

Urogenital Cancers: Epidemiological, Clinical, and Therapeutic Evolution

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Abstract

Introduction: Urological cancers encompass a range of malignant tumors affecting the main organs of the urinary tract in both sexes, as well as the male genital system. In sub-Saharan Africa, available data on urogenital cancers are primarily derived from hospital-based statistics. In Senegal, the majority of urogenital cancers are diagnosed at locally advanced and/or metastatic stages. In recent years, we have observed an increasing frequency of urological cancers in our departments, accompanied by rising mortality. The aim of this study was to describe the epidemiological, clinical, and progressive characteristics of these cancers in the two hospitals of Ziguinchor, and to evaluate their management. **Patients and Methods:** We conducted a retrospective, multi-center, descriptive study over a 5-year period (January 1, 2018 to December 31, 2022). Included were all patients hospitalized for confirmed urogenital cancers and receiving treatment. Patients with incomplete files or followed as outpatients were excluded. The parameters studied included epidemiological, clinical, paraclinical, therapeutic, and outcome-related data. **Results:** We recorded 203 cases of urological cancers, with a peak in 2021 representing 26% of the cases. The most frequent cancer sites were: prostate 69% (n = 140), bladder 22% (n = 44), kidney 5% (n = 11), and testis 4% (n = 8). The mean age of patients was 66 years (range: 2 - 95 years), with the most common age group being 60 - 70 years (37%). There was a marked male predominance (91%). The average time to consultation was 95 days (range: 4 - 750 days). Dysuria, followed by pollakiuria and hematuria, were the main reasons for consultation. Total prostate-specific antigen (PSA) was assessed in all prostate cancer cases, with a mean level of 1846 ng/mL. Ultrasound and thoraco-abdominal CT scans (CT

TAP) were performed in varying proportions depending on the cancer site. Treatment was predominantly surgical. During hospitalization, complications were reported in 31% (n = 62) of patients. Ten months after treatment, 29% (n = 55) demonstrated favorable outcomes, while the overall mortality rate was 12% (n = 23). However, 59% (n = 113) were lost to follow-up. **Conclusion:** Urogenital cancers are relatively common in routine urological practice. The confirmation of diagnosis often requires invasive procedures. In our context, a major challenge remains the late-stage diagnosis. Moreover, data are limited due to the absence of cancer registries in most African countries, including Senegal.

Keywords

Urological Cancers, Sub-Saharan Africa, Late-Stage Diagnosis, Prostate Cancer, Cancer Epidemiology

1. Introduction

Urological cancers include all malignant tumors affecting the organs of the urinary system in both sexes, as well as the male genital tract. It is estimated that in men, 1 in 5 cancers affects the urinary system, whereas in women, this proportion is 1 in 20 [1]. In sub-Saharan Africa, the available data on urogenital cancers are limited to hospital-based statistics [2]. This is primarily due to the lack of cancer registries in these developing countries. In Senegal, most urogenital cancers are diagnosed at a locally advanced or metastatic stage due to delayed referral to specialist care [2]. In recent years, we have observed a notable increase in the frequency of urological and male genital cancers in the urology departments of the regional hospital and the Peace Hospital in Ziguinchor. The aim of our study was to describe the epidemiological, clinical, and evolutionary characteristics of these cancers in the two hospitals of Ziguinchor and to evaluate their management.

2. Patients and Methods

We conducted a retrospective, descriptive, multicenter study (Peace Hospital and Regional Hospital of Ziguinchor) over a period of 5 years (January 1, 2018 to December 31, 2022). All hospitalized patients for urogenital cancers and treated in our urology departments during the study period were included. Excluded were patients with incomplete records and those managed on an outpatient basis. Data were collected from the medical records of hospitalized patients and hospitalization registers.

The parameters studied were:

- 1) Epidemiological: sex, age.
- 2) Clinical: type of cancer, time to consultation, medical history, reason for consultation, cancer location, histological type, and tumor stage.
- 3) Paraclinical: tumor markers (total PSA, β -hCG, alpha-fetoprotein), ultra-

sound, cystoscopy, MRI, and CT scan.

4) Therapeutic: surgery, chemotherapy, radiotherapy, and hormone therapy.

