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Case Report

Patient with penile metastasis from prostate cancer and survival over 5 years: A case report with longitudinal evaluation using computed tomography and magnetic resonance imaging ☆

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ABSTRACT

Penile metastasis of malignant tumors is a very rare condition, often occurring as a part of systemic metastases, and is therefore associated with a poor prognosis. Although there have been reports of magnetic resonance imaging findings of penile metastasis, longitudinal imaging changes have not been presented previously. We report a case of a 80-year-old male patient with penile metastasis from prostate adenocarcinoma. First magnetic resonance imaging demonstrated multiple penile nodules in the left corpus cavernosum corpora cavernosa, and these nodules were fused and across the septum of the penis, forming an enlarged, diffusely spreading mass on the follow-up exam 5 years later. In this case, a longitudinal evaluation of magnetic resonance imaging demonstrated the course of the extension of the rare penile metastasis.

Introduction

Penile metastasis of malignant tumors is a rare condition with poor prognosis, with a mean survival time of 9 months [1] and the longest reported survival time of 30 months [2]. Although some authors have described magnetic resonance imaging (MRI) findings of penile metastasis [3,4], there have been no reports on longitudinal MRI examinations. We report a case of a patient with penile metastasis of prostate cancer, with

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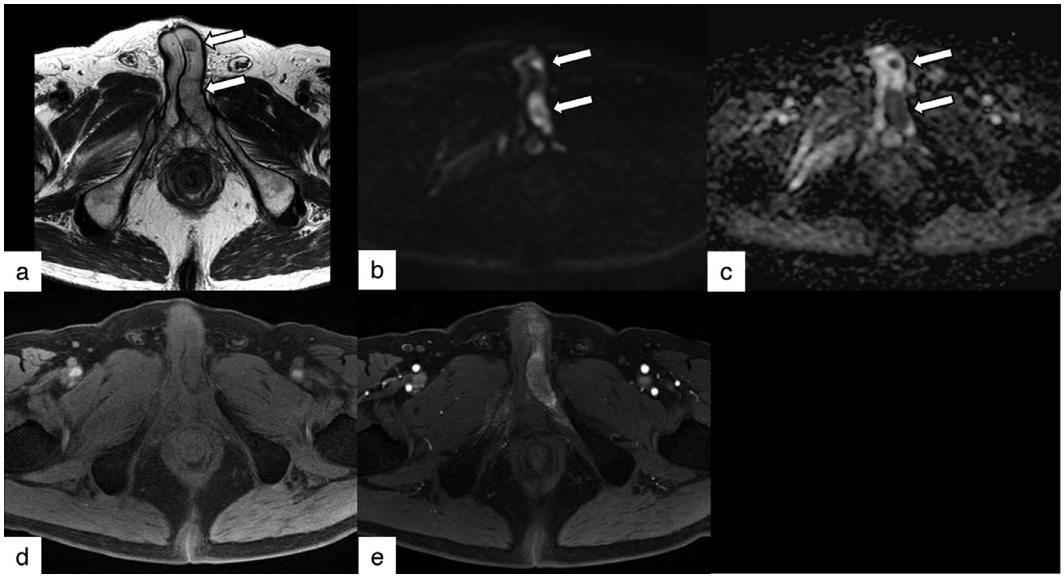

Fig. 1 – (A) Axial T2-weighted image; (B, C) Axial diffusion-weighted image (b = 1000 s/mm^2) and apparent diffusion coefficient map; (D, E) Axial pre and postenhanced T1-weighted fat-saturated image. Axial T2-weighted image showing 2 nodules with low intensity in the left corpus spongiosum (A). The nodules show high intensity on diffusion-weighted images with a low apparent diffusion coefficient (B, C). Contrast-enhanced T1-weighted fat-saturated image shows enhancement of the nodules (D, E).

survival of more than 5 years after the initial diagnosis and a review the MRI findings.

Case report

An 80-year-old man was referred from another hospital because of elevated prostate-specific antigen (PSA) levels (48 ng/mL; normal range ≤4 ng/mL). He had a medical history of diabetes and appendicitis. Transrectal needle biopsy of the prostate revealed adenocarcinoma with a Gleason score of 4 + 4. Pelvic MRI showed a tumor in the left lobe of the prostate, which had invaded the left seminal vesicle. Metastatic tumors in the right pubic bone and internal obturator muscle, as well as the left corpus cavernosum, were demonstrated (T3bN0M1) (Fig. 1). The patient received hormonal treatment combined with radiotherapy (66 Gy/33 fr) to the prostate, seminal vesicles, and right pubic bone. After 12 months of treatment, the PSA level decreased to 0.013 ng/mL. However, the PSA levels started to increase, and after changing the treatment regimen several times, the patient decided to change the treatment to one with the intent to maximize his quality of life without antineoplastic regimens 41 months later. Sixteen months later, he presented to the hospital with a complaint of perineal pain. The PSA level was elevated at 32.4 ng/mL. Palliative treatment for pain was selected, and a follow-up MRI was performed 14 months later to evaluate disease activity. Nodules had fused and enlarged, diffusely spreading to the left and right penile corpus cavernosum (Fig. 2). The patient received palliative radiation therapy (8 Gy/1 fr) for the pain induced by the penile metastasis. Since then, the condition of the patient has been maintained for 5 years and 2 months after the diagnosis of penile metastasis.

Discussion

We report a case of a patient with prostate cancer who survived for more than 5 years after the initial detection of penile metastasis with a longitudinal evaluation of MRI findings.

