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Epidemiologic Clinical and Therapeutic Profile of Advanced Bladder Cancer: A Ten-Year Retrospective Study in Yaounde and Douala General Hospitals

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Abstract

Background: Advanced bladder cancer (ABC) remains particularly frequent in our practice. Bones and lungs are the most common metastases of ABC. Advance Bladder cancer has higher mortality thereby emphasising the importance of its early diagnosis. **Aim:** To determine the prevalence, clinical features and treatment and outcome of patients with advanced bladder cancer in the oncology units of Yaounde and Douala General hospitals. **Method:** This study employed a retrospective descriptive design over a ten-year period (January 2013 - December 2022). Medical records of patients diagnosed with advanced bladder cancer were retrieved from the oncology units of Yaoundé and Douala General Hospitals. Data analysis was conducted using SPSS version 25.0. **Results**: A total of 10,684 medical records were reviewed, from which 66 cases of advanced bladder cancer were identified. Twelve (12) cases were excluded, resulting in a final sample of 54 participants. The majority of cases

(74.07%) were from Yaoundé General Hospital, while 25.92% were from Douala General Hospital. The mean age of participants was 56.78 ± 14.25 years, with an age range of 24 to 80 years. The male-to-female ratio was 1.3:1. Macroscopic hematuria was the most common clinical presentation. The lungs were the most frequently affected site of metastasis, observed in 20.4% of cases. Chemotherapy was the primary treatment modality, administered to 32 patients (59.3%), with 18 (33.33%) receiving the Carbogemzar protocol. The mean follow-up duration was 143.6 ± 312.09 days, and disease progression was noted in 11 patients (20.4%). **Conclusion:** Delayed diagnosis of bladder cancer is still common in Africa with a high mortality rate. More efforts should be made to ensure the early diagnosis of the condition and improve patient outcomes.

Keywords

Advanced Bladder Cancer, Prevalence, Clinical Features, Treatment, Outcome

1. Background

Advanced bladder cancer (ABC) is a malignancy characterized by uncontrolled proliferation of bladder cells by invasion of the detrusor muscles and/or neighboring organs [1] [2]. Bladder cancer (BC) is the 10th most common cancer worldwide [3]. Among men, it is the 6th most common cancer, and among women, the 17th most common cancer [4]. The incidence of bladder cancer in Africa is 7.0 per 100,000 populations in men and 1.8 per 100,000 in women. The incidence of bladder cancer is consistently higher in North Africa in both sexes. Among men, the estimated incidence of 10.1 per 100,000 in North Africa and 5.0 per 100,000 in Sub-Saharan Africa. In women, the incidence was 2.0 per 100,000 and 1.5 per 100,000 in North Africa and SSA, respectively. Incidence rates increased significantly among men from 5.6 in the 1990s to 8.5 per 100,000 in 2010 [5]. In Cameroon, it is the second among genito-urinary cancers after prostate cancer [2] [6] and 19th among all cancers [7]. It is reported that bladder cancer is diagnosed in about 430,000 patients a year worldwide and it is a cause of death in 200,000 patients worldwide [2] [8]. Moreover, there is a male predominance with a ratio of approximately 3:1 [8] [9]. Usually, patients affected with this pathology, present in most of the cases with macroscopic, gross or visible haematuria and/or dysuria [8] [10]. Others can present with irritative urinary symptoms or incidental findings during an imaging [8] [11].

Treatment of ABCs depends on staging of the disease. There are a plethora of treatments going from chemotherapy to surgical resection. Radical cystectomy and lymphadenectomy are standard treatment modalities for invasive bladder cancer [12]. Intra-vesical BCG is an immunotherapy that reduces the risk of recurrence and progression by 70% and 27% respectively; radical radiotherapy can also be used. Patients with advanced metastatic bladder cancer are normally treated with systemic therapy using chemotherapy [1] [9] [11] [12]. Also, the preferred initial treatment

for patients with metastatic bladder cancer is a combination of chemotherapy including cisplatin [13]. Five-year survival of patients with inoperable, advanced urothelial carcinoma treated with the first-line chemotherapy is 5% - 15% [9] [14]. A poor prognosis is noted when distant metastasis of bladder cancer occurs [9]. Data on the outcome of ABCs are still scarce. Prognosis or outcome of bladder cancers varies on different histologies and treatment modalities used [15].

