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CASE REPORT

Cutaneous Penile Metastases from Prostate Adenocarcinoma: A Rare Case Report

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Abstract

Introduction: While prostate cancer is the most common malignancy in men, cutaneous penile metastases are rare and indicate a poor prognosis.

Case Presentation: A 63-year-old man with painful non-healing penile lesions was referred to our unit for workup. Clinical examination revealed indurated ulcerative lesions with bilateral inguinal lymphadenopathy. Incisional biopsy of the penile lesions confirmed metastatic adenocarcinoma with NKX3.1 positivity, indicating prostatic origin. Further workup showed a blood serum PSA level of 489 ng/mL; prostate biopsy confirmed Gleason Grade 8 prostate cancer, and bone metastases were seen on plain skeletal radiography. A bilateral orchidectomy was performed, and he was started on docetaxel chemotherapy and zoledronic acid.

Conclusion: The multidisciplinary management of this case resulted in regression of the metastatic lesions at his six-month follow-up, with no new cutaneous lesions observed.

Keynote message: Cutaneous penile metastases from prostate adenocarcinoma are a rare manifestation of advanced disease and are linked with a poor prognosis. This case highlights the importance of careful clinical evaluation of persistent penile lesions, as early recognition and multidisciplinary management are essential for oncological treatment and symptom control.

Introduction

Prostate cancer (PCa) is the commonest malignancy in men and a leading cause of cancer-related mortality worldwide [1]. It typically metastasizes to the bones, lymph nodes, liver, and lungs. Penile metastases from PCa are an exceedingly rare occurrence

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of secondary involvement, with an incidence of less than 0.5%, often signifying advanced disease and a poor prognosis. Owing to their nonspecific appearance, these lesions often mimic benign inflammatory or infectious penile conditions, causing delayed diagnosis and treatment [2,3]. We report a rare case of cutaneous penile metastases secondary to prostate adenocarcinoma and discuss the clinical implications.

Case Presentation

A 63-year-old male was referred to our urology unit with an eight-month history of painful, non-healing penile lesions that responded poorly to antimicrobial therapy. On further history, he reported no Lower Urinary Tract Symptoms (LUTS), urethral discharge, gross hematuria, or any constitutional symptoms. He had no comorbidities, history of Sexually Transmitted Infections (STIs), or family history of genitourinary malignancies.

Clinical examination revealed multiple indurated ulcerative lesions, measuring 2cm x 3cm in diameter, involving the penile glans and external urethral meatus (Figure 1). Hard bilateral inguinal lymph nodes were palpable, and no urethral discharge was noted. The scrotum was uninvolved, and normal testes were palpable bilaterally. Abdominal and neurological examination were unremarkable. An incisional biopsy of the penile lesions was performed, and microscopic examination demonstrated dermal infiltration by a malignant gland-forming epithelial neoplasm composed of irregular glands, poorly formed acinar structures, and tumour cells with enlarged, hyperchromatic nuclei and moderate eosinophilic cytoplasm. Histopathology revealed ulcerated skin infiltrated and undermined by an invasive moderately differentiated adenocarcinoma with MNKX3.1-positive immunohistochemical staining, supporting a prostatic origin for the cutaneous penile metastatic deposits. Based on this result, a prostate cancer workup was initiated. Digital rectal examination revealed a hard, irregular prostate consistent with a clinical T4 lesion with markedly elevated serum Prostate-Specific Antigen (PSA) levels of 489 ng/mL. A skeletal survey via plain radiography showed extensive sclerotic bony lesions involving the vertebral column and pelvic bones, consistent with spinal bone metastases (Figure 2), despite the patient being asymptomatic. A transrectal ultrasound-guided prostate biopsy confirmed the diagnosis of invasive adenocarcinoma

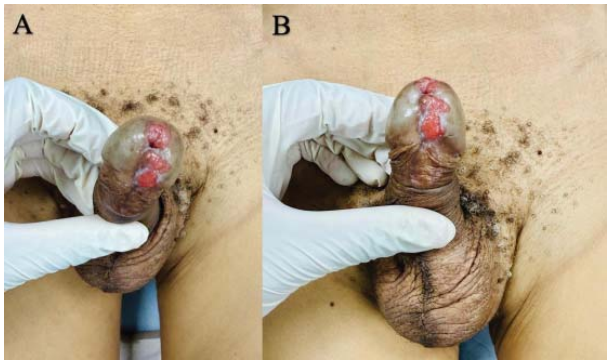

Figure 1 Superior (A) and anterior frontal (B) views of the penis in the supine position show multiple irregular, exophytic, erythematous ulcerative nodules on the dorsal aspect of the glans penis extending into the external urethral meatus.

