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Common Complications in Late-Stage Bladder Cancer: A Five-Year Retrospective Study from a Nigerian Tertiary Hospital

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Abstract

Background: Bladder cancer is a common malignancy of the urinary tract and one of the leading causes of cancer-related illness and death worldwide. Even with advances in diagnosis and treatment, patients in many low- and middle-income countries still present with advanced disease and systemic complications. This is mostly because of late presentation and poor access to specialized care. **Aim:** This study recounts the demographic features, histological patterns, clinical presentation, and common complications of late-stage bladder cancer in patients treated at Federal Medical Center, Ebute Metta. **Methods:** We carried out a retrospective descriptive case series of all patients admitted with radiologically suspected bladder cancer between January 2021 and May 2026. Clinical records provided data on demographic features, presenting complaints, laboratory and radiological investigations, and histological diagnoses. Data were analyzed using descriptive statistics. **Results:** Eleven cases of radiologically suspected bladder cancer were included in the study: six males (54.5%) and five females (45.5%), with a male-to-female ratio of 1.2:1. The mean age was 55 ± 8.64 years (range: 42 - 68 years). Eight patients had histological diagnoses; five (62.5%) had urothelial carcinoma, and three (37.5%) had adenocarcinoma. The most common presenting complaint was painless visible hematuria. Anemia and renal impairment were the main complications, each affecting ten (90.9%) patients. The median hemoglobin concentration was 6.9 g/dL (range: 3.3 - 9.3 g/dL), median serum creatinine was 345 µmol/L (range: 56.5 - 1201 µmol/L), and median serum urea was 17.9 mmol/L (range: 2.5 - 64 mmol/L). **Conclusion:** Patients with bladder cancer in our environment usually present late. Severe anemia and renal impairment are the most common complications which can increase patient morbidity. Public

awareness that promotes early diagnosis and prompt specialist referral are needed.

Keywords

Bladder Cancer, Common Complications, Anemia, Renal Impairment

1. Introduction

Bladder cancer is a common urological malignancy that arises mainly from the urothelial lining of the urinary bladder. It has one of the highest recurrence rates among all cancers and causes major illness and death globally. The Global Cancer Observatory (GLOBOCAN) estimated about 614,302 new cases and 220,596 deaths from bladder cancer worldwide in 2022, making it the ninth most commonly diagnosed malignancy [1].

Bladder cancer burden differs across regions due to differences in environmental and occupational exposures, tobacco consumption, and endemic infectious diseases. Europe and North America report the highest incidence rates; however, mortality rates remain unequally high in many African countries because patients often present late. Africa recorded about 37,064 new bladder cancer cases in 2022, with North Africa accounting for a major portion due to endemic urinary schistosomiasis [2] [3].

Bladder cancer is predominant in men, with an approximate male-to-female ratio of 3:1. Most patients are diagnosed in their sixth and seventh decades of life [4]. The higher incidence among men is largely attributed to greater exposure to tobacco smoking, occupational carcinogens (such as aromatic amines and polycyclic aromatic hydrocarbons), and hormonal influences [5]. Other risk factors include recurrent urinary tract infections (UTI), pelvic radiation, cyclophosphamide therapy, prolonged catheterization, arsenic-contaminated drinking water, and chronic inflammation from Schistosomiasis [5] [6].

Urothelial carcinoma accounts for about 90% of bladder cancers in developed countries [7]. Squamous cell carcinoma constitutes almost 5% - 7% of cases and is common in regions with schistosomiasis endemicity. Adenocarcinoma accounts for less than 2% of bladder cancers and often links to urachal remnants, bladder exstrophy, or chronic bladder mucosa irritation [7] [8].

The clinical presentation of bladder cancer depends on tumor stage. Painless visible hematuria occurs in about 80% - 90% of patients [9]. Other symptoms include lower urinary tract storage symptoms, recurrent UTI, pelvic pain, flank pain (from ureteric obstruction), weight loss, and constitutional symptoms. However, these symptoms are usually ignored or treated empirically in many low-resource settings, leading to delayed referral and diagnosis.