2. Materials and Methods

2.1. Study Design, Setting and Participants

The study was a retrospective descriptive analysis conducted over 10 years, from January 1st, 2013 to December 31st, 2022. It took place in the oncology units of Yaoundé and Douala General Hospitals. Our study population comprised the medical records of all patients with histologically confirmed bladder cancer during this time frame. The inclusion criteria focused on advanced bladder cancer cases (stages T3 and above according to TNM classification) that were hospitalized within the past decade and exhibited evidence of metastases on imaging studies. We excluded records lacking imaging results and those with incomplete anamnesis data. Retrospective data were gathered from medical reports utilizing a pretested extraction form.

2.2. Study Procedure

This study commenced after receiving ethical clearance from the Institutional Review Board of the Faculty of Health Sciences at the University of Buea, as well as other necessary administrative authorizations. Participants' confidentiality was maintained; no patients' names or identity card numbers were collected, and the data obtained from hospital records was kept confidential and used solely for research purposes.

2.3. Participant's Enrollment

A total of 10,684 files of oncology patients were reviewed in the YGH and DGH during our period of study. We had 7703 (72.09%) files from the YGH and 2981 (27.90%) files from DGH. We included 54 files in our study and excluded 12 (18.18%) files. We excluded records without histological confirmation, those missing key clinical data such as treatment history, absence of imaging records, and duplicated patients record (**Figure 1**).

2.4. Data Collection, Management and Analysis

Data were extracted retrospectively using a standardized pretested data extraction form developed in Microsoft excel 2019. The form was structured to collect information on: 1) Socio-demographic characteristics including age, region of origin, marital status, and occupation; 2) Clinical features such as date of diagnosis, symptoms, duration of symptoms, imaging modalities, and sites of metastases; 3) Treatment modalities encompassing surgery, hormonal therapy, radiotherapy,

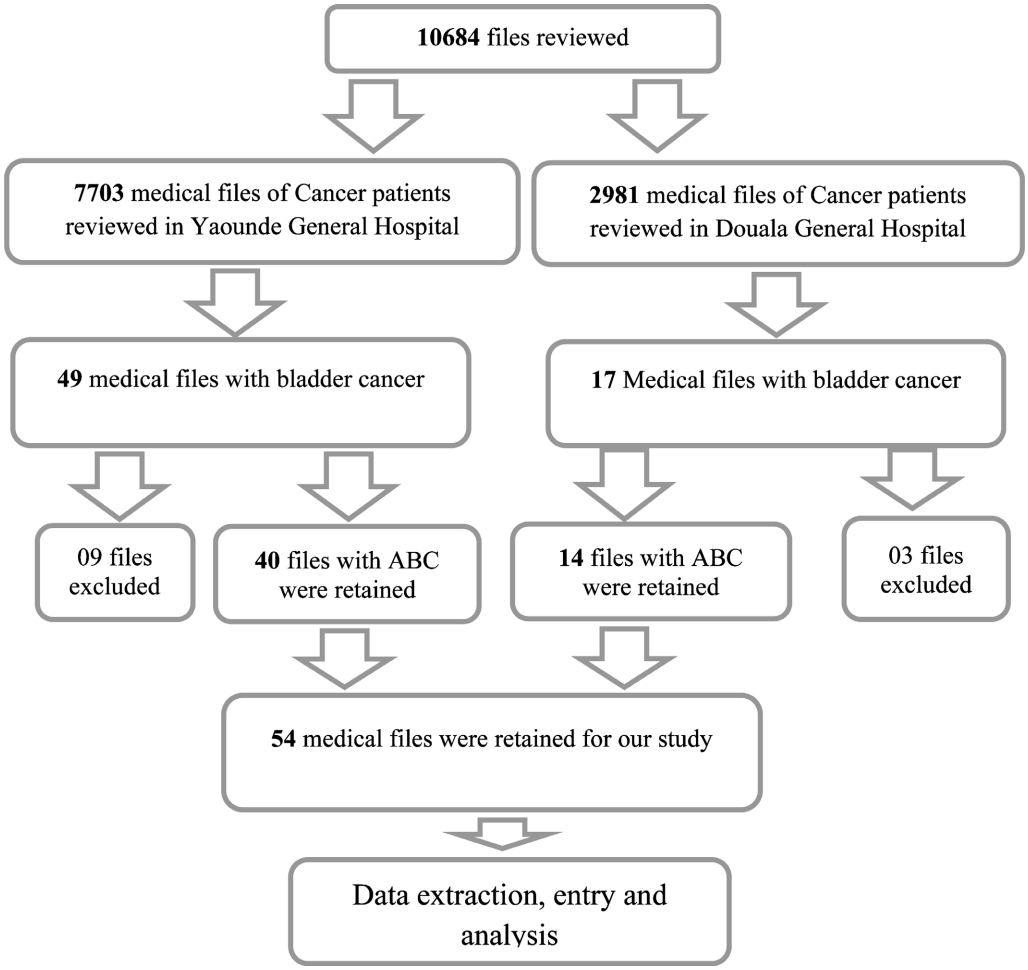


Figure 1. Flow chart showing patient recruitment.

chemotherapy, or no treatment; and 4) Outcomes related to treatment response, including progression, regression, and stability.