5) Evolutionary: length of hospital stays, complications, and survival.

Favorable outcome: absence or improvement of clinical signs (pain, dysuria, alteration of general condition), decrease in PSA levels after castration or undetectable after prostatectomy, absence of tumor residue or continued progression (ultrasound, CT scan, cystoscopy).

Qualitative variables were described using frequencies with proportions, and quantitative variables were expressed as means with standard deviations.

3. Results

We collected 203 cases of urological cancers, with a peak in 2021, accounting for 26% of the cases. The cancers by frequency of location were the prostate (69%, n=140), bladder (22%, n = 44), kidney (5%, n = 11), and testis (4%, n = 8) (**Figure 1**).

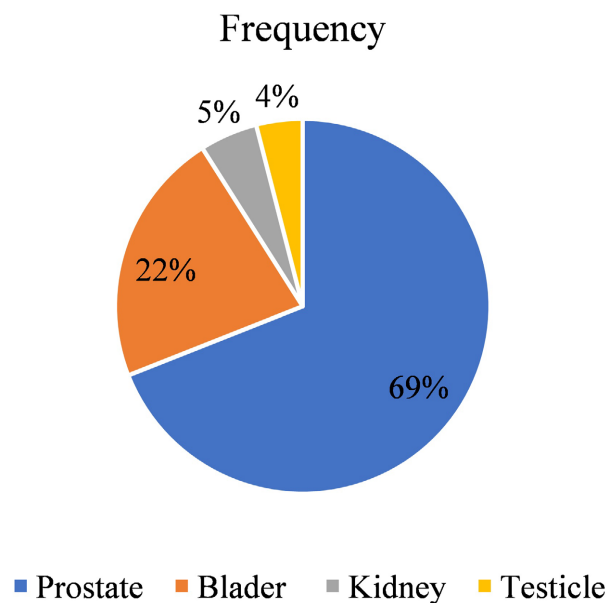


Figure 1. Frequency of urological cancers.

The mean age of patients was 66 years (range: 2 - 95 years), with the most represented age group being 60 - 70 years (37%). There was a marked male predominance (91%). Considering only cancers occurring in both sexes, the sex ratio was 1.64 (**Figure 2**). The average time to consultation was 95 days (range: 4 - 750 days). During hospitalization, evolution was favorable in 61% (n = 124) of patients; however, complications were reported in 31% (n = 62), including anemia (50%), general health deterioration (18%), abdominal pain (13%), electrolyte disturbances (13%), and bone pain (6%). Ten months after treatment, we observed a favorable outcome in 29% (n = 55) of patients and an overall mortality rate of 12% (n = 23), while 59% (n = 113) of patients were lost to follow-up.

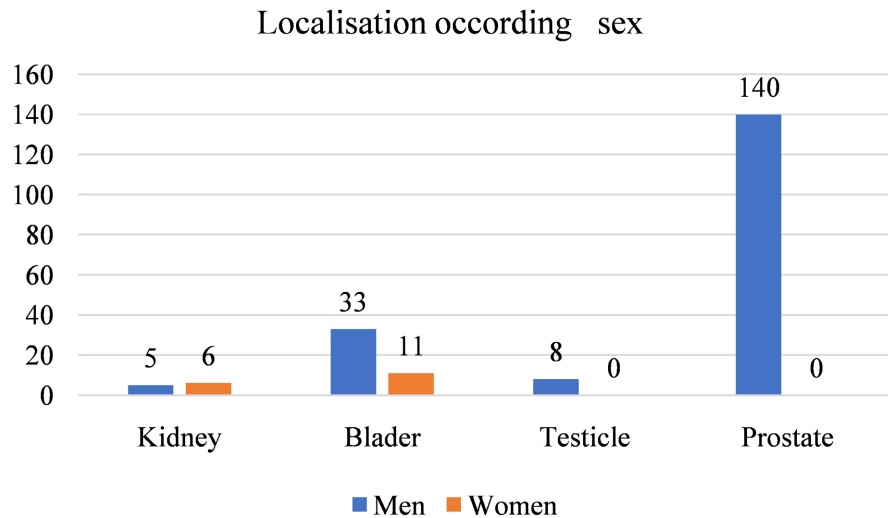


Figure 2. Cancer localisation according sex.