Several Nigerian studies reveal that most patients present with muscle-invasive or metastatic disease, often after many months of persistent hematuria [3] [9].

Financial constraints, poor awareness of warning symptoms, cultural beliefs, and poor access to specialist urological services contribute to delayed hospital presentation [10].

Late-stage bladder cancer has several life-threatening complications. Persistent hematuria causes severe anemia, necessitating repeated blood transfusions [11]. Progressive tumor invasion into the ureteric orifices leads to bilateral ureteric obstruction, hydronephrosis, and obstructive nephropathy, culminating in acute kidney injury or chronic kidney disease [12]. Also, urosepsis, venous thromboembolism, cachexia, and metastatic disease increase morbidity and mortality [13].

Anemia in advanced bladder cancer has multiple causes, including chronic blood loss, systemic inflammation, nutritional deficiencies, renal impairment, and marrow suppression from advanced malignancy [14]. Obstructive nephropathy frequently necessitates emergency urinary diversion via ureteric stenting or percutaneous nephrostomy before definitive treatment [12].

Severe anemia predisposes patients to cardiac decompensation and perioperative morbidity, while advanced renal impairment often delays definitive surgery or systemic chemotherapy. Consequently, prolonged hospital admissions, repeated blood transfusions, dialysis, and palliative interventions increase healthcare costs in resource-constrained environments [11] [12].

Although several studies describe the epidemiology of bladder cancer in Nigeria, only few examine the complications associated with late-stage disease. Characterizing these complications is crucial for improving clinical preparedness, optimizing multidisciplinary management, and guiding public health strategies aimed at promoting earlier diagnosis.

This study therefore describes the demographics, histology pattern, clinical presentation, and common complications of late-stage bladder cancer among patients treated at Federal Medical Center, Ebute Metta, over a five-year period.

2. Methods

2.1. Study Design

This was a retrospective case series.

2.2. Study Setting

The study took place at Federal Medical Center, Ebute Metta, Lagos, which provides specialist urological services to patients referred from primary, secondary, and private healthcare facilities in the region.

2.3. Study Population

The study included all patients admitted with radiologically suspected bladder cancer between January 2021 and May 2026.

Inclusion criteria

Patients with radiological evidence of bladder cancer.

Exclusion criteria

Patients without radiological evidence of bladder cancer.

2.4. Data Collection

Information was obtained from patients' clinical notes, admission registers, theatre records, laboratory and radiological reports, and histology reports. Variables collected included: age, sex, presenting complaints, histological diagnosis, hemoglobin concentration, and serum creatinine and urea levels.

2.5. Statistical Analysis

Data were entered into tables and analyzed using an online statistical calculator (Calculator.net, https://www.calculator.net/mean-median-mode-range-calculator). Continuous variables were summarized using means and standard deviations for normally distributed data, and medians with ranges for skewed variables. Categorical variables were expressed as frequencies and percentages.

2.6. Ethical Consideration

Ethical approval came from the Institutional Health Research Ethics Committee (Approval Number: HREC 26 - 60). Patient confidentiality was maintained throughout the study.

3. Results

During the five-year study period, eleven patients with radiologically suspected bladder cancer met the inclusion criteria. Patient ages ranged from 42 to 68 years, with a mean age of 55 ± 8.64 years. Six patients (54.5%) were male, and five (45.5%) were female, resulting in a male-to-female ratio of 1.2:1. Painless visible hematuria was the most common presenting complaint. Other presenting features included lower urinary tract symptoms, flank pain, weight loss, and symptoms linked to anemia and renal failure. Histology diagnosis was available for eight patients: urothelial carcinoma accounted for five cases (62.5%), and adenocarcinoma for three (37.5%).

Anemia and renal impairment were the most frequent complications at presentation. While all the patients had anaemia, 6 patients (54.5%) had severe anemia (Hemoglobin of <7.0 g/dL refers to severe anaemia [15]), and ten (90.9%) also showed signs of renal impairment (Creatinine ≥ 140 μmol/L in males and ≥120 μmol/L in females [16]).

