



Hello, Is It SCC You Are Looking for? Squamous Cell Carcinoma of the Penis Presenting as an Inguinal Mass

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Clinical Practice Points

- Penile cancer is usually diagnosed clinically; however, the penile examination is often omitted in routine clinical practice.
- The results from the presented case highlight that complete examination of the penis, although often omitted during an initial assessment, with a resultant delay in diagnosis and management, should be incorporated into the examination.
- A full penile examination with foreskin retraction should be performed in all presentations of inguinal lumps or lymphadenopathy.
- Metabolic imaging (fluorine-18 fluorodeoxyglucose positron emission tomography) is a useful adjunct in the evaluation of metastatic groin nodal masses to delineate the primary etiology of potentially malignant lymphadenopathy if the primary neoplastic lesion has not been identified using other methods.
- Ensuring routine penile examination for all men presenting with an inguinal lump could prevent the delayed diagnosis of penile cancer.

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Case Report

A 77-year-old man presented to the general surgical outpatient clinic with a 4-month history of an irreducible lump in the right groin. He had no significant medical history and was a known smoker. Ultrasound examination revealed a 3.4 × 2.1-cm hypoechoic lymph nodal mass and smaller adjacent nodes, with features indicative of malignant disease (Figure 1). A subsequent contrast-enhanced computed tomography (CT) scan confirmed a conglomerate 5 × 4-cm enhancing mass with central low density in

the right groin, consistent with necrotic inguinal lymphadenopathy (Figure 2). No intra-abdominopelvic pathologic features were seen on either the ultrasound or CT scans. Fine needle aspiration cytology identified squamous cell carcinoma. A search for a primary tumor source began with a “top to toe” clinical examination, which revealed no specific abnormality. Investigations to exclude upper gastrointestinal and anal malignancy also proved negative, revealing only incidental *Helicobacter pylori*-associated gastritis and low-grade tubular adenomas, respectively. A decision was undertaken to proceed to metabolic imaging with fluorine-18 fluorodeoxyglucose (FDG) positron emission tomography (PET). The FDG-PET scan demonstrated significant tracer uptake in the region of the right groin mass and also at the tip of the penile urethra, suggesting a possible malignant source related to the penis (Figure 3). The patient underwent another clinical examination. On retraction of the foreskin, an ulcerated lesion was found on the ventral aspect of the foreskin. On closer questioning, the patient had not seen the lesion previously and reported a 1-year history of difficulty retracting the foreskin. Histopathologic examination after an uncomplicated circumcision confirmed squamous cell carcinoma (SCC), and the patient subsequently underwent successful lymph node dissection.

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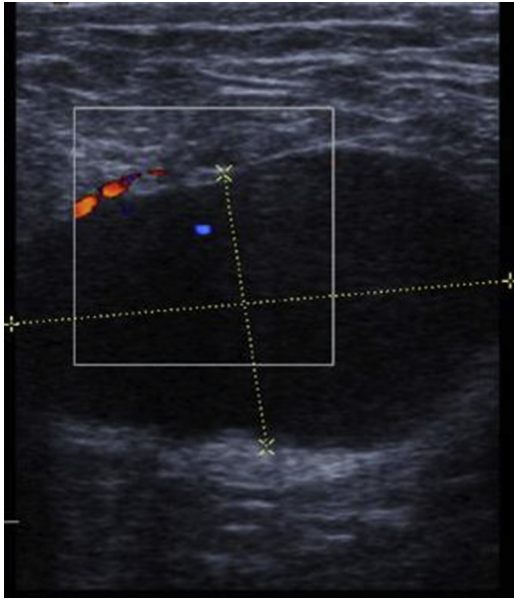
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Penile SCC Presenting as an Inguinal Mass

Figure 1 Ultrasound Image Revealing a Hypoechoic Right Groin Lymph Nodal Mass With No Hilar Flow and Mild Peripheral Flow on Doppler Interrogation. The Ultrasound Features Were Highly Suggestive of a Necrotic Metastatic Nodal Mass



Discussion

SCC of the penis is a rare malignancy in developed nations but has a greater incidence in the developing world. In the United States, incidence rates have been reported at around 1250 cases annually.¹ In developing nations, the reported rates have been as great as 10% to 20%, with the greatest incidence seen in Uganda and Brazil.² In contrast, the lowest incidence rates have been seen in Israeli Jews.³ It is most commonly diagnosed in older men, especially those aged 50 to 70 years.⁴ Several risk factors exist for SCC,

including smoking, low socioeconomic status, and human papillomavirus. (HPV). The most important risk factor for penile cancer is the presence of an intact foreskin. In the United States, this has conferred a threefold increase in the risk of developing penile cancer.⁵ As expected, the incidence of penile cancer has been comparatively low in communities performing routine circumcision at birth.⁶ Furthermore, the prevalence of HPV has been greater in men who have not been circumcised.⁷ Circumcision has been found to be protective against penile cancer but only if performed during the neonatal period.⁸ Another important risk factor is the presence of phimosis, which is thought to cause chronic inflammation, leading to metaplastic changes and, ultimately, malignancy. Any chronic inflammatory condition (eg, balanoposthitis and lichen sclerosus et atrophicus/balanitis xerotica obliterans) is thought to be causative.

