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ORIGINAL PAPER

Penile cancer in Burkina Faso: Epidemiology and difficulties of management about 21 cases

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Summary *Objective: To present our experience in the management of penile cancer (PC) in the context of a country with limited resources.*
Materials and methods: This was a cross-sectional study with retrospective data collection and descriptive aim. It was conducted over a 20-year period from 1 January 2005 to 31 December 2024.
Results: The frequency was 1.05 cases per year. The mean age of the patients was 60.23 ± 13.10 years. A proportion of 76.19% (n = 16) of patients were uncircumcised. One patient was HIV positive. Ulceration of the penis was the main reason for consultation (88.23%). The average time to consultation was 11.7 ± 11.37 months. Phimosis was observed in 2 patients. The histological type found was squamous cell carcinoma in all cases. Stage cT3 was the most common (71.42%), followed by stage cT4 in 28.58%. Twelve patients underwent surgical treatment. Total penectomy was performed in 5 patients, partial penectomy in 6 patients and emasculation in one patient. Node dissection was performed in 3 patients. One-year survival rate was 83.33%.
Conclusions: Penile cancer is rare and consultations are made at advanced stages. Awareness of the population on risk factors remains essential for early diagnosis and prevention.

KEY WORDS: *Penile cancer; Epidemiology; Squamous cell carcinoma; Penectomy.*

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INTRODUCTION

Urological cancers are becoming increasingly frequent and include a series of malignant tumors affecting the urinary tract and specifically the male genital system (1). Among these urological cancers, penile cancer is the least frequent worldwide. It ranks last among urological cancers both globally and in Burkina Faso. Few patients consult early due to the location of this cancer in the genital sphere (2). Yet, it is a very serious pathology due to its psychological impact and its often poor prognosis (3). It is therefore important to take stock of these cancers over more than a decade to better understand their epidemiology. Thus, our study aims to examine the epidemiological aspects and therapeutic challenges of penile cancers as observed at the *Sourô Sanou University Hospital Center* (CHUSS) in Bobo-Dioulasso.

PATIENTS AND METHODS

This was a cross-sectional study with retrospective data collection and a descriptive aim, conducted over a 20-year period from January 1, 2005, to December 31, 2024. Our study included all patients who presented with penile cancer and were managed in the department during the study period. Variables related to epidemiological, diagnostic, and therapeutic aspects were studied.
Statistical analysis of the collected data was performed using Epi Info software version 7, Word, and Excel 2016.

RESULTS

A total of 8213 cases of urological cancers were recorded over 16 years. Among these urological cancers, 21 cases of penile cancer were collected, representing a frequency of 0.25%. The hospital frequency was calculated at 1.05 cases per year.
The mean age of the patients was 60.23 years ± 13.10 years. The range was from 38 years to 88 years. The most represented age groups were (40-50 years) and (60-70 years) as indicated in Figure 1.

Figure 1.
Distribution of patients by age group.

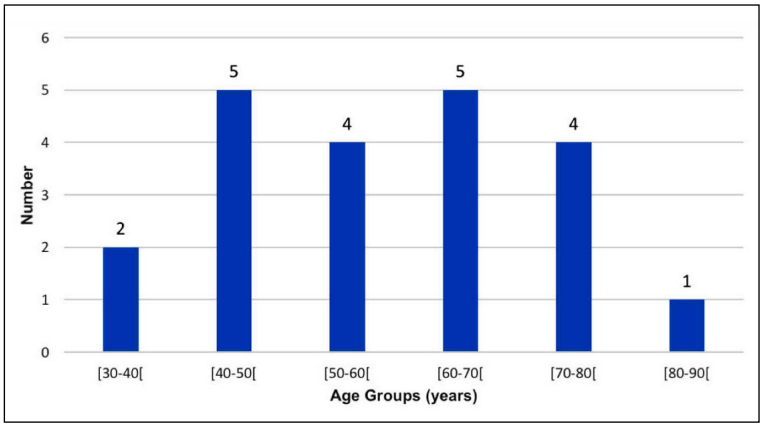

Table 1.
Distribution of patients by reason for consultation.