Prostate Cancer: Prostate cancer was the most frequent urological cancer in our study. The mean age was 70.01 years, with the 60 - 70 year age group being the most represented (36%, n = 51). Dysuria was reported in 23% (n = 78), followed by pollakiuria (18%, n = 61). General health impairment was observed in 10% (n = 14). On clinical examination, 86% of patients had lower urinary tract symptoms or chronic urinary retention. Bone metastasis symptoms (bone pain or paraplegia) were present in 4% (n = 5) at diagnosis. Digital rectal examination showed bilateral lobe involvement in 56 patients, and 42 had extra-prostatic extension (T4). Total PSA was measured in all patients, with a mean level of 1846 ng/ml [0.67 to 15,098 ng/ml].

Stage at diagnosis

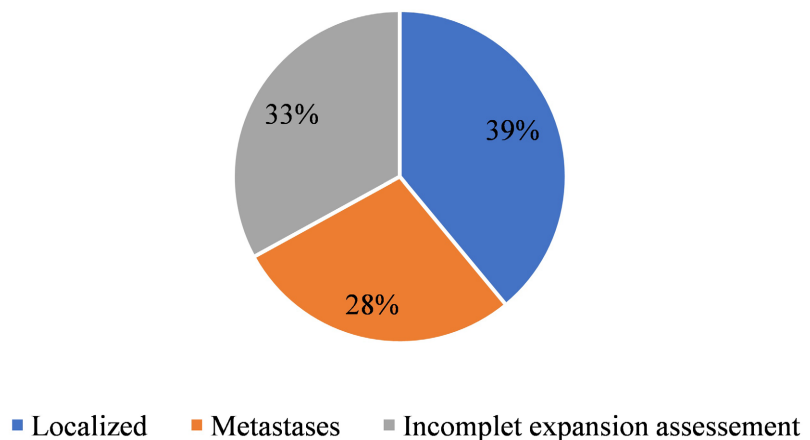


Figure 3. Distribution of patients according to stage at diagnosis (prostate cancer).

Ultrasound was performed in all cases, suggesting cancer through a heterogeneous and/or nodular prostate in 88.5% (n = 124). Imaging for staging included

CT scan (71%), plain X-ray (10%), MRI (5%), and bone scintigraphy (3%). Histology revealed adenocarcinoma in all cases. The Gleason score ranged from 6 to 9, with 30 patients scoring ≥ 8 . The cancer was localized or locally advanced in 39% (n = 52), while 33% (n = 46) were metastatic at diagnosis (**Figure 3**). Bone was the most frequent site of metastasis (70%, n = 32), particularly the thoracolumbar spine (84%), pelvis (12%), and shoulder (4%). Lung metastases were found in 15% (n = 7) and lymph node metastases in 6 patients. One case involved both pulmonary and lymphatic metastases.

Medical hormone therapy (anti-androgen or LH-RH analogue) was prescribed in 3% (n = 4) of inoperable metastatic patients. Testicular pulpectomy was the most commonly used treatment in 41% (n: 58) of patients, preceded by quarterly injections of LH-RH analogues in 33 patients who, for financial reasons, agreed to surgical castration. Radical prostatectomy was performed in 11% (n = 15). Obstructive symptoms were managed with transurethral resection of the prostate (TURP) in 11% (n = 16) and cervico-prostatic adenomectomy (CPA) in 4% (n = 5). TURP with orchiectomy was performed in 21% (n = 29), versus CPA with orchiectomy in 8% (n = 11). No radiotherapy was performed.

The mean hospital stay was 6 days (range: 1 - 28 days), with favorable evolution in 62% (n = 86). Complications were observed in 32% (n = 45), including anemia, abdominal or bone pain, and general deterioration. The in-hospital mortality was 5% (n = 7).

Bladder Cancer: Bladder cancer was the second most common urological cancer in our study. The mean age of patients was 61.3 years, with the age group 50 - 60 years being the most represented (32%, n = 14). Urogenital schistosomiasis was reported in 13% (n = 2) of cases, and smoking was identified in 4 patients.

