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Metastatic prostate carcinoma presenting as a gluteal soft tissue mass

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***Abstract*:** Metastatic lesions from prostate adenocarcinoma to the bone and lymph nodes and less frequently to the lungs, pleura, liver and adrenal glands are well documented. The presence of soft tissue metastases from a prostate adenocarcinoma is extremely rare. We report a case of a 56-year-old male who presented with a 2-year history of a painless buttock mass. MRI showed a well-defined, right gluteal intermuscular soft tissue mass and multifocal hypointense lesions of the pelvic bones and appendicular skeleton suggestive of secondary metastatic disease. Tru-cut biopsy of the gluteal mass demonstrated metastatic adenocarcinoma. Further workup showed an elevated prostate-specific antigen, and acinar adenocarcinoma of the prostate was confirmed on transrectal biopsy of the prostate. Androgen deprivation therapy with long-acting three monthly goserelin and short-term cover with bicalutamide was initiated as was systemic taxane-based chemotherapy. He has shown an excellent PSA response and remains asymptomatic with complete resolution of the size of the gluteal metastasis at the most recent follow-up 9 months later.

Keywords: adenocarcinoma, buttock, gluteal, metastases, prostate, sarcoma, soft tissue mass

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Introduction

Prostate cancer was the second most frequently diagnosed cancer and the fifth leading cause of cancer-related mortality among men in 2020.[1] While metastatic lesions to the bone and lymph nodes and less frequently to the lungs, pleura, liver and adrenal glands are well documented, the presence of soft tissue metastases from a prostate adenocarcinoma is extremely rare. We report a rare case of metastatic prostate adenocarcinoma (mPCa) presenting as a painless, gluteal soft tissue mass.

Case discussion

A 56-year-old African male with no known underlying health conditions initially presented to the surgical department with a 2-year history of a progressively enlarging but painless buttock mass. Clinical examination revealed a 15 × 10 cm soft, non-tender, mobile, outer upper quadrant mass of the right buttock. Magnetic resonance imaging (MRI) showed a 15.5 × 10.6 × 6.9 cm (CC × TV × AP) heterogeneous well-defined, right gluteal intermuscular soft tissue mass. The visualized pelvic bones and appendicular skeleton on MRI demonstrated low signal intensity on T1-weighted images with multifocal hypointense lesions suggestive of secondary metastatic disease (Figure 1). Widespread osteoblastic lesions were also identified on ^{99m}Tc methylene diphosphonate (MDP) bone scintigraphy (Figure 2). The differential diagnosis at this stage was either a primary soft tissue sarcoma with metastatic disease or an unknown primary elsewhere with soft tissue metastases. A Tru-cut biopsy of the gluteal mass showed core biopsies of subcutaneous tissue demonstrating metastatic adenocarcinoma (Figure 3). Fused glands and nests comprising relatively monotonous neoplastic cells were present, with surrounding fibrosis. The tumoral cells contained moderate amphophilic cytoplasm and small round nuclei with fine chromatin and conspicuous single central nucleoli. Immunohistochemical interrogation of these cells revealed absent staining with cytokeratin

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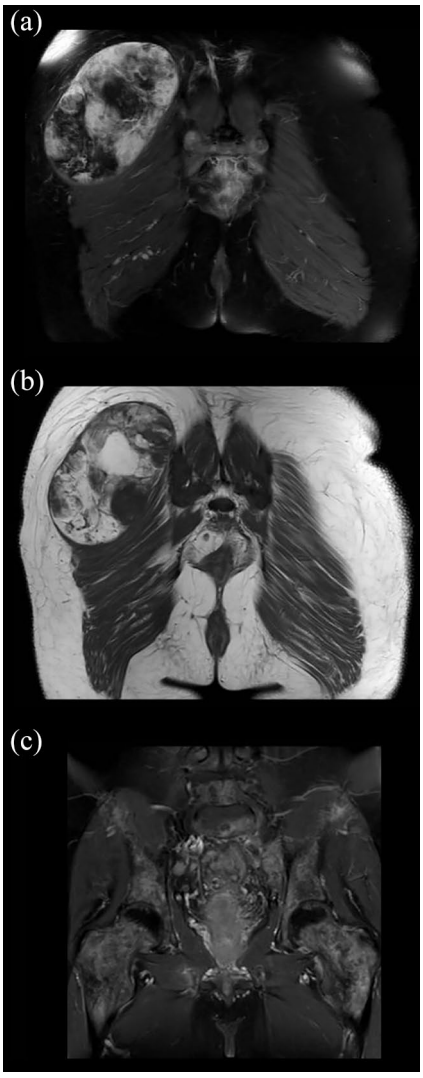