Penile cancer is associated with delays in presentation, mainly owing to the social stigma associated with the condition and the potential for it to be hidden from view because of phimosis. Typically, it presents in the form of a lesion on the penis, with or without inguinal lymphadenopathy. The lesion can take the form of a nodule, ulcer, or erythematous lesion.⁹ Other complaints include pain, bleeding, and a foul-smelling discharge.¹⁰ The condition can also be diagnosed because of constitutional symptoms of weight loss and malaise.

The diagnosis of SCC of the penis depends primarily on a careful clinical examination to identify a lesion that can be biopsied. Approximately two thirds of patients will present with a localized lesion on the penis, most commonly on the glans, shaft, or prepuce.¹¹ The guidelines have suggested that a punch, incisional, or excisional biopsy are all feasible options for achieving a histologic diagnosis. Penile cancer has a lymphogenic pattern of metastasis, with the first drainage station in the inguinal region. The presence or absence of nodal involvement is important for determining the treatment strategy.

Studies have suggested that a careful clinical examination is superior to both ultrasonography and magnetic resonance imaging (MRI).¹² A number of imaging modalities can assist in the diagnosis and planning subsequent management. Ultrasonography and MRI can be useful in men with large tumors to identify the tumor's relationship to the surrounding structures.¹³ The detection of lymph node involvement is also important for staging, treatment, and prognosis. Both ultrasonography and CT can identify malignant lymph nodes; however, ultrasonography has limited sensitivity and specificity.¹⁴ In contrast, the identification of affected nodes on CT is determined only by size criteria, a suboptimal marker of the disease.¹⁵ MRI has increasingly been used, because it also allows for the assessment of the functional aspects of the lymph nodes.¹⁶ Another imaging option is PET/CT, which allows for functional and morphologic evaluation of the lymph nodes. However, it offers only approximately 20% sensitivity¹⁷ and is therefore limited in improving nodal staging accuracy in the early diagnostic period.¹⁸ Staging of penile SCC is essential for guiding management and is based on the American Joint Committee on Cancer TNM classification¹⁹ (Table 1).

The main goal of management is complete cancer eradication; however, organ preservation also remains a high priority owing to the potential functional and psychosocial complications associated

Figure 2 Selected Computed Tomography Axial Image Confirming Confluent Right Inguinal Lymphadenopathy (White Arrow) With Evidence of Necrosis, Typical of Metastatic Nodal Disease

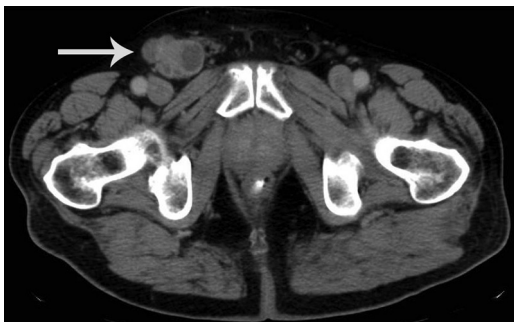
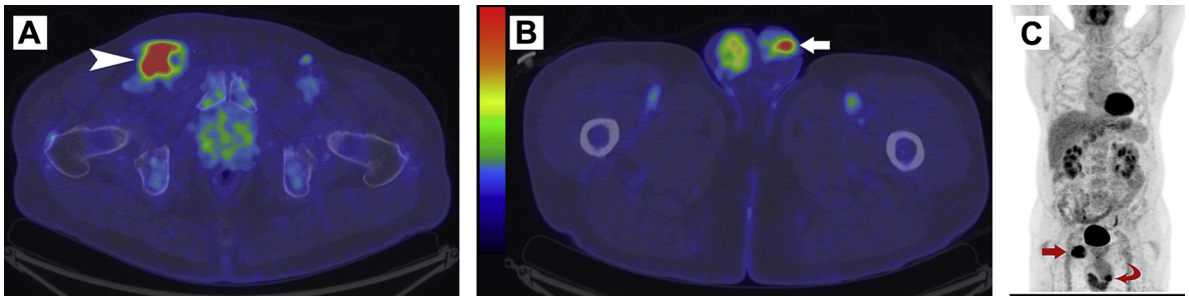