Hematuria was the primary reason for consultation and was associated with lower urinary tract symptoms in 14 patients. Physical examination revealed an isolated hypogastric mass in 25% of cases and a tender mass in 14%.

Abdominal ultrasound identified a bladder tumor in 74% of cases, often associated with secondary lesions such as ureterohydronephrosis (52%) and prostatic hypertrophy (10%). Cystoscopy was the gold-standard diagnostic tool, allowing for macroscopic diagnosis and biopsy sampling and occasionally identifying associated lesions.

Thoraco-abdomino-pelvic CT (TAP-CT) scans showed metastases in 4 patients (three osseous, one hepatic).

Transurethral resection of the bladder (TURB) was performed in 64% of patients (n = 28). Radical surgery was performed in 7 patients (57% underwent cystoprostatectomy with Bricker diversion, and 43% had an anterior pelvic exenteration with Bricker diversion). Three patients with metastatic urothelial carcinoma were referred to for chemotherapy. Histological type was urothelial carcinoma in 74% (n = 14), squamous cell carcinoma in 21% (n = 4), and adenocarcinoma in 5% (n = 1).

The mean hospital stay was 8.7 days [1 to 30 days]. Outcomes were favorable in

59% (n = 26) of patients. Complications occurred in 32% (n = 14), primarily anemia and abdominal pain. In-hospital mortality was 9% (n = 4).

Renal Cancer: Renal cancer was the third most common urological cancer in our study. The mean age was 57.7 years, with the age group 70 - 80 years being the most represented. Hypertension was present in 57% (n = 4) of cases.

The most common symptom was lumbar pain (40%, n = 8), followed by hematuria (30%, n = 6). Physical examination revealed lumbar pain associated with a palpable mass in 55% of patients. Ultrasound identified the renal tumor in all cases, with a right-sided location in 54.5% (n = 6). Abdominal CT scans showed pulmonary metastases in two patients.

Extended total nephrectomy (ETN), involving removal of the kidney, perirenal fat, and Gerota's fascia, was performed in 81% (n = 9) of patients. Three patients received systemic therapy with sunitinib.

The mean hospital stay was 10 days [3 to 18 days]. Evolution was favorable in 64% (n = 7) of patients. Complications occurred in 27% (n = 3), including electrolyte imbalance and altered consciousness. In-hospital mortality was 9% (n = 1).

Testicular Cancer: Testicular cancer was the fourth most common urological cancer in our study. The mean age was 45.3 years. No patients reported medical or surgical history, nor known risk factors such as testicular ectopia, cryptorchidism, or testicular atrophy.

Most patients consulted for chronic scrotal swelling, while two others presented with physical fatigue and anorexia. Physical examination revealed a firm, unilateral testicular mass in 4 cases and a painless mass in 75% of patients.

Before treatment, tumor markers (β -hCG and alpha-fetoprotein) were measured in one patient and were normal. Scrotal ultrasound was performed in 5 patients, confirming the testicular mass. Abdomino-pelvic CT scans were conducted in 2 cases, and TAP-CT scans in 4 cases.

High inguinal orchidectomy was performed in all cases; no patient underwent retroperitoneal or inguinal lymph node dissection. One infant, aged 2 years, presented with embryonal rhabdomyosarcoma of the right testis and required adjuvant chemotherapy.

The mean hospital stay was 8 days [2 to 22 days]. Evolution was favorable in all patients, with no in-hospital mortality.

4. Discussion

The unavailability of certain complementary examinations in patient records or within regional hospitals, as well as the lack of financial means or cooperation from some patients during follow-up, were the main limitations of this study.

Prostate cancer was the most frequent, followed by bladder cancer. In a 2011 study conducted in Benin by Ouattara A. *et al.* [3], the overall frequency of urogenital cancers was 17.38%; these were prostate cancers (69%), bladder cancers (28.5%), and kidney cancers (8.5%). In our study, the mean age of patients was 66 years. In 2014, Diallo I. *et al.* [4], reported a mean age of 54 years. Urological can-

cers are rare before the age of 50 in both sexes, with a male predominance. This difference in distribution may be explained by anatomical differences and varying levels of exposure to carcinogenic factors.