To ensure data data validity and reliability, pre-testing was done with 10 files at the Douala General hospital. The extracted data were recorded were cleaned, checked for duplication and entered in Microsoft Excel version 2019 ensuring anonymity and password protected. The data were analyzed using Statistical Package for Social Sciences (SPSS) software, version 26 for Windows. Categorical variables were summarized with frequencies and percentages, while continuous variables were summarized using mean and standard deviation.

The primary outcome of this study was the prevalence of ABC among all cancer cases reviewed at the YGH and DGH over a 10 year period. Secondary outcomes included treatment response assessed through CT findings and clinical documentations, patterns of metastasis and treatment modalities.

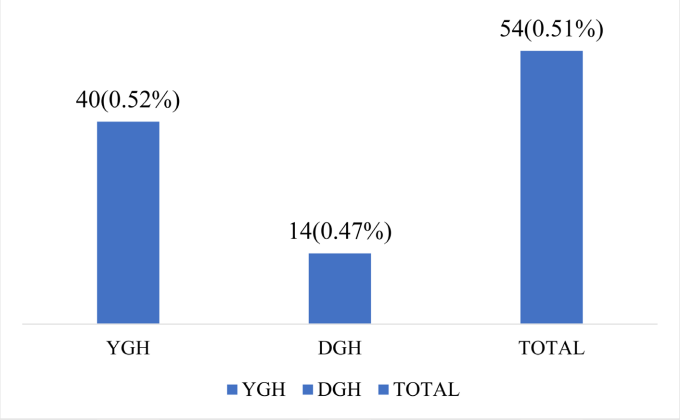
3. Results

3.1. Prevalence and Risk Factors of Advanced Bladder Cancer

A total of 54 participants were included in the study following a review of 10,684

medical records from both hospitals. Of these, 40 cases were identified at Yaoundé General Hospital (YGH) and 14 at Douala General Hospital (DGH), corresponding to a prevalence of 0.52% in YGH and 0.47% in DGH, and an overall prevalence of advanced bladder cancer across the two hospitals was 0.51% (see Figure 2).

The number of patients with ABC showed and increasing trend over the years. According to the findings of our investigation, there were 3 instances in 2013 and 10 patients by 2022 (see Figure 3).



Key: YGH: Yaoundé General Hospital, DGH: Douala General Hospital.

Figure 2. Prevalence of advanced bladder cancer in both YGH and DGH.

Figure 3. Trend in prevalence of advanced bladder cancer.

3.2. Socio-Demographic Characteristics of Participants

Of the 54 participants in the study, 33 (61.1%) were of the age group 50 - 69, and 14 (25.9%) cases were between 24 - 49 years with a mean age of 56.78 ± 14.25 years (range = 24 - 80 years). 31 (57.4%) were males with a male to female sex ratio found was 1.3:1. 41 (75.9%) were married (as illustrated in Table 1).

Table 1. Sociodemographic characteristics of participants.

Variable	Category	Frequency	Percentage (%)
Age category (years) Mean = 56.78 ± 14.25	24 - 49	14	25.9
	50 - 69	33	61.1
	70 - 80	7	13.0
	Total	**54**	**100**
Sex	Female	23	42.6
	Male	31	57.4
	Total	**54**	**100**
Occupation	House-wife	14	25.9
	Private sector	23	42.6
	Public sector	5	9.3
	Retired	12	22.2
	Total	**54**	**100**
Marital status	Married	41	75.9
	Single	9	16.7
	Widow	4	7.4
	Total	**54**	**100**

The results of the study equally show that the regions of origin with the most cases were the center region with 22 (40.7%) cases followed by the west region with 14 (25.9%) participants (Figure 4).

