



Diffuse Penile Metastasis from Prostate Carcinoma: A Rare Clinical Entity and MRI Diagnosis

ABSTRACT

Penile metastasis is typically linked to disseminated malignancy, leading to poor outcomes. We present an unusual case of penile metastasis from prostate cancer, diagnosed via Magnetic Resonance Imaging (MRI). Most metastatic tumors to the penis originate from genitourinary organs, followed by the recto-sigmoid region. Common clinical symptoms include penile pain, nodules, malignant priapism, skin lesions, and urinary disorders. While a diagnosis may be suspected based on history and a comprehensive physical examination, it necessitates confirmation through imaging, biopsy, and histopathologic examination. MRI serves as a valuable, non-invasive imaging technique, assisting in assessing the size, location, and extent of penile metastases, crucial for deciding between surgical or palliative treatment option.

Keywords: Magnetic resonance imaging, penile metastasis, prostate carcinoma

Penile metastasis is a relatively uncommon neoplasm. It typically presents as subclinical or clinically obvious metastatic nodules in patients with advanced-stage cancers. Although cases of penile metastasis have been reported as a rare entity, they exhibit various primary tumor patterns, locations, and clinical manifestations. Physical examination alone might be insufficient to assess the penile tumors and their extent for accurate management (1, 2). In this report, we aim to discuss and illustrate a case of penile metastasis, highlighting its clinical manifestations, imaging findings, and the contribution of Magnetic Resonance Imaging (MRI).

CASE REPORT

A 74-year-old man, under monitoring for metastatic prostate carcinoma for five years, presented to the urology department with penile pain and difficulty in urination. He had a history of a gradually enlarging penis and reddish skin lesions on the glans. His prostate-specific antigen (PSA) level was 52 ng/mL (normal range: 0.0–4.0 ng/mL). Given suspicions of metastases, a contrast-enhanced MRI was performed using a 3T MRI scanner (GE Healthcare, Milwaukee, WI) with intravenous gadolinium contrast (Dotarem, gadoterate meglumine; Guerbet, Aulnay-sous-bois, France). The MRI revealed multiple lesions in the bilateral corpus cavernosum extending to the corpus spongiosum and prostate. The lesions were hypointense on T1 weighted images, hyperintense on T2WI, showed restriction on diffusion images, and displayed prominent contrast enhancement post-contrast (Figure 1 a-c). A subsequent penile biopsy confirmed the diagnosis of metastases from prostate carcinoma.

DISCUSSION

Penile metastasis, despite the rich vascularization of the penis, remains a rare clinical entity. It frequently originates from genitourinary and pelvic organs, primarily the bladder and prostate (1). Common clinical manifestations include penile nodules, priapism, skin lesions, and urination disorders. Metastatic lesions typically appear as multiple infiltrative nodules. While physical examination has been a conventional evaluation method, knowing the tumor's size, number, location, and the presence of cavernosal or urethral infiltration is crucial for planning further treatment, even if it's palliative (1, 2). Ultrasound (US) is recommended as the initial modality for evaluating penile lesions, whether benign or malignant.

Esin Kurtuluş Öztürk 

Saffet Öztürk 

Department of Radiology, Ankara Etlik City Hospital, Ankara, Türkiye

Corresponding author:

Esin Kurtulus Ozturk

✉ e.kurtulus@hotmail.com

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Figure 1 a. T2 weighted sagittal image demonstrates iso-hyperintense mass-like multiple lesions located in bilateral corpus cavernosum with extension to corpus spongiosum, penis root and prostate.



Figure 1 c. Post-contrast fat suppressed T1 weighted sagittal image shows prominent heterogenous contrast enhancement of the lesions.

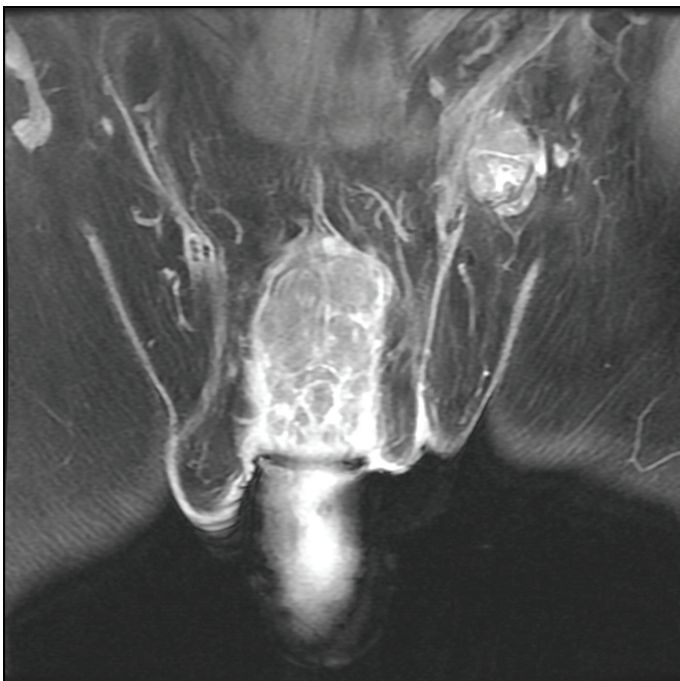


Figure 1 b. A coronal DWI demonstrates diffusion restriction in penile shaft and pathologic lymphadenopathy in the left inguinal region.

Due to its superior soft-tissue contrast and high spatial resolution, MRI is increasingly utilized for both problem-solving in patients who have already undergone physical examination and US and as a primary evaluation tool. MRI plays a crucial role in differentiating benign from malignant penile lesions, determining the extent and severity of penile injuries, infections, or inflammations, and provid-

ing a clear picture of the extent and locoregional staging of penile tumors (3). Furthermore, MRI findings can enhance current surgical practices and research. Diagnoses are typically made using biopsy or fine-needle aspiration to differentiate primary from secondary penile tumors. Recently, various systemic chemotherapy agents have been deployed to treat penile metastases, but no significant improvement in survival rates has been observed (1,3).

In conclusion, though rare, penile metastasis should be included in the differential diagnosis in older patients presenting with penile nodules and skin lesions, especially if they have a prior history of malignancy. MRI serves as a dependable, non-invasive imaging technique for assessing the extent of primary or secondary penile malignancies and any involvement of the tunica albuginea or urethra.

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