Laboratory results revealed abnormalities consistent with advanced disease. The median hemoglobin concentration was 6.9 g/dL (range: 3.3 - 9.3 g/dL), reflecting severe chronic blood loss. The median serum creatinine concentration was 345 μmol/L (range: 56.5 - 1201 μmol/L), while the median serum urea concentration was 17.9 mmol/L (range: 2.5 - 64 mmol/L), indicating varying degrees of obstructive nephropathy. These findings, summarized in **Table 1**, indicate the advanced stage at which most patients presented and systemic complication bur-

den accompanying delayed diagnosis.

Table 1. Biodata, hematological and chemical pathology results of patients.

	Age (years)	Gender	Hemoglobin (g/dl)	Creatinine (μmol/L)	Urea (mmol/l)
1.	54	Male	8.8	559.4	13.2
2.	43	Female	8.3	722	23.5
3.	42	Male	6.9	71	4.3
4.	68	Male	5.9	268	17.7
5.	63	Female	6.7	92	19.6
6.	59	Male	9.2	308.5	25.3
7.	60	Male	5.3	1201	64
8.	64	Female	6.3	56.5	2.5
9.	52	Female	3.3	1047	39.4
10.	53	Female	8.5	345	9.3
11.	47	Male	9.3	348	17.9

4. Discussion

Bladder cancer is a common urological malignancy worldwide [1]. It poses a major public health issue due to its high incidence, recurrence rate, treatment costs, and associated complications. Developed countries have better outcomes via better diagnostics, endoscopic intervention, multi-modal therapy, and surveillance, however, patients in many low- and middle-income countries still present with advanced disease. This study affirms that observation, showing most patients had severe complications like anemia and kidney impairment.

The average age of 55 ± 8.64 years in this study is similar to other Nigerian reports [3] [6]. This is slightly younger than the average in Europe and North America, where incidence peaks in the sixth and seventh decades [2] [4]. Many factors may explain this age difference, including Africa's younger population distribution, varying environmental exposures, endemic schistosomiasis, and different life expectancies between developed and developing nations.

Bladder cancer affects men far more than women, with global male-to-female ratios around 3:1 [4]. Our study, however, found a narrower ratio of 1.2:1. This closer sex distribution has also occurred in some other African studies [3]. This pattern in our study maybe due to the small sample size, though it could also point to changing exposure to known carcinogens such as cigarette smoking, biomass smoke, industrial chemicals, and recurrent UTI [5]. Increased healthcare use among females may also contribute to better case detection.

Urothelial carcinoma was the prominent histological variant, making up 62.5% of confirmed cases. While this agrees with the fact that urothelial carcinoma dominates worldwide, our observed proportion is lower than the approximately 90%

reported in developed countries [5]. Many African studies have also recorded higher proportions of squamous cell carcinoma and adenocarcinoma. This is mainly because of chronic inflammation, recurrent UTI, prolonged catheter use, and Schistosomiasis endemicity [3] [5] [8]. In our study, adenocarcinoma accounted for 37.5% of confirmed cases. Due to the small sample size, these proportions require cautious interpretation.

Painless visible hematuria was the commonest symptom in this study, consistent with reports from both developed and developing countries [9]. Visible hematuria is the main symptom of bladder cancer and usually the earliest sign. Despite this classic presentation, many patients in resource-limited settings delay seeking medical aid because the hematuria is initially intermittent and painless. Hematuria is sometimes wrongly treated empirically for UTI or schistosomiasis at primary healthcare facilities before specialist referral. Hence, opportunities for early diagnosis are often missed, allowing the disease to progress to muscle-invasive or metastatic stages.

The high prevalence of complications due to delayed presentation in this study reflects an ongoing challenge across sub-Saharan Africa. Various factors lead to delayed presentation, including low public awareness of bladder cancer symptoms, poor access to specialist urological services, financial constraints, deficient health insurance, and sociocultural beliefs. Delayed diagnosis may lead to poorer outcomes, higher treatment costs, reduced eligibility for curative interventions, and lower survival rates [1] [6].