Figure 1. MRI images showing a heterogenous well-defined right gluteal soft tissue mass (a and b) and multifocal hypointense lesions of the pelvic bones and appendicular skeleton (c) suggestive of metastatic lesions.

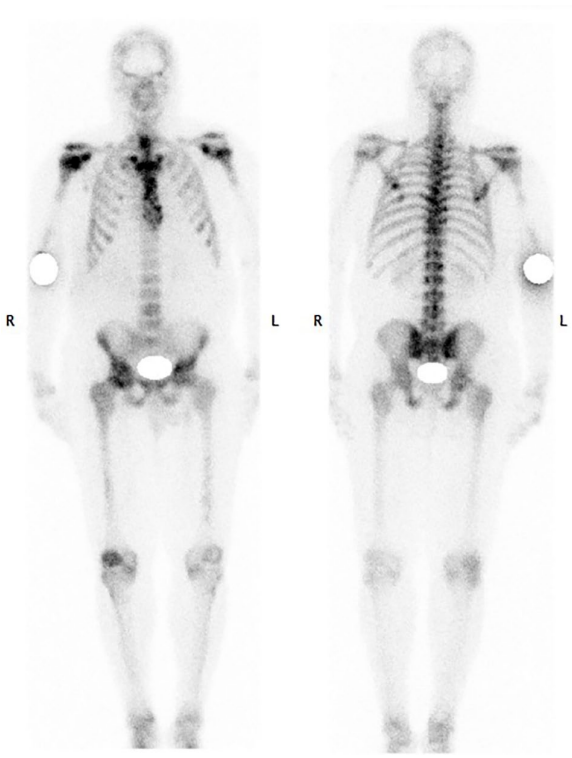

Figure 2. ^{99m}Tc methylene diphosphonate (MDP) bone scintigraphy demonstrating widespread osteoblastic skeletal metastases involving the axillary and appendicular skeletal system.

(CK) 7, CK20 and prostate-specific antigen (PSA), but NKX3.1 showed a diffuse strong positive labelling.

Further workup showed an elevated PSA (269.1 ng/ml), and acinar adenocarcinoma of the prostate (Gleason grade 4+4) was confirmed on transrectal biopsy of the prostate. Therefore, it was decided at the Uro-Oncology multi-disciplinary clinic to initiate androgen deprivation therapy (ADT) with long-acting three monthly goserelin with additional short-term cover with bicalutamide for the testosterone flare. In addition, he was commenced on systemic docetaxel. He has shown an excellent PSA response and remains asymptomatic with complete resolution of the size of the gluteal metastasis at the most recent follow-up 9 months later.

Discussion

An analysis by the Centers for Disease Control and Prevention (CDC) reported that the percentage of patients diagnosed with mPCa increased from 4% to 8% between 2003 and 2017 despite a drop in overall age-adjusted incidence of prostate cancer during the same period.[2] The situation is even more dire in Africa, where most new diagnoses are advanced/metastatic cancers.[3] Metastatic lesions to the bone and lymph nodes are common, while lesions to the lungs, pleura, liver and adrenal glands less so. The presence of soft tissue metastases from a prostate adenocarcinoma is extremely rare, with only a handful of case reports being published in the literature.[4–9] The soft tissue metastasis may be the index presentation for the diagnosis of mCaP,[4–7] as was the case in our patient, or it