The average time between the onset of symptoms and consultation was three months in our study. In a 2019 Australian study, 60.7% of patients sought consultation after more than three months [5].

Hospital mortality in our study was low. Ouattara A. *et al.* [3], reported a mortality rate of 22.15%.

Poor access to medical information, the cost of follow-up and treatment, combined with low levels of health coverage, represent significant barriers to adequate patient monitoring. After an average follow-up of 10 months, more than one-quarter of patients were alive, one-eighth had died, and more than half were lost to follow-up. Diallo I. *et al.* [4], reported a specific mortality of 24.3%, a survival rate of 49%, and a loss-to-follow-up rate of 26% after an average follow-up of 28 months. This result clearly shows the need for psychotherapy for cancer patients and the strengthening of health policy in developing countries in general, with the widespread introduction of health insurance. From a general point of view, the exclusion of outpatients is linked to the lack of data concerning them, but it underestimates the prevalence of cancers and certain serious forms due to their advanced stages.

Prostate Cancer: In our study, prostate cancer ranked first among urological cancers. This incidence was also found in Benin, where it represented 69% of urological cancer hospitalizations [3]. It is a major public health issue in Africa. Its incidence is high in the United States, Finland, and France [6]. Prostate tumors typically affect older men, and nearly all patients in our study were over 50 years of age. Niang L. *et al.* [7], found an average age of 65 years (range 43 to 96). The advanced age of our patients could be explained by the lack of screening programs that could enable earlier diagnosis. It is therefore essential to raise public awareness in this regard.

Patients most frequently presented with symptoms such as dysuria and pollakiuria. Niang L. *et al.* [7], also found dysuria and pollakiuria in 14.7% and 17.65% of cases, respectively. In the study by Amégbor *et al.* [8], lower urinary tract symptoms were reported in 96.6% of cases. Extra-urinary symptoms in our study were mainly bone pain. Amégbor *et al.* [8], reported lumbar pain in 2% of cases. This can be explained by the fact that prostate cancer frequently gives rise to bone metastases.

Digital rectal examination (DRE) and serum total PSA were performed in all our patients. In the study by Niang L. *et al.* [7], PSA levels were elevated in 100% of cases, with a mean of 1447.57 ng/mL (range 5.88 to 21,660 ng/mL). PSA levels tend to increase as the disease progresses.

The high PSA level in our study, with an average of 1846 ng/mL, reflects the advanced stage of prostate cancer at the time of diagnosis in our patients. This delay is linked to several factors such as poverty, reliance on traditional medicine, and access to care.

Ultrasound helped to suggest the diagnosis in nearly all patients. CT scan was the most commonly used imaging modality for assessing locoregional extension. MRI is recommended for both confirming localized disease and assessing distant spread, especially bone metastases, where it has largely replaced bone scintigraphy. Heenan SD *et al.* [9], reported that MRI offered the most accurate evaluation for staging prostate cancer. In our context, MRI remains inaccessible for most patients due to its high cost and limited availability in the region.

Prostate adenocarcinoma was the only histological type identified in our study, and no subtypes were specified. Diallo I. *et al.* [4], also identified only adenocarcinoma. At the time of diagnosis, cancer was localized or locally advanced in less than half of our patients. In the study by Niang L. *et al.* [7], pelvic CT scan revealed a prostate mass with locoregional invasion in all cases. Bone metastases, predominantly in the thoracolumbar spine, were more frequent in our study, followed by pulmonary lesions. These secondary locations have also been reported by other authors [10] [11].

The main therapeutic modality in our study was bilateral orchiectomy, alone or combined with surgical or endoscopic urinary tract decompression (CPA or TURP). The study by Byar DP *et al.* [12], demonstrated the clinical efficacy of surgical castration, showing it was more effective in reducing pain and improving general condition in advanced-stage patients. It is preferred in our setting due to its lower cost, rapid action (lowering testosterone levels), feasibility under local anesthesia, and resulting symptomatic improvement, especially regarding pain. However, some patients declined hormone therapy due to concerns about side effects, particularly decreased libido and erectile dysfunction.

