

Clinical and Histopathological Profile of Penile Carcinoma: A Case Series

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ABSTRACT

Background: Penile carcinoma is a rare malignancy, predominantly represented by squamous cell carcinoma (SCC). It commonly affects older men and may present with locally advanced disease. This study aimed to evaluate the clinical and histopathological characteristics of penile carcinoma cases in a tertiary care hospital. **Materials and Methods:** A retrospective observational case series was conducted at an oncosurgery hospital in Buldhana, Maharashtra, over four years. Seven patients whose surgically resected specimens were confirmed as carcinoma penis histopathologically were included. Clinical, operative and histopathological details were obtained from medical records and pathology reports using a predesigned proforma. **Results:** The patients were aged 35–84 years, with a mean age of 62.4 years. All seven cases were squamous cell carcinoma, and the glans was involved in all cases. Lesions were predominantly ulcerative or fungating, with symptom duration ranging from 3 to 5 months. Five cases (71.4%) were moderately differentiated, one was well differentiated and one was poorly differentiated. Tumor depth ranged from 3 to 30 mm. Extensive local invasion involving the corpus spongiosum, corpus cavernosum and urethra was observed in two cases. **Conclusion:** The present series demonstrates the clinical and histopathological spectrum of penile SCC, with predominant glans involvement and moderate differentiation. Early diagnosis and comprehensive histopathological assessment are important for accurate staging and management. Larger studies with adequate follow-up are warranted.

Keywords: Carcinoma; Histopathology; Penile neoplasms; Squamous cell carcinoma; Staging; Tumor invasion

INTRODUCTION

Penile carcinoma is a rare but potentially aggressive malignancy that originates mainly from the squamous epithelium of the glans, prepuce, or penile shaft [1]. Incidence and prevalence distribution and reporting are extremely variable worldwide. Because of the rarity of the tumor, there are insufficient data to define a clear pathogenesis, and it is thought to occur either as a malignant change of penile intraepithelial neoplasia (PeIN) or de novo, possibly because of one or more risk factors [2].

It is the 30th most common cancer worldwide with 36068 cases [3]. Countries like South America, Africa and India have recorded the highest figures. In 2020, Asia accounted for 20315 cases, representing 56.3% of the total. India had the highest incidence rate in Asia, at 1.6 cases per 100,000.³ Over 95% of the diagnosed cancers of the penis are of the squamous cell

carcinoma type, and most of them are of Grade 1 and 2 [4]. Penile cancer is seen frequently in men from low socio-economic groups who have poor hygiene. The most important risk factors for penile cancer with a considerable influence on its incidence are human papillomavirus (HPV16-18) infection, phimosis and smoking. Penile cancer is a disease that generally occurs in later life with the highest incidence in the > 60-year age group [5]. It is a rare malignancy, but when diagnosed, it is psychologically devastating to the patient and can be a challenge to clinicians [6]. Penile cancers usually present as small, painless lesions, nodules, lumps or ulcers on the glans penis or prepuce. It can look very different. They may present as white-gray exophytic masses that protrude from the penile skin or as flat, red, or ulcerated lesions [7,8]. Histopathological examination is the key factor in diagnosis and management of penile carcinoma. Histopathological examination not only confirms

malignancy but also provides important information regarding the histological subtype, the degree of differentiation, the depth of invasion, and metastasis. These parameters are important for staging and management [9,10].

Carcinoma of the penis, though clinically important, is relatively under-reported with limited clinicopathological data from individual tertiary care centres in India. Systematic assessment of the clinical presentation and histopathological spectrum of these cases can help in identifying common patterns, associated risk factors and pathological features associated with advanced disease. Therefore, the present study is undertaken to evaluate the clinical and histopathological characteristics of penile carcinoma cases in a tertiary care hospital.

MATERIALS AND METHODS

The present study was designed as a retrospective observational case series to study the clinical and histopathological characteristics of patients diagnosed with carcinoma penis. The study was conducted at an oncosurgery hospital in Buldhana, Maharashtra. The study included all 7 patients who underwent surgical treatment for clinically suspected carcinoma penis during the study period of 4 years and whose surgically resected specimens were subsequently submitted for histopathological examination and confirmed as carcinoma.

Details of the surgical procedure and specimen were obtained from the operative records and pathology requisition forms. Clinical and histopathological details were collected using a predesigned proforma, which included age, residence, presenting complaints, duration of symptoms, risk factors, site and number of lesions, gross appearance, palpable inguinal lymph nodes, tumor size, histological type and grade, depth of invasion, other histopathological characteristics, and TNM staging. Each case was described individually with its relevant clinical and histopathological findings, and the cases were subsequently summarized in a tabular format.

CASE DETAILS

Case 1:

A 47-year-old rural male presented with an ulcer and penile growth of 3 months' duration. He had a history of diabetes mellitus. On clinical examination, a single ulcerative lesion measuring $5 \times 4.5 \times 2.5$ cm was noted involving the glans and prepuce. Palpable inguinal lymph nodes were present. Histopathological examination revealed moderately differentiated squamous cell carcinoma (Grade 2), with a depth of invasion of 8 mm and involvement of the corpus spongiosum. The tumor was staged as T3N0Mx.