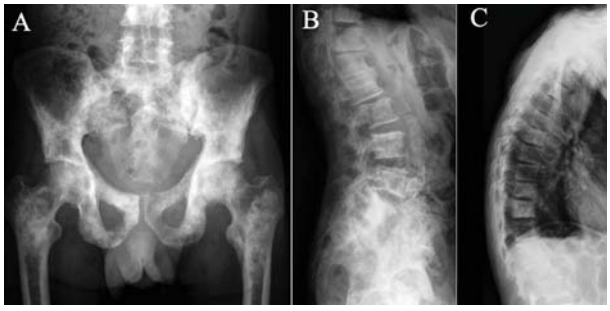

Figure 2 Anteroposterior pelvic (A) and lateral lumbar spinal (B) view radiographs demonstrating diffuse osteoblastic metastases involving the ilium, sacrum, pubic rami, proximal femur, L1-L5 vertebrae, and the sacrum. The bone trabeculae are obliterated by patchy, sclerotic areas, resulting in a "mottled ivory pelvis" appearance. The lateral thoracolumbar radiograph (C) shows multilevel sclerotic vertebral lesions extending from the mid-thoracic region to the lumbar vertebrae.

of the prostate, Gleason Grade 8 (4+4), with no evidence of perineural or lymphovascular invasion. A multidisciplinary (MDT) meeting ensued, and the patient decided to undergo a bilateral orchidectomy, with consensus to proceed with surgical castration. Following the orchidectomy, he was referred to our oncology unit, where docetaxel chemotherapy and zoledronic acid were initiated. At his most recent follow-up visit, six months later, the penile metastatic lesions regressed, pain improved, partial epithelial healing occurred, and no new cutaneous lesions were noted.

Discussion

Penile metastases from prostate cancer carries a poor prognosis, with a mean survival reported at less than one year after diagnosis [4]. It can present with nodules, ulceration, penile pain, induration, priapism, hematuria, obstructive or irritative urinary symptoms [2]. Unlike the typical metastatic pattern of prostate cancer, which is predominantly skeletal and nodal [5], penile metastases represent an atypical cutaneous manifestation that often leads to diagnostic delay [6].

We present a rare case of a metastatic adenocarcinoma of the prostate presenting as cutaneous lesions of the penile glans and shaft. This phenomenon is believed to result from systemic venolymphatic dissemination, either *via* retrograde venous spread through the valveless pelvic venous plexus or via lymphatic spread through pelvic and inguinal lymphatics [7]. In our case, the presence of bilateral inguinal lymphadenopathy and skeletal metastases supports a systemic venolymphatic route of spread, consistent with mechanisms described in prior case reports [2,4,8]. Furthermore, the diagnostic challenge was highlighted by a longstanding history of painful penile lesions initially attributed to primary penile pathology. This is echoed in the literature describing misdiagnosed penile lesions as Peyronie's disease, balanitis, Sexually Transmitted Diseases (STIs), or primary penile carcinoma [4]. Definitive diagnosis was achieved through an incisional penile biopsy and immunohistochemical staining, underscoring the importance of histopathological confirmation when evaluating persistent penile lesions. In our patient, NKX3.1 immunohistochemistry demonstrated nuclear positivity, confirming prostate origin. NKX3.1 is a highly sensitive and specific marker for prostatic tissue, shown to be superior to serum PSA, especially in poorly differentiated metastatic adenocarcinoma [9]. The elevated serum PSA (489ng/mL) supported the diagnosis and reflected the burden of metastatic disease. A limitation of this case is that contrast-enhanced computed tomography (CT) and prostate-specific membrane antigen positron emission tomography/computed tomography (PSMA PET/CT) were not performed, as advanced imaging was unlikely to alter the initial management.

Most reported cases of penile metastases from prostate adenocarcinoma occur after an established diagnosis of prostate cancer, often during disease progression or biochemical relapse [2,4,10]. In contrast, the present case is notable as the cutaneous penile metastases were the presenting manifestation, preceding the diagnosis of prostate cancer. Similar presentations have been described, with authors reporting diagnostic delays prior to histological confirmation [4,7,8].

Although Androgen Deprivation Therapy (ADT) remains the backbone of treatment for metastatic prostate cancer, it is now combined with hormone therapies, taxane-based chemotherapy, or radiotherapy [11,12]. Given the advanced, hormone-sensitive nature of the disease [13], all management options were discussed with the patient. Considering his residence in a remote rural area and the anticipated challenges with long-term follow-up, a bilateral orchidectomy was performed as definitive androgen deprivation therapy. Surgical castration remains an effective, rapid,

and cost-efficient approach for reducing circulating testosterone and slowing disease progression [14-16].

This case illustrates the challenges associated with the delayed diagnosis due to atypical presentation and emphasizes the need for clinicians to maintain a broad differential diagnosis for persistent penile lesions in older men. Furthermore, if it were assumed that the lesions were a primary penile pathology based on their appearance, a crucial diagnosis might have been overlooked in a patient presenting with similar skin nodules but no other symptoms.

The significant psychological impact of penile metastases and bilateral orchidectomy, including effects on sexual function and body image, further emphasizes the importance of counseling and psychosocial support. Multidisciplinary care remains vital to ensure comprehensive treatment, symptom control, and psychological support [17,18].

Conclusion

Cutaneous penile metastases from prostate adenocarcinoma are a rare phenomenon, but a clinically significant manifestation of late-stage disease. Clinicians should maintain a high index of suspicion when evaluating persistent penile lesions, especially in patients with other systemic symptoms, and pursue prompt histopathological evaluation to avoid delayed diagnosis of an underlying malignancy.

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Author Contributions

Van Jaarsveld Navan: Writing – original draft; writing – review and editing; validation

Chimusoro Litha: Writing – original draft; writing – review and editing; validation

Ilett Chiara: Writing – original draft; writing – review and editing; validation

Jeff John: Supervision; writing – original draft; writing – review and editing; validation

Ethics Approval and Consent to Participate

Our institution does not require ethical approval for individual case reports.

Consent for Publication

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