Radical prostatectomy, one of the reference treatments for localized prostate cancer in patients with a life expectancy of at least 10 years, was rarely performed in our study. Despite the proven expertise of the surgical team, the rarity of this radical surgery can be explained by the difficulty in selecting eligible patients, who are seen at an advanced stage on the one hand, and on the other hand, by patients' refusal after being informed of the possible complications following surgery, particularly erectile dysfunction and urinary incontinence.

In-hospital mortality was low in our study. This reduction in mortality may be attributed to recent efforts to improve the management of prostate cancer and its complications.

Bladder Cancer: In our study, bladder cancer ranked second after prostate cancer. The same trend is found in African literature, with the highest incidences reported in the Maghreb and West African countries [2] [13]. Adults were the most affected, with a predominance in males. Diao B *et al.* [2], reported an average age of 45.5 years with a ratio of 1.2. This cancer predominantly affects men, with a male-to-female ratio of 5:10, and it remains the most common urological cancer in women [3]. This may be explained in Africa by men's increased exposure to risk factors such as urinary schistosomiasis, tobacco use, and industrial carcinogens.

Macroscopic hematuria was the main reason for consultation among our patients. In a Senegalese series, the most frequent symptoms reported were irritative voiding disorders (94.5%) and hematuria (88%) [2]. It is well established that hematuria is the primary presenting sign of urinary tract tumors, particularly bladder cancer. The palpation of a hypogastric mass is considered a poor prognostic indicator and reflects advanced disease. This sign was found in one-quarter of patients in our study. It reflects the diversity of clinical symptoms and the often silent progression that may delay diagnosis. In the absence of urinary tract infection, these symptoms should raise suspicion of at least a bladder carcinoma.

Abdominal ultrasonography was performed in nearly all patients and revealed bladder tumors in three-quarters of the cases. Associated anomalies included ureterohydronephrosis and prostate hypertrophy. Ultrasound remains a useful investigation for identifying bladder tumors and visualizing the upper urinary tract and surrounding organs; however, it has limitations in detecting tumors smaller than 1 cm. Cystoscopy combined with biopsy provided histological confirmation in 100% of cases. The diagnosis of bladder tumors relies mainly on endoscopic examination, which determines the number, size, topography, and appearance of the tumor and the bladder mucosa [14]. CT scan of the chest, abdomen, and pelvis (CT-CAP) was performed in more than half of our patients. Despite its high cost, CT-CAP remains the reference tool for staging and follow-up of bladder cancer.

In our study, urothelial carcinoma was the most common histological type, followed by squamous cell carcinoma. Diao B *et al.* [2] found squamous cell carcinoma in 50.7% of cases, urothelial carcinoma in 42%, and adenocarcinoma in 3.9%. This may be explained by tobacco use and schistosomiasis infection.

In our setting, patients often sought care after prolonged symptomatic treatments and sometimes after using herbal remedies. These practices can be attributed to their lower cost, the absence or remoteness of specialized care, and diagnostic uncertainty with other urogenital conditions (e.g. bacterial infections, urinary schistosomiasis). Transurethral resection of bladder tumors (TURBT) was the most common procedure and was sufficient for Ta, Tis, and T1 tumors, as well as for palliative decompression. TURBT has the advantage of preserving bladder function, although the recurrence rate is high. Total cystectomy with urinary diversion (radical cystoprostatectomy + Bricker or anterior pelvic exenteration + Bricker) was also performed in some patients, allowing total tumor removal and lymph node dissection. In Burkina Faso, Lougue-Sorgho LC *et al.* [15], reported nine cases of total cystectomy associated with urinary diversion. Due to technical limitations, three patients in our study were referred to for chemotherapy. The outcomes were favorable in more than half of our patients, although complications occurred in more than one-quarter, and hospital mortality was low. In another series, immediate postoperative complications included an intra-abdominal collection on day 6 and a death on day 7 [16].

Kidney Cancer: In our study, kidney cancer ranked third after prostate and bladder cancer. This is a rare cancer, with an incidence of 2% worldwide [17].