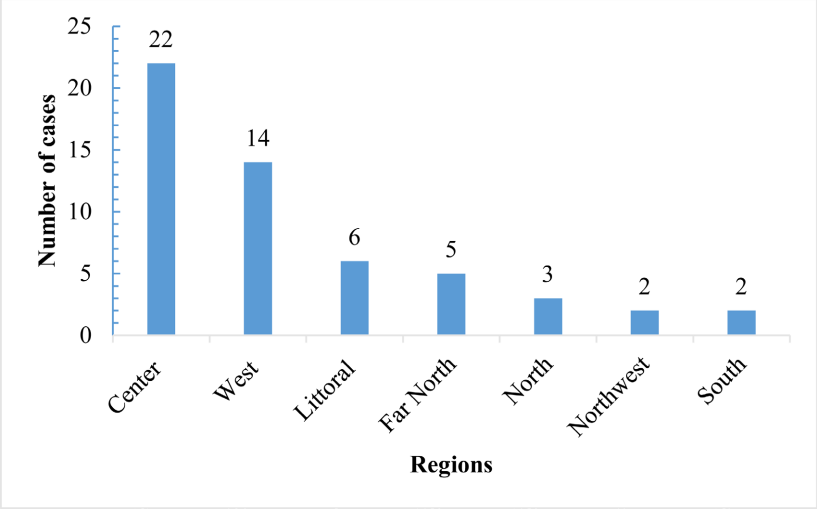


Figure 4. Distribution of ABC cases by region of origin.

3.3. Clinical Features of Advanced Bladder Cancer

The most common clinical presentation on admission was hematuria 46 (85.2%),

followed by back pain 4 (7.4%). 21 (38.9%) were graded T3 and 21 (38.9%) graded T4 from TNM classification (Table 2).

Table 2. Clinical presentation on admission.

Variable	Category	Frequency	Percentage
Clinical presentation on admission	Back pain	4	7.4
	Dysuria	2	3.7
	Hematuria	46	85.2
	Other	1	1.9
	Weak stream	1	1.9
	Total	**54**	**100**
TNM	T2	12	22.2
	T3	21	38.9
	T4	21	38.9
	Total	**54**	**100.0**

Different diagnostic modalities were used by the two hospitals for diagnosis and extension of the disease. The Computed tomographic scan (CT) scan was used in 28 cases (51.9%), followed by Cystoscopy 25 (46.3%), then MRI which accounted for 5 (9.3%) (Figure 5). The lungs 11 cases (20.4%) followed by the vertebrae 10 (18.5%) were the most common site of secondary localization (metastasis) (see Figure 6).

3.4. Management of Advanced Bladder Cancer in the Yaounde and Douala General Hospitals

Initially, 21(38.9%) of the cases reviewed had a surgery for the management of the bladder cancer of which; 13 cases had a trans-urethral resection of the bladder tumor (TURBT) (Table 3).

Among the current treatment modalities used, Chemotherapy was the most

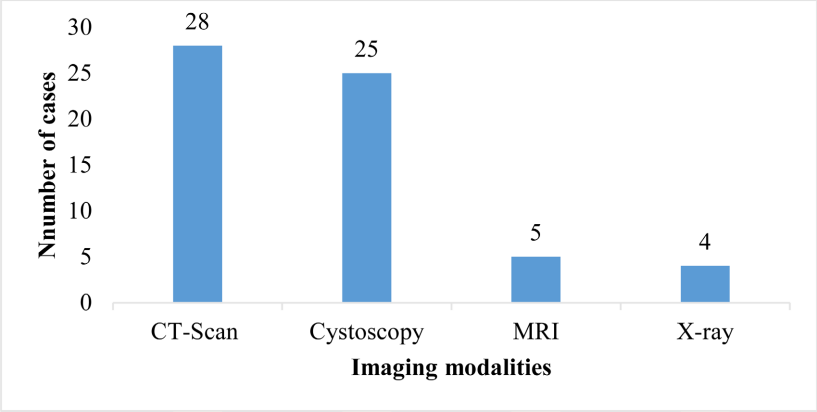


Figure 5. Diagnostic modality used for extension of ABC in the DGH an YGH.