Anemia affected over 90% of patients; primary complication of advanced bladder cancer. A median hemoglobin concentration of 6.9 g/dL indicates severe anemia, usually requiring urgent blood transfusion. Cancer-related anemia has multiple causes: chronic hematuria, iron deficiency, systemic inflammation, reduced erythropoietin production from kidney impairment, nutritional deficiencies, and bone marrow infiltration [14]. Severe anemia can delay definitive surgical or systemic oncological treatment, as hemoglobin optimization is necessary before major procedures.

Renal impairment was also common, affecting over 90% of patients. The high serum creatinine and urea levels in this study strongly suggest obstructive nephropathy. This can be from the tumor involving the ureteric openings or externally compressing the distal ureters. Obstructive uropathy is a known complication of muscle-invasive bladder cancer, usually requiring emergency decompression via retrograde ureteric stenting or percutaneous nephrostomy before definitive treatment [7]. Persistent obstruction can lead to permanent nephron loss, chronic kidney disease, and uremia. Renal impairment restricts the use of cisplatin-based chemotherapy, which is the standard first-line systemic treatment for eligible patients with muscle-invasive and metastatic urothelial carcinoma [1].

The severe anemia and renal impairment observed in this study reflects late presentation and usually occur together because prolonged hematuria, chronic inflammation, and obstructive nephropathy interplay, leading to worsening phys-

iological status. Multidisciplinary approach involving urologists, nephrologists, anesthetists, oncologists, hematologists, radiologists, and specialist nurses is hence often required. Initial stabilization requires hemoglobin and renal function optimization, electrolyte imbalance correction, UTI treatment, and urinary diversion, when indicated, before definitive treatment.

Other complications of advanced bladder cancer may include recurrent UTI, urosepsis, vesicocutaneous fistulae, pelvic pain, pathological fractures from bone metastases, venous thromboembolism, and malignant ureteric obstruction [11]-[13]. Early recognition and prompt management of these complications will help to improve patient outcomes and reduce mortality.

These findings have important implications for healthcare in Nigeria and other regions with limited resources. Public awareness campaigns should stress that painless visible hematuria should never be dismissed, as it can be an early indicator of bladder cancer. Primary care physicians also need to consider bladder cancer when assessing patients with visible hematuria, especially those with relevant risk factors. Prompt referral for cystoscopy is crucial to prevent delays caused by repeated empirical treatments. Improving access to diagnostic services, including cystoscopy, imaging, transurethral resection of bladder tumors (TURBT), and histology, alongside expanding health insurance coverage, could lead to earlier diagnoses and reduce financial barriers to treatment. This study offers insight into the complications of advanced bladder cancer at a Nigerian tertiary institution, particularly the high prevalence of severe anemia and renal impairment. It also adds to the limited data on the complications of late bladder cancer presentation in sub-Saharan Africa.

However, the retrospective design, small sample size, and single-center setting may restrict generalizing the findings. Also, incomplete records on tumor stage, treatment, recurrence, and long-term survival limited further analysis. Despite these limitations, the study underscores the clinical burden of delayed presentation and the necessity for earlier diagnosis and better access to care.

5. Conclusion

Patients with bladder cancer at our facility usually present late, with severe anemia and renal impairment. Early diagnosis will require: improving public awareness of painless visible hematuria, strengthening referral systems, and expanding access to cystoscopy, and health insurance. A multidisciplinary approach is vital for enhancing patient care and outcomes. To better understand the presentation, treatment outcomes, and survival patterns of bladder cancer in Nigeria, further multicentre studies with larger patient populations are necessary.

Ethical Approval

The study protocol was approved by the Institutional Health Research Ethics Committee (Approval Number: HREC 26-60). Patient confidentiality was maintained by making all data anonymous, and compliance with the ethical principles

outlined in the Declaration of Helsinki ensured.

Informed Consent

The Institutional Health Research Ethics Committee waived individual informed consent due to the retrospective nature of the study.

Author Contributions

Conceptualization, Oladimeji; methodology, Oladimeji and Nwofor; writing—original draft preparation, Oladimeji, writing—review and editing, Oseni, Apata, Ogunjimi. All authors have agreed to the published version of the manuscript.

Conflicts of Interest

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

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