Reason for consultation	Number (n)	Percentage (%)
Penile Nodule	1	4.76
Penile Swelling	2	9.52
Ulceronecrotic Lesions of Penis	11	52.38
Exophytic/Budding Lesions of Penis	7	33.33
Total	21	100

The majority of our patients were unschooled (71.42%). Among the schooled patients (28.58%), the education level was dominated by primary school (17.64%) followed by secondary school and literacy in equal proportions (10.94%). All patients were farmers and had a low socioeconomic status (100%).
Seventeen (17) patients, a proportion of 80.95%, came from a rural environment, compared to 4 patients (19.05%) who were from an urban environment.
Sixteen patients (76.19%) were uncircumcised, compared to 23.81% who had undergone circumcision. Medically, one case of diabetes and one case of positive HIV serology were found. A history of smoking was found in 9 patients (42.85%), and a history of alcoholism in 12 patients (57.14%).
Erosive lesions of the penis were the most frequent reason for consultation in 88.23% of cases, followed by penile nodule and penile swelling in equal proportions as presented in Table I.
The mean time to consultation was 11.7 months ± 11.37 months, with a range from 1 month to 48 months.
Ulcerations were found in 18 patients (85.71%). These ulcerations were exophytic/budding in 7 patients and necrotic in 11 patients (Figure 2).
A nodule and penile swelling were found in equal proportions. Furthermore, phimosis was noted in 2 patients (Figure 3).
The glans was involved in 13 patients (76.47%). The lesion extended to the penile shaft in 2 patients. In 2 other patients, the lesion involved the entire penis and scrotum.
Lymphadenopathy was found in 10 patients (47.61%). All these lymph nodes were inguinal. They were hard and fixed in 4 patients (19.04%), firm and mobile in the others. They were all painless. The mean diameter was 2.62 cm with a range from 2 cm to 5 cm. One patient presented with a pathological fracture of the right femur (bone metastasis).

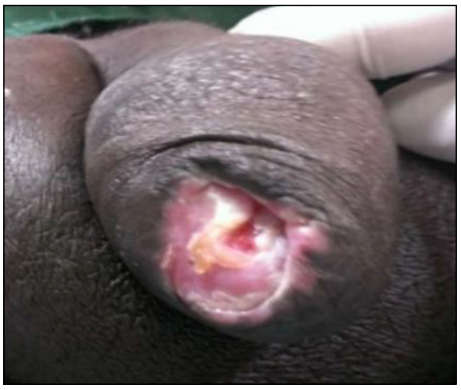

Figure 3.
Penile tumor located in the balanopreputial area with non-tight phimosis.

Eight patients underwent abdominopelvic ultrasound and 4 underwent ultrasound of the corpora cavernosa. Seven patients had a chest X-ray and 5 patients had an abdominopelvic CT scan. The breakdown of ancillary investigations performed is provided in Table 2.

Table 2.
Paraclinical examinations performed by the patients.

Type	Nature	Number (n)	Percentage (%)
Morphological exams	Ultrasound of Corpora Cavernosa	4	19.04
Locoregional Staging	Abdominopelvic Ultrasound	8	38.09
Distant Staging	Chest X-ray	7	33.33
	Abdominopelvic CT Scan	5	23.80

Among the four patients who underwent ultrasound of the corpora cavernosa, three had significant infiltration of the corpora cavernosa and one had thickening of the corpora cavernosa. All ultrasounds and X-rays were normal. The CT scan performed showed small subclinical inguinal and pelvic lymph nodes in two patients.
Biopsy associated with histopathological examination, performed in 12 patients (a proportion of 57.14%), found squamous cell carcinoma as the histological type in all cases (Figure 4).

Figure 2.
Necrotic ulceration involving the entire penis with an inguinal crater in a patient seen at M21 after diagnosis who refused penectomy.

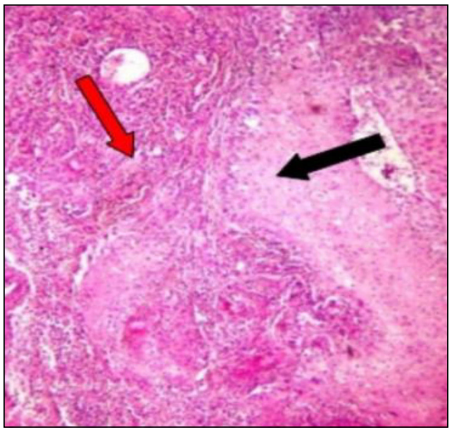

Figure 4.
Histological appearance of a mature differentiated squamous cell carcinoma. Disorganized proliferation of polygonal cells arranged in lobules (solid black arrow) with a necrotic area (solid red arrow).

Table 3.
Distribution of patients by nodal status.

Nodal Status	Number (n)	Percentage (%)
cN0	7	33.33
cN1	1	4.77
cN2	5	23.8
cN3	3	14.3
Not evaluated	5	23.8
Total	21	100

Stage cT3 was the most represented with a proportion of 15 cases (71.42%), followed by stage cT4 in 6 cases (28.57%). The nodal status is presented in Table 3. One patient (4.76%) had bone metastasis.
Counseling was provided to all patients. Surgical treatment was indicated for all patients. Among the 21 patients, twelve agreed to surgical treatment versus nine refusals. Among the 12 patients who agreed to surgical treatment:

- 5 patients underwent total penectomy, among whom lymph node dissection was performed in 2 patients.
- 6 patients underwent partial penectomy (Figure 5 and 6), among whom lymph node dissection was performed in one patient.
- 1 emasculation was performed on one patient.