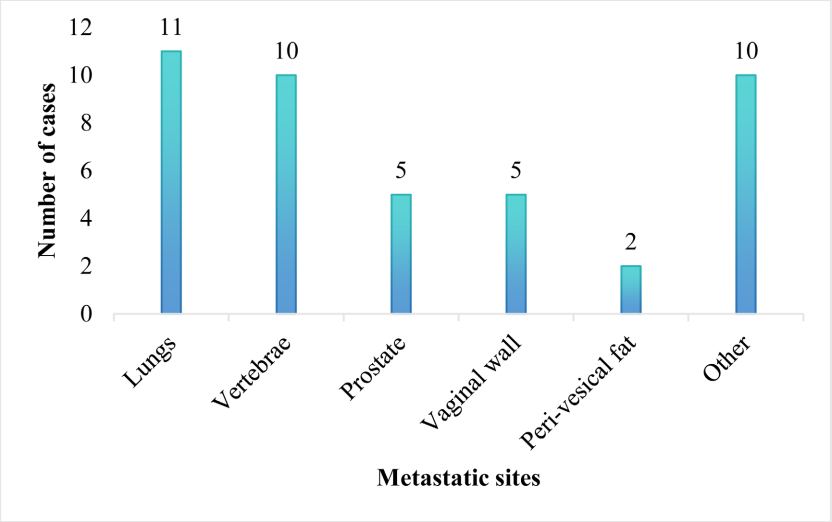


Figure 6. Metastatic sites in patients with ABC in the YGH and DGH.

Table 3. Prior treatment modalities in patients with ABC.

Variable	Category	Frequency	Percentage
Previous therapy	Surgical treatment	21	38.9
	Radiotherapy	4	7.4
	Radiotherapy and chemotherapy	2	3.7
	Chemotherapy	2	3.7
	No treatment	25	46.3
	Total	**54**	**100**
Surgical modalities used	Endoscopic resection of the bladder CA	5	23.8
	Partial cystectomy	2	9.5
	Radical cystectomy	1	4.8
	TURBT	13	61.9
	Total	**21**	**100.0**

explored treatment option 32 (59.3%) for both curative and palliative purposes (Figure 7). Carbogemzar was the most commonly used protocol (56.3%) followed by Carbotaxol protocol (Table 4).

3.5. Treatment Outcome in Patients with ABC

The average duration of follow-up of patients with ABC at the DGH and YGH was 4 months. Majority of the cases (40 cases) were lost to follow up and 11 cases showed evidence of disease progression on imaging (Table 5).

4. Discussions

4.1. Prevalence of Advanced Bladder Cancer

The prevalence of ABC in our study was of 0.51% among cancer patients over our

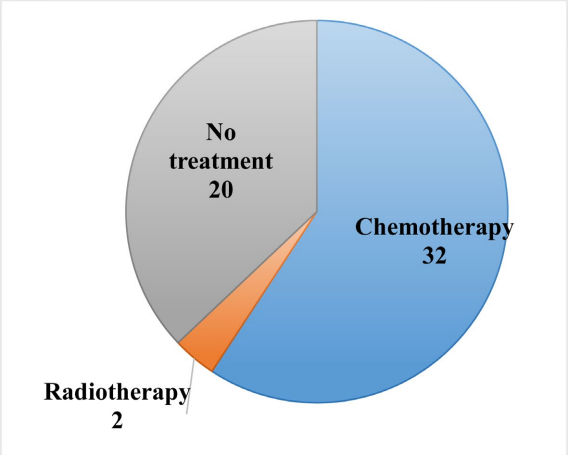


Figure 7. Treatment modalities for ABC at the DGH and YGH.

Table 4. Different chemotherapy protocols used by each hospital.

	Hospitals	Category	Frequency	Percentage
Chemotherapy	DGH	Carbogemzar	3	21.4
		CDDP-gemcitabine	1	7.14
		CDDP-5FU	1	7.14
		MVAC	1	7.14
		Total	**6**	**42.85**
	YGH	Carbogemzar	15	37.5
		Carbotaxol	9	22.5
		CDDP-Taxol	1	2.5
		MVAC	1	2.5
	Total		**26**	**65**

Table 5. Treatment outcomes in patients with ABC at the DGH and YGH.

Variable	Category	Frequency	Percentage
Results following treatment	Lost to follow up	40	74.1
	Progression	11	20.4
	Regression	3	5.6
	Total	**54**	**100**

10 years of study. This prevalence is very low when compared to other studies done in Cameroon, by Engbang *et al.* Who reported a prevalence of 14.16% (96 cases) in 2014 and 16.1% (122 cases) in 2022 [2] [16] respectively and a prevalence of 12.1% (7 cases) reported by Sando *et al.* [15]. This difference can be explained by the different population considered. The authors in the previous study only considered urologic cancers in their prevalence, meanwhile in the current study

all cancer patients found in oncology units were used as the denominator accounting for the lower prevalence.