Case 2:

A 78-year-old rural male presented with penile growth for 4 months. A single fungating lesion measuring 4

cm was present over the glans, with palpable inguinal lymph nodes. Histopathology showed well-differentiated squamous cell carcinoma (Grade 1), with a depth of invasion of 30 mm. There was involvement of the lamina propria, corpus spongiosum, corpus cavernosum and urethra, along with tumor necrosis. The recorded TNM stage was T3N0Mx.

Case 3:

A 63-year-old urban male presented with an ulcer over the penis for 3.5 months. A single ulcerative lesion measuring 2.6 cm was located over the glans, with palpable inguinal lymph nodes. Histopathological examination revealed moderately differentiated squamous cell carcinoma (Grade 2), with a depth of invasion of 3 mm and involvement of the lamina propria. The recorded stage was T1aN0MX.

Case 4:

A 63-year-old rural male presented with an ulcer over the glans for 3 months. A single ulcerative lesion measuring 5 cm in its largest dimension was noted, with palpable inguinal lymph nodes. HIV status was recorded as a risk-factor variable. Histopathology demonstrated moderately differentiated squamous cell carcinoma (Grade 2), with a depth of invasion of 13 mm. The tumor involved the lamina propria, corpus spongiosum and corpus cavernosum. The recorded TNM stage was T2N0Mx.

Case 5:

A 67-year-old rural male presented with an ulcer of 4 months' duration. A single ulcerative lesion measuring $4 \times 4 \times 3$ cm was present over the glans, with palpable inguinal lymph nodes. Histopathology showed moderately differentiated squamous cell carcinoma (Grade 2), with a depth of invasion of 30 mm. There was involvement of the lamina propria, corpus spongiosum, corpus cavernosum and urethra, with associated tumor necrosis. The recorded stage was T3N2.

Case 6:

An 84-year-old rural male presented with penile growth for 5 months and had a history of tobacco chewing. Two fungating lesions were noted over the glans, with a tumor size of $3 \times 2 \times 1$ cm. (Figure 1) Palpable inguinal lymph nodes were absent. Histopathology revealed moderately differentiated squamous cell carcinoma (Grade 2), with a depth of invasion of 3 mm and involvement of the lamina propria. The recorded stage was T2.(Figure 2)

Case 7:

A 35-year-old rural male presented with penile growth of 4.5 months' duration. A single fungating lesion measuring $2 \times 2 \times 0.5$ cm was present over the glans, with palpable inguinal lymph nodes. Histopathological examination revealed poorly differentiated squamous

cell carcinoma (Grade 3), with a depth of invasion of 3 mm and involvement of the lamina propria. The

recorded TNM stage was T1aN2Mx.



Figure 1: Partial penectomy specimen with multiple superficial warty growths

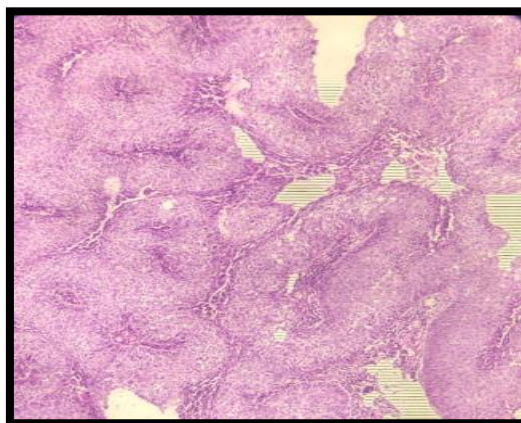


Figure 2: Moderately differentiated squamous cell carcinoma – (H&E, 100x)

Table 1: Clinical characteristics of penile carcinoma cases

Case	Age (years)	Residence	Presenting complaints	Symptom duration (months)	Risk factors	Site of lesion	No. of lesions	Gross appearance	Palpable inguinal lymph nodes	Tumor size (cms)
1	47	Rural	Ulcer, penile growth	3.0	Diabetes mellitus	Glans, prepuce	1	Ulcerative	Yes	5 × 4.5 × 2.5
2	78	Rural	Penile growth	4.0	Not reported	Glans	1	Fungating	Yes	4
3	63	Urban	Ulcer	3.5	Not reported	Glans	1	Ulcerative	Yes	2.6
4	63	Rural	Ulcer	3.0	HIV status reported	Glans	1	Ulcerative	Yes	5

5	67	Rural	Ulcer	4.0	Not reported	Glans	1	Ulcerative	Yes	$4 \times 4 \times 3$
6	84	Rural	Penile growth	5.0	Tobacco chewing	Glans	2	Fungating	No	$3 \times 2 \times 1$
7	35	Rural	Penile growth	4.5	Not reported	Glans	1	Fungating	Yes	$2 \times 2 \times 0.5$