Penile metastasis is a very rare clinical entity and usually occurs in the setting of widespread metastatic disease elsewhere in the body [5]. Most lesions originate from genitourinary and pelvic organs, mainly the bladder, prostate, and rectosigmoid colon [6]. The median age reported for penile metastases from prostate cancer ranged from 65 to 75 years [7]. As in the present case, most patients have bony metastases when they present with penile metastases [4]. The most common clinical signs are penile pain, ulceration, painful or painless palpable penile nodules, priapism, urinary retention, dysuria, and hematuria [4,8]. The most accepted mechanisms of penile metastasis include arterial, venous, lymphatic metastasis, and direct invasion as other secondary malignancies. Among these routes, the metastatic lesions in the present case spread most likely via the venous route by retrograde flow, which converges on the dorsum of the penis [6].

The prognosis of penile metastasis is generally poor, with approximately 9 months of average survival [1]. There have been limited case reports of patients with penile metastases of malignant tumors who survive for more than 18 months. Zhang et al. [5] reported the case of 1 patient with urothelial cancer among 8 patients with various primary cancers who

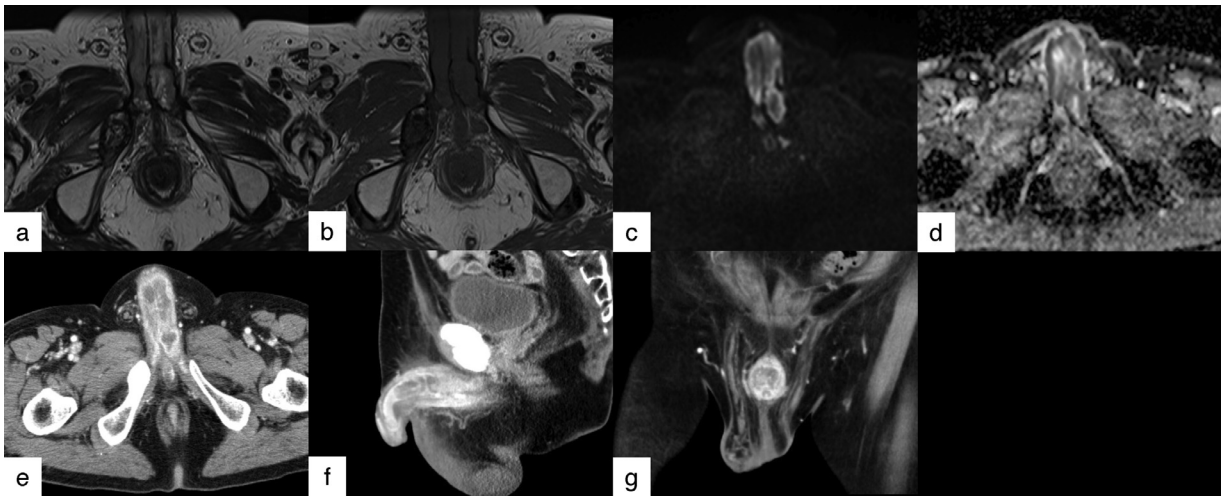

Fig. 2 – (A) Axial T2-weighted image; (B) Axial T1-weighted image; (C, D) Axial diffusion-weighted image (b = 1000 s/mm^2) and apparent diffusion coefficient map; (E) Axial contrast-enhanced CT; (F) Sagittal contrast-enhanced CT; (G) Coronal contrast-enhanced CT. Follow-up MRI acquired 5 years after the initial MR images demonstrate a mass diffusely spreading to the bilateral penile corpus cavernosum. The contrast-enhanced CT axial (E) and sagittal (F) images show the tumor with predominantly marginal contrast enhancement. The contrast-enhanced CT coronal image (G) shows that the tumor extends across the septum of the penis. CT, computed tomography; MRI, magnetic resonance.

survived for >18 months. Zhu et al. [9] reported that 2 of 8 patients with penile metastasis of bladder cancer survived for 22 and 23 months, respectively. Chaux et al. [10] indicated that 1 patient with penile metastasis of prostate cancer among 17 patients with various primary cancers survived for 18 months. The present case is unique in that the patient has survived for more than 5 years since the diagnosis of penile metastasis. To our knowledge, this is the longest survival duration that has been reported in the literature. One possible reason for longer survival in the present case is that the primary tumor responded well to the hormonal treatment combined with radiotherapy until serum PSA levels started to increase again. The absence of malignant priapism associated with penile metastasis might have contributed to the extended survival, as Cocci et al. [2] reported that patients with malignant priapism showed significantly worse prognosis than patients with penile metastasis without priapism.

The treatment of penile metastasis should be aimed at palliation and improving the quality of life. The treatment options include local excision of the tumor, radiation therapy, bilateral orchiectomy, additional hormonal and chemotherapy, and partial or total amputation of the penis [1,4,8,11]. In the present case, the patient received palliative radiation (8 Gy/1 fr) for the penile metastasis, which induced remission of pain.

Penile metastases typically manifest as multiple discrete masses in the corpora cavernosa and corpus spongiosum, as seen on the first MRI in the present case. The metastatic masses can be seen as low-intensity areas within the corporal bodies compared to the normal corporal tissue on both T1- and T2-weighted sequences. Contrast-enhanced CT shows a focal enhancing mass consistent with the present case [3]. To our knowledge, imaging findings on diffusion-weighted imaging (DWI) and apparent diffusion coefficient (ADC) maps are unknown. In the present case, the penile metastases showed high intensity on DWI with a low ADC. The second MRI demonstrated fused nodules across the septum of the penis, forming an enlarged, diffusely spreading mass to the left and right penile corpus cavernosum.

Conclusion

We present a case of penile metastasis in a patient with prostate cancer who has survived more than 5 years after the diagnosis of the penile metastasis. Follow-up MRI demonstrated tumor extension across the septum of the penis forming a diffusely enlarged penis.

Patient consent

Informed consent for patient information to be published in this article was obtained.

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