The mean age of our patients was 56.78 ± 14.2 (Range 24 - 80 years) and the most represented age group was 50 to 69 years. This result is in accord with the study done by Engbang *et al.* [16] which reports a mean of 58.0 ± 13.3 (Range 24 - 91 years), Niang L *et al.* [17] and Diao B *et al.* [18]. Our result is high as compared to the mean age of 49.3 ± 23.7 years reported by Sando *et al.* in Yaounde [15].

Advanced bladder cancer was more common in men with a Male to female ratio 1.3, which is similar to a study in Cameroon which reported a sex ratio of 1.5 [2] and in a study in Middle Africa with a male to female ration of 1.8 [19]. However, this is low compared to 6.25 [15] and 2.46 [17].

4.2. Clinical Features of Advanced Bladder Cancer

Many patients affected with advanced bladder cancer present differently. Symptoms can be, macroscopic haematuria, dysuria, lower back pain or many others. In this study, macroscopic haematuria was the most common motive of consultation among these patients (in 46, (85.2%) cases). The same results have been reported in other studies 53% in UK [10], 80% US [20], 80 cases (65.6%) in Cameroon [15] and in other African studies [17] [21] who found gross hematuria accounting for 77.5%, and 61.1% of the presenting symptoms respectively.

The multiple metastasis found in our study along with the long and slow evolution of the disease are consistent with the late referral. Such a feature is common in most African series. Lung metastasis was the most prevalent distant secondary localization in our study consistent with previous studies [22] [23].

4.3. Therapeutic Outcome

In the present study, chemotherapy 32 (59.3%) was the most commonly used treatment modality in patients with advanced bladder cancer with Carbo-gemzar protocol 18 (33.3%) being the most widely use molecules. This can be explained the availability of the molecules and the decreased level toxicity as compared to other protocol like MVAC (methotrexate, vinblastine, doxorubicin, and cisplatin) [11]. It should equally be noted that most of these patients 21 (38.9%), placed on chemotherapy previously surgery for treatment of the bladder cancer. 14 (25.92%) of which was by TURBT. This is supported by a study in Senegal done in 2018 by Cissé *et al.* [24], although literature encourages radical cystectomy with lymphadenectomy as gold standard treatment of muscle invasive bladder tumour (T2 - T4) [12] [25].

The mean duration of follow-up of patients was 143.6 days ± 312.09, and an average duration of follow up of 4 months. This is better compared with the mean duration of 2.2 months found in Cameroon, Douala by Engbang *et al.* [2] but falls short of the overall follow-up time of 7.9 months and 48.5 months in the study done in USA and France by Flannery *et al.* [20] and George *et al.* [26]. These differences in average duration of follow-up can be explained by the difference in quality of the various hospitals, services offered and treatment modalities and pro-

tocol used. Most of the patients in the current study were lost to follow up. This would be justified either by an altered general condition preventing continuation of this chemotherapy or by the expensive cost of chemotherapy in our context, although it is subsidized.

4.4. Limitations

This study had some limitations that should be considered when interpreting the findings. The study relied entirely on retrospective medical record review, which limited the control over data completeness, accuracy and standardization across patients record. Furthermore, a significant number of files were excluded due to missing data which may have introduced selection bias and affected the generalization of our findings. Additionally, due to limited follow-up duration, and high loss of follow-up, we could not assess overall survival which is a critical indicator in prostate cancer prognosis. The findings reflect the experience in two tertiary urban hospitals and may not represent the broader national situation

5. Conclusion

This study provides important insights into the prevalence, clinical characteristics, and treatment patterns in patients with advanced bladder cancer in two major referral Hospitals in Cameroon. A rising trend in cases was observed with lung metastasis as the predominant presentation and chemotherapy as the most frequently used treatment option. While some patients showed signs of clinical and radiologic improvement, treatment response data were limited. Given the nature of the study, high rate of incomplete data and lack of data on long term outcome, these findings should be interpreted as exploratory rather than definitive. That notwithstanding, the study highlights critical gaps in early diagnosis, imaging follow-up, and consistent treatment pathways. Efforts to improve bladder cancer screening programs, develop national treatment protocol and improve cancer registry are urgently needed to enhance patient outcomes in Cameroon.

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Ethical Approval

The study was performed following the Declaration of Helsinki and approved by the appropriate ethics committee. All data were anonymized before the authors received the data. All methods were performed by the relevant guidelines and regulations.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Abbreviations

ABC	Advanced Bladder Cancer
CT-Scan	Computerized Tomography Scan
DGH	Douala General Hospital
YGH	Yaounde General Hospital.