Table 2: Histopathological characteristics of penile carcinoma cases

Case	Histological type	Histological grade	Depth of invasion (mm)	Other histopathological characteristics	TNM staging
1	Squamous cell carcinoma	Moderately differentiated (Grade 2)	8	Corpus spongiosum involvement	T3N0Mx
2	Squamous cell carcinoma	Well differentiated (Grade 1)	30	Lamina propria, corpus spongiosum, corpus cavernosum and urethral involvement; tumor necrosis	T3N0Mx
3	Squamous cell carcinoma	Moderately differentiated (Grade 2)	3	Lamina propria involvement	T1aN0MX
4	Squamous cell carcinoma	Moderately differentiated (Grade 2)	13	Lamina propria, corpus spongiosum and corpus cavernosum involvement	T2N0Mx
5	Squamous cell carcinoma	Moderately differentiated (Grade 2)	30	Lamina propria, corpus spongiosum, corpus cavernosum and urethral involvement; tumor necrosis	T3N2
6	Squamous cell carcinoma	Moderately differentiated (Grade 2)	3	Lamina propria involvement	T2N0Mx
7	Squamous cell carcinoma	Poorly differentiated (Grade 3)	3	Lamina propria involvement	T1aN2Mx

DISCUSSION

Penile carcinoma, though a rare disease worldwide, continues to be an important health problem in the developing countries including India. The present series of seven patients illustrates the characteristic clinical and histopathological spectrum of penile carcinoma with prevalence of older age, glans involvement, ulcerative or fungating lesions and moderate histological differentiation.

Ages ranged from 35 to 84 years (mean 62.4 years) and six patients were older than 45 years. This is in line with the Indian experience reported by Kamat et al. They studied 150 patients at Tata Memorial

Hospital and found that most of the patients were in the fourth to seventh decades [11].

All 7 cases were of Squamous Cell Carcinoma (SCC) and the glans was involved in all seven cases, with additional preputial involvement in one case. This is consistent with published data that SCC and the glans are the most common histology and location of cancers of the penis [12]. Lesions in the present series were mostly ulcerative or fungating, ranging in size from 2 to 5 cm, with symptom duration of 3–5 months, indicating presentation after clinically evident local disease.

Documentation of risk factors showed diabetes mellitus, tobacco chewing and HIV status in 1 case each. Tobacco exposure is commonly reported in Indian cohorts of penile cancer. In the recent Indian series, 80% of patients with a documented smoking history reported tobacco use [13].

Five cases (71.4%) were moderately differentiated, one well differentiated and one poorly differentiated. The grade distribution differs across studies. In a recent Indian study by Kaushik V et al., the predominant tumor grade was Grade 1 whereas Khurshid F et al. reported maximum cases of Grade 2 indicating histological heterogeneity of penile SCC across populations.^{13,14}

Tumor depth ranged widely from 3 to 30 mm. The two cases with the most extensive invasion (30 mm) showed extensive involvement of the corpus spongiosum, corpus cavernosum and urethra, associated with tumor necrosis. Conversely, three cases showed only 3 mm invasion with limited involvement of the lamina propria. This finding is clinically relevant since increased depth and anatomical extension are associated with higher nodal risk. Dai et al, in a study of 72 patients, identified a significantly greater mean depth of invasion in patients with lymph-node metastasis than in node-negative patients (9.3 vs. 3.2 mm; $p < 0.001$), and nodal metastasis was more frequent in pT2/pT3 than pT1 tumors [15]. Moreover, Sali et al. reported that tumor grade, anatomical level of invasion and infiltration pattern were important predictors of nodal metastasis in penile SCC [16].

Overall, the present series reflects the known spectrum of penile SCC, with its predilection for the glans, occurrence in older men, predominance of conventional moderately differentiated SCC and its potential for deep local invasion. The broad spectrum of invasion depth in the cases further emphasizes the need for thorough histopathological assessment for risk stratification and management.

Limitations

The present study has several limitations. First, the small sample size of seven cases limits the generalizability of the findings. Second, the retrospective study design relied on the availability and completeness of medical records and histopathological reports. Detailed information regarding risk factors, including human papillomavirus infection, smoking, and other relevant exposures, was not consistently documented. Additionally, complete information regarding lymphovascular invasion, perineural invasion, lymph node evaluation, and metastatic status was not available for all cases. The absence of adequate long-term follow-up data also limited the assessment of treatment outcomes, recurrence, and survival. Therefore, the findings should be interpreted cautiously, and larger prospective or multicentre studies are warranted.

CONCLUSION

We present a series of cases illustrating the varied clinical and histopathological presentations of squamous cell carcinoma of the penis with a predominance of glans involvement and moderately differentiated tumors. Among the cases, there was considerable variation in tumor depth, local invasion and nodal status.

These results highlight the need for early diagnosis and detailed histopathological analysis for accurate staging and treatment. Larger studies with adequate follow-up will be necessary for further assessment of prognostic factors and outcomes.

DECLARATIONS

Ethical Approval: Ethical approval details were not provided in the available study information. The authors should specify the Institutional Ethics Committee approval number and date or the applicable exemption, as appropriate.

Informed Consent: Details regarding informed consent or an ethics committee-approved waiver for the use of retrospective patient data were not provided. The authors should clarify this according to institutional requirements.

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