During follow-up, 5 of the patients were lost to follow-up as they did not attend postoperative consultations and were unreachable by phone. Two deaths occurred at 6 months and 8 months after partial penile amputation.

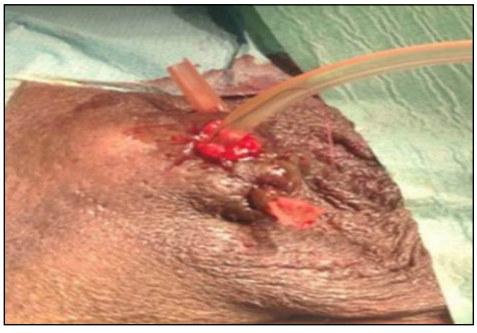

Figure 5.
Post-operative appearance after partial penectomy.

Figure 6.
Surgical specimen from a partial penectomy (7 cm) for an ulcero-exophytic lesion with a cauliflower-like appearance confined to the glans.

Figure 7.
Partial penectomy with lymph node dissection, well-healed, in a patient seen 5 years postoperatively.

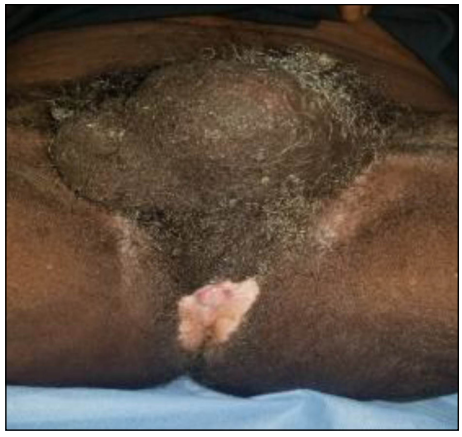

Figure 8.
Total penectomy with perineal urethrostomy in a patient with M2 disease.

Thus, for the operated patients, the 1-year survival rate was 83.33%. Figures 7 and 8 depict the post-operative outcomes after partial and total penectomy, respectively.
Regarding the non-operated patients, out of the 9 non-operated patients, 2 were followed for 1 year, the other 7 were lost to follow-up.

Discussion

Penile cancer is a rare cancer in Burkina Faso; its frequency was 1.05 cases per year in our series. The overall incidence of penile cancer is approximately 1/100,000 men in Europe and the United States, 2/100,000 men in Scandinavia, and is reported to be 8.3% in Brazil (4). This incidence is lower among Hebrews. In 1907, *Burney et al.* reported 100 cases of penile cancer in Israel, among which there were no Hebrews (5). In Africa; *Ouattara et al.* (6) reported no cases of penile cancer over 4 years in Benin. *Sow et al.* (7) in Senegal report a frequency of 0.72 cases per year. Developing countries have a higher incidence.
Penile cancer is a cancer of elderly men (8). Its incidence increases with age, peaking during the sixth decade (5). Rare before 55 years, these tumors mainly affect those over 75 years (4). The mean age in our series was 60.23 years. *Chaux et al.* (9) in Paraguay, *Opara et al.* (10) in Congo-Brazzaville, *Nouri et al.* (11) in Morocco, and *Rimtebaye et al.* (12) in Chad reported mean ages of 62 years, 60.35 years, 60.5 years, and 60 years respectively, close to ours. Indeed, the natural history of penile cancer is difficult to establish, as lesions progress for a long time before the first consultation (8).

Low socioeconomic status is recognized as a risk factor for penile cancer (4). In the series by *Chaux et al.* (9), 75% of patients lived in poverty, and in that of *Sow et al.* (7) like ours, all patients had a low socioeconomic status. Consequently, patients faced financial difficulties for performing paraclinical examinations on one hand, and for their medical and surgical management on the other.

In our series, 76.19% of patients were uncircumcised. This figure corroborates the protective role of circumcision in the occurrence of this pathology. According to *Persky et al.* (13), the lowest rates of penile cancer appear in groups practicing infant circumcision. The absence of circumcision leads to an accumulation of smegma, which has an implicated carcinogenic potential in the occurrence of penile cancer (9,14). This assertion is confirmed by *Licklider et al.* (5) who report a low rate of penile cancer in the Jewish population where circumcision is performed on the 8th day after birth. In the Democratic Republic of Congo, *Longombe and Lusi* (15) reported 5 cases of penile cancer all from the same ethnic group where circumcision is not a routine practice.

Furthermore, one patient was HIV positive. Indeed, it is recognized in the literature that HIV infection accelerates the progression of penile cancer (16).