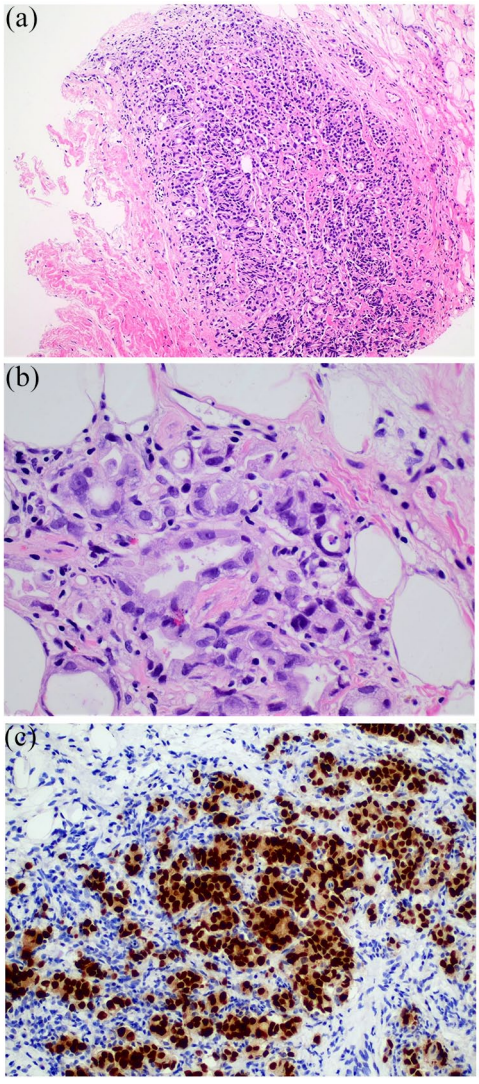

Figure 3. (a) Microscopic images showing monomorphic malignant epithelial cells arranged in fused and poorly formed glands, as well as small nests (haematoxylin and eosin, 100×); (b) gland-forming cells with moderate amphophilic cytoplasm, round nuclei and distinct nucleoli (haematoxylin and eosin, 400×); and (c) NKX3.1 immunohistochemistry showing strongly diffuse nuclear expression in the neoplastic cells, associated lymphocytes and fibroblasts is negative (200×).

may occur a few years after the initial diagnosis of mCaP.[8,9] Of the six reports identified in the literature, three authors reported cases with proven orbital soft tissue metastases.[6,7,9] The patients had initially presented to the ophthalmologic clinic with varying degrees of proptosis and decreased visual acuity. Subsequent biopsy of the suspicious extraconal orbital lesions confirmed the presence of metastatic adenocarcinoma of the prostate. It was worth noting that despite the soft tissue mass in the orbit, adjacent bony structures showed no evidence of bone erosion or osteoblastic disease.[6,9] On histopathological examination of the biopsy specimen from the gluteal mass in our patient, immunohistochemistry with PSA and prostate-specific acid phosphatase (PSAP) was negative and with NKX3.1 was positive. PSA is a cytoplasmic marker with high sensitivity and specificity but is often expressed at low levels, focally or not at all in poorly differentiated primary and metastatic tumours.[10] *NKX3.1* is a prostatic tumour suppressor gene and a novel immunohistochemical marker showing strong, crisp nuclear expression in prostate adenocarcinoma. NKX3.1 has a sensitivity of 98.6% and a specificity of 99.7% for identifying mPCa.[11] This is superior to the traditional PSA and PSAP markers and is particularly useful in poorly differentiated tumours (Gleason pattern 4 and 5).

Optimal management of mPCa continues to evolve. However, androgen suppression with ADT, through either chemical or surgical means, has been the mainstay of treatment for more than 50 years.[12] Monotherapy with ADT was previously considered the gold standard for hormone-sensitive mCaP. ADT monotherapy is now used in combination with new hormone therapies, taxane-based chemotherapy or radiotherapy. Our patient was treated with ADT combined with chemotherapy (docetaxel). Other recommended options for hormone-sensitive mCaP include ADT combined with abiraterone acetate plus prednisone or apalutamide, or enzalutamide.[13] He was asymptomatic at first presentation and has remained so; palliative radiotherapy was therefore deferred.

Conclusion

We report a rare case of metastatic prostatic adenocarcinoma presenting as a gluteal soft tissue mass. All clinicians should be cognizant of this association and have a low threshold to biopsy any suspicious soft tissue lesions.

Consent for publication

Written informed consent was obtained from the patient for the anonymised information and the accompanying images to be published in this article.

Author contribution(s)

Jeff John: Conceptualization; Supervision; Writing – original draft; Writing – review & editing.

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Conflict of interest statement

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