients of this category. The failure of adequate urethral voiding postoperatively resulted in the need for suprapubic catheter placement in three patients. This may have resulted from persistent obstruction, bladder decompensation, clot retention, or urethral/catheter-related issues. The predominance of minor, manageable complications in our series mirrors the pattern observed in other series where most early events are low-grade and resolve with conservative or minimally invasive management, reinforcing the role of PTURP as a relatively low-risk intervention to relieve BOO in this delicate population [22,23]. In this study, there was a robust and clinically meaningful improvement in lower urinary tract symptoms (LUTS) and functional bladder performance post-PTURP, as the median QoL score, IPSS, Qmax, and post-void residual volume all improved significantly. The robust statistical significance (all $P < 0.001$) of the changes in these outcome variables indicates that the observed improvements were not due to random variation but to the therapeutic effect of PTURP. Similar effects of this procedure have been reported in previous studies. A systematic review and meta-analysis of 8 studies encompassing 3080 patients with advanced prostate cancer reported that PTURP significantly improved symptom scores by 14.13 points, similar to the 13.5 point improvement we found, and reduced post-void residual volume by 50.4 ml, which is much higher than the 4.5 ml reduction we noticed [24]. Another study also reported similar findings, with Qmax, IPSS, QoL, and the post-void residual volume improving by +10.15 ml/s, 16.7 points, +3.57, and 95.3 ml [25], which are similar to our findings, except for the post-void residual volume that is much larger in the previous study (+12.5 ml/s, 13.5 points, 3.5, and 4.5 ml, respectively). These robust findings indicate the incontestable efficacy of the procedure in improving LUTS and functional bladder performance in these patients.

In conclusion, the role of PTURP as a palliative measure to relieve BOO in men with advanced prostate cancer in the Cameroonian context is adequately supported by evidence. The safety and efficacy of this procedure have been proven, and its short hospitalization period is additional incentive to consider the procedure in patients with the condition.

Nevertheless, this study has some noteworthy limitations. First, the small sample size reduces the power of the study and hinders the generalizability of our findings. Second, it was conducted at a single urology center in Douala, which means the study population may not be very representative of the all patients with advanced, metastatic prostate cancer in Cameroon. Third, being a retrospective study, it was prone to recall bias. Fourth, the absence of long-term follow-up of study participants to ascertain the absence of late postoperative complications may have skewed the rate of postoperative complications. However, irrespective of these limitations, our study successfully identifies PTURP as a suitable mini-invasive surgical technique to relieve BOO in patients with advanced, metastatic prostate cancer in Cameroon. In the future, multicenter, prospective studies with larger study samples and longer postoperative follow-up periods should be conducted to adequately explore the long-term prognosis of patients who undergo this procedure.

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