Figure 3 (A) Axial Fused Fluorine-18 Fluorodeoxyglucose (FDG) Positron Emission Tomography/Computed Tomography (PET/CT) Image Demonstrating a Markedly FDG-avid Right Inguinal Nodal Mass (White Arrowhead). (B) Axial Fused FDG-PET/CT Image Identifying a Focus of FDG Avidity at the Penile Tip (White Arrow). (C) Coronal PET Maximum Intensity Projection Image Demonstrating FDG-avid Right Inguinal Lymphadenopathy (Red Arrow) and FDG-avid Focus at the Penile Tip (Primary Cancer; Red Arrowhead)



with treatment. Various therapeutic options exist for superficial penile cancer. Topical treatment with 5-fluorouracil can be applied to the lesion for 4 to 6 weeks, although evidence is limited to support its role in management.²⁰⁻²² Circumcision remains the treatment of choice for lesions that affect the foreskin only. However, recurrence rates as great as 50% have been reported with circumcision alone.²³ Another option is laser therapy, which is generally well tolerated by patients; however, it also has a high overall recurrence rate.²⁴⁻²⁷ Mohs micrographic surgery is a minimally invasive option that involves removing successive thin slices of tissue and examination under microscopy to confirm removal of the lesion. This technique has the advantage of producing good

cosmetic results, with low recurrence rates at 5 years in centers with a dermatologist trained in Mohs surgery.^{28,29} Furthermore, most recurrences will be amenable to further local therapy.^{30,31}

The mainstay of managing invasive penile SCC remains surgical, with glans removal or penectomy. However, radiation therapy can be an effective organ-sparing primary treatment in certain cases, particularly in smaller lesions.^{32,33} The rate of penile preservation has been reported to be as great as 80% but with failure rates greater than those after surgery.³⁴ Deeply invasive penile cancers are commonly managed with radical penectomy and perineal urethrostomy to ensure eradication of all disease. Organ preservation is not possible in these cases, because the likelihood of incomplete resection is high. Neoadjuvant chemotherapy can be used to downstage the tumor before resection. A poor response to chemotherapy would suggest aggressive disease and that palliative radiotherapy and/or chemotherapy should be considered.³⁵

The management of lymph node involvement in penile SCC has been more controversial. The European Association of Urologists has recommended that for impalpable lymph nodes, sentinel lymph node biopsy should be undertaken. If positive, a complete (superficial and deep) inguinal lymph node dissection should be performed and, if negative, observation can be recommended. In patients with palpable nodes, sentinel node biopsy should not be advised, and such patients should undergo fine needle aspiration of the palpable nodes. If positive, superficial and deep inguinal lymph node dissection should be performed on the ipsilateral side.^{18,36} In the United States, however, superficial lymphadenectomy is commonly performed in patients with high-grade T1 disease (or higher) with impalpable nodes. For patients with palpable lymph nodes, antibiotics can be given to reduce the risk of infection, with bilateral inguinal lymph node dissection undertaken at a later stage.³⁷

The EUA has recommended rigorous follow-up protocol for the first 2 years, with a less-intensive follow-up protocol for 5 years. Physical examination remains the most important tool for detecting recurrence; however, ultrasonography and PET/CT are gaining importance, particularly in conjunction with the physical examination.³⁸⁻⁴⁰

Table 1 2009 American Joint Committee on Cancer TNM Clinical Classification of Penile Cancer¹⁹

Stage	Description
Tumor (T)	
TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Tis	Carcinoma in situ
T1	Tumor invades subepithelial connective tissue
T2	Tumor invades corpus spongiosum or cavernosum
T3	Tumor invades urethra or prostate
T4	Tumor invades other adjacent structures
Node (N)	
NX	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Metastasis in a single, superficial, inguinal lymph node
N2	Metastasis in multiple or bilateral superficial inguinal lymph nodes
N3	Metastasis in deep inguinal or pelvis lymph nodes, unilateral or bilateral
Metastasis (M)	
MX	Distant metastasis cannot be assessed
M0	No evidence of distant metastasis
M1	Distant metastasis

Penile SCC Presenting as an Inguinal Mass

In our case, the patient had a delayed presentation because of phimosis, which had masked the causative lesion on the foreskin. The difficulty in retracting the foreskin was a relatively new symptom and, as mentioned previously, is a well-documented independent risk factor for the development of SCC of the penis. Despite its low sensitivity in some studies, PET/CT was invaluable in identifying the primary lesion in relation to the penis, which prompted further clinical examination. The ulcerated lesion only became apparent with retraction of the penile foreskin. Complete examination of the penis will often be omitted from the clinical examination, potentially leading to missed cancerous lesions and significant delays in the diagnosis and management. The results from the present patient highlight the importance of examining the penis completely, with emphasis on retracting the foreskin, which we suggest should be performed in all presentations of an inguinal lump or lymphadenopathy.

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