Consultations most often occur late. The mean time to consultation was 11.7 months ± 11.37 months. *Opara et al.* (10) in Congo-Brazzaville and *Sow et al.* (7) in Senegal reported mean delays of 18 months and 23.4 months, respectively. In our context, the delay in consultation could be related, on one hand, to the location of the tumor in the genital sphere, considered a taboo subject by the population, and on the other hand, to the initial recourse to traditional medicine.

In our study, a wound and/or ulceration of the penis was the most frequent reason for consultation (n=18, 85.71%). The same was true in the series by *Opara et al.* (10) and *Nouri et al.* (11). Since consultations most often occur at an advanced stage of the disease, patients are seen with macroscopically visible lesions. This ulceration preferentially affects the foreskin and/or glans. In our study, the glans was involved in 13 patients, a proportion of 76.47%. In the study by *Favorito et al.* (17) in Brazil, the tumor was located on the glans and prepuce in 73.14% of cases. In that of *Opara et al.* (10) in Congo-Brazzaville, the glans was involved in 84.61% of cases. These data confirm the literature stating that penile cancer develops on the glans and/or prepuce in more than 60% of cases (18).

In our series, lymphadenopathy was present in almost half of the patients (47.61%). The risk of nodal extension depends on the stage of the primary tumor. The average risk of lymph node metastases is 59% in cases of invasive penile tumor (14). The histological type was squamous cell carcinoma in all 12 patients. All studies conducted by authors in Africa have made the same observation (2, 7, 8, 10).

Counseling was provided to all our patients. Surgical treatment was indicated for all patients. The surgical treatment of penile cancer is based on partial or total penile amputation with or without bilateral ilioinguinal lymph node dissection (8). Among the 21 patients, slightly less than half (42.85%) refused the proposed treatment. Similar results were reported by *Gueye et al.* (8) in Senegal. Indeed, in their series, only three out of eleven patients accepted penile amputation. This mutilating surgery is poorly accepted and often refused by patients for psychological or even religious considerations (8). Among the 12 patients who agreed to surgical treatment, partial or total penile amputation and one emasculation were performed. Lymph node dissection was performed in 25% of cases. No patient received chemotherapy or radiotherapy. The goals of treating the primary tumor remain complete removal of the tumor with as much organ preservation as possible, without compromising oncological control (4). In Senegal, penectomy was indicated for all patients in the series by *Sow et al.* (7). In that of *Nouri et al.* (11), penectomy was performed in 5 out of 6 patients, the last was at a metastatic stage and received Chemotherapy. We can say that the delay in consultation, the insufficiency of technical facilities, and the context of poverty are the reasons for the inadequacies noted in the management of penile cancers and the recourse to surgical treatment in Burkina Faso. Two operated patients died within one year post-intervention. In France, Daubisse-*Marliac et al.* (19) reported a net survival of patients with penile cancer of 85%, 65%, and 59% at 1, 5, and 10 years, respectively. *Sow et al.* (7) estimate the overall 5-year survival of operated patients at 83% in Senegal.

In our context, follow-up was very difficult due to the high number of patients lost to follow-up. Indeed, 7 of the non-operated patients and 5 of the operated patients were lost to follow-up. The survival of operated patients was estimated at 83.33% at 1 year.

Declarations

Ethical approval and consent for participate: *The study was conducted in compliance with the Declaration of Helsinki's principles on human rights and ethical standards in research. The research protocol was validated and accepted by the local ethic committee of department of Surgery (Souro Sanou University Teaching Hospital), which granted us authorization for the study under the number No 002/2025. Given the retrospective nature of the study, the requirement for individual patient consent was waived.*

Consent for publication: *Written informed consent was obtained from the patients whose images were used in this article.*

Availability of data and material: *All data generated or analyzed during this study are included in this published article.*

Competing interests: *The authors declare that there are no conflicts of interest regarding the publication of this article*

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Authors' contributions: *AKP, DY and AS: Conceptualization, Investigation, Resources, Validation, Writing – original draft, Writing – review & editing; CAMKDY, BK, MS, AB, HS: Resources, Validation, Writing – original draft, Writing – review & editing; AO and FAK: Supervision, Writing – original draft, Writing – review & editing. All authors read and approved the final manuscript.*

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Conclusions

Penile cancer is rare in Burkina Faso. It is a cancer that mainly affects elderly subjects. This rarity could be explained by the widespread practice of circumcision in Burkina Faso. Surgical treatment remains the most used therapeutic option, as radiotherapy is not available in our context. Also, accessibility to chemotherapy remains limited. Thus, the majority of patients refuse surgical treatment, which is mutilating and a source of serious psychological repercussions with feelings of loss of self-esteem and altered body image.

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