Young adults were the most affected group. In Benin, the average age of patients with kidney cancer was 53.21 ± 15.55 years [3]. Although the incidence peaks in older adults, it is not uncommon in younger individuals. In our study, there was a predominance of female patients. In contrast, in Benin, kidney cancer was more frequent in men than in women, with a ratio of 3:11 [3].

The most common symptoms were lumbar pain and hematuria. Harir N *et al.* [18], found that hematuria was the presenting symptom in 45.21% of cases. On clinical examination, lumbar pain associated with a palpable mass was found in more than half of our patients. This clinical profile was also observed in a Senegalese study [17]. It is known that in kidney cancer, pain generally indicates compression of adjacent nerves or the migration of a blood clot into the ureter, reflecting advanced disease.

Ultrasonography was performed in all patients and revealed renal tumors, with a slightly higher frequency on the right side. Routine use of ultrasound has not modified the clinical profile of this cancer. In Western countries, kidney cancer is often detected incidentally due to improved imaging techniques that detect small tumors at an early stage. CT-CAP is the first-line examination for staging kidney cancer. It revealed pulmonary metastases in our study. Pulmonary or hepatic metastases are asymptomatic in 90% of cases, underscoring the importance of staging [19]. In contrast, bone or cerebral metastases are usually symptomatic or associated with poor general health [20]. MRI was used in selected cases. This examination is recommended for patients with renal insufficiency or with contraindications to iodinated contrast agents and is particularly useful for evaluating cystic tumors and small lesions not clearly characterized by other imaging techniques [21].

Radical nephrectomy with early ligation of the renal pedicle was the standard surgical procedure in our practice. Over time, adrenalectomy and lymph node dissection have been limited to tumors in the upper renal pole, the presence of venous thrombus, or large tumor size [22]. It is known that lymph node dissection does not improve survival in kidney cancer, but allows for more precise staging [20]. Systemic immunotherapy was used during follow-up in some of our patients.

The average hospital stay was 10 days. Arroua F *et al.* [23], reported an average stay of 8.1 days. In our study, the outcomes were favorable in nearly half of patients, complications occurred in one-quarter, and hospital mortality was low. Ouattara A *et al.* [3], reported a hospital mortality of 28.6%.

Testicular Cancer: Testicular cancer accounts for 1 to 1.5% of male cancers [24]. It ranked fourth among urological cancers in our study. Young adults were the most affected. In the literature, testicular cancer is considered rare among Africans; however, the risk increases significantly in cases of undescended testis [25].

Testicular swelling was the main symptom leading patients to seek medical care, and examination revealed a hard testicular mass. In the study by Kane R. *et al.* [26], these signs were the reason for consultation in 10 cases. This may be explained by the fact that testicular swelling is an alarming sign in men. Before treat-

ment, beta-HCG and alpha-fetoprotein levels were measured in one patient and found to be normal. Kane R *et al.* [26], reported elevated tumor markers in 11 patients before treatment. Scrotal ultrasound, when performed, confirmed the presence of a solid mass in our patients. It is a non-invasive, sensitive, and easy-to-use examination, but with limited specificity in our setting due to operator dependence. For staging, abdominopelvic CT was supplemented by thoracic CT or chest X-ray, confirming localized cancer in nearly all patients.

Embryonal rhabdomyosarcoma of the right testis was diagnosed in a two-year-old infant. Genitourinary localization accounts for about 20% of cases [27].

Orchidectomy was performed in all patients, followed by adjuvant chemotherapy in the case of embryonal rhabdomyosarcoma. This approach was justified by the localized nature of the disease. The average hospital stay was one week. The outcomes were favorable for all patients. Ouattara A *et al.* [3] reported a hospital mortality of 33.3%.

Difficulties and limitations: the retrospective nature of our study with data losses, the unavailability of certain additional tests in hospitals in the region, the lack of resources or cooperation of certain patients during follow-up, and the exclusion of patients followed on an outpatient basis.

5. Conclusion

Urogenital cancers are relatively common in routine urological practice. The use of clinical and paraclinical investigations, sometimes invasive, is always necessary to establish a definitive diagnosis. However, data on their prevalence and mortality remain scarce due to the lack of cancer registries in most African countries, including Senegal.

Conflicts of Interest

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

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