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Careful consideration of sarcoidosis in diagnosis and staging of prostate cancer: A case report

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ABSTRACT

Osseous sarcoidosis can masquerade as metastatic prostate cancer. Awareness of this is helpful in the staging of prostate cancer in a patient with sarcoidosis.

1. Introduction

Sarcoidosis, also known as Besnier-Boeck-Schaumann disease, is a systemic inflammatory disease in which inflammatory cells can form non-caseating granulomas.[1] Typically, it presents as bilateral hilar lymphadenopathy with pulmonary manifestations occurring in 87–97% of patients.[1] However, sarcoidosis can have bone involvement with osseous sarcoidosis being a rare manifestation of the disease.[1] Osseous sarcoidosis is usually discovered incidentally as most patients are asymptomatic. When discovered it is important to consider metastatic cancer in the differential diagnoses.

Prostate cancer is the most common solid cancer affecting men worldwide.[2] In advanced stages of prostate cancer, bone metastases can be present.[2] In the presence of known sarcoidosis, differentiating osseous sarcoid lesions from prostate cancer metastases is critical to proper disease management.[1–3]

This is a case of a patient with known sarcoidosis that underwent a prostate MRI that led to the diagnosis of prostate cancer.

2. Case presentation

A 73-year-old male was referred to the urology office from his primary care physician due to concern about the elevation in his prostate-specific antigen (PSA) level. The level had slowly been going up over time with a recent PSA of 3.81 ng/mL. Prior levels taken annually were 3.61 ng/mL, 2.92 ng/mL, 3.13 ng/mL, 2.75 ng/mL and 1.99 ng/mL. His past medical history was significant for sarcoidosis diagnosed a few years earlier when a chest CT showed mediastinal lymphadenopathy. Lymph node biopsy at that time confirmed the diagnosis. He had no family history of prostate cancer, digital rectal exam (DRE) was benign, and he had never undergone a prostate needle biopsy in the past. He presented to the urology office with an initial MRI final report that read there was a 2.0 cm PIRADS 5 lesion at the anterior transition zone involving the anterior fibromuscular stroma with extra prostatic extension; there were also numerous abnormal bone lesions in the pelvis.

A transrectal prostate biopsy was performed including targeting of the PIRADS 5 lesion. The prostate biopsy showed 2 of 3 positive cores taken from the PIRADS 5 lesion with one core being 80% of Gleason 3 + 3 = 6 disease and the second core being 10% of Gleason 3 + 3 = 6 disease. The ultrasound showed extra prostatic extension providing the clinical staging of T3a disease. All other standard 12-core biopsies showed benign prostatic tissue. CT and bone scan showed no evidence of metastatic disease. There were no lesions detected on the bone scan that had been previously seen on MRI.

A prostate-specific membrane antigen (PSMA) scan showed moderate increased uptake within the prostate gland with mild midline intensity with some nodularity, and no extracapsular extension, regional, or distant metastases detected. Bone biopsy was deferred as it was concluded that the bone lesions were likely sarcoidosis as they were negative on bone scan and PSMA scan.

Ultimately the patient was scheduled to undergo radiation therapy for the T3a Gleason 3 + 3 = 6 disease, Grade group 1 with close follow up.

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3. Discussion

Sarcoidosis has been reported as a mimicker of bone metastasis in several different cancer types, including prostate cancer.[1,3] While osseous involvement of sarcoidosis is rare, it is important to consider in patients with this history.[1] In patients with osseous involvement, 90% of those patients had lesions in the spine or pelvis.[1] It is critical to understand a patient's medical history and consider the full clinical picture to develop full differential diagnoses.[3] Other differentials of bone lesions that mimic osseous metastasis include bone cysts, fibrous dysplasia, primary bone tumors, tuberculosis, and osseous insufficiency.[4] Proper diagnosis of bone lesions in the setting of a possible or known cancer diagnosis can significantly change management of disease.

The patient presented in this case had a workup that was different in that he had an age-appropriate PSA and only one instance of increased PSA velocity. The prostate MRI revealed a concerning picture of potentially advanced prostate cancer. Due to his clinical T stage being T3a, this places the patient in a high-risk level for recurrence after treatment despite having a PSA <10 ng/mL, normal DRE, and a Grade Group 1 prostate cancer.[2] CT and bone scan suggested organ confined disease with no evidence of metastasis, which warranted further imaging with a PSMA positron emission tomography (PET)/CT scan to further evaluate the bone lesions on MRI.

There is a thought that the newer scan techniques such as the 18F-flouride PET/CT scans, including the F-18 PSMA scan used in our patient, have potential to become the ideal imaging modality to accurately identify metastatic skeletal lesions.[3] These PET scans detect high metabolic activity and show certain radiologic markers depending on the type of study. PSMA has a high specificity of expression in prostate tissues and is a membrane-bound binuclear zinc metallopeptidase or a folate hydrolase.[5] Activated macrophages, present in autoimmune diseases, have high levels of folic acid receptors, which may react with the folate hydrolase of the PSMA, and could result in a false positive PSMA scan in the setting of osseous sarcoidosis.[5] The sensitivity and specificity of the PSMA test for detecting prostate cancer is 76.6% and 100% respectively.[5] PSMA has a negative predictive value of 91.4% and a positive predictive value of 100%.[5] Invasive confirmatory testing with bone biopsy may be an unnecessary use of resources and cause patient morbidity.[3] However, each patient situation needs to be considered on an individual basis with the risks as there is no consensus on whether a skeletal biopsy must be performed in these situations.[3] In the case of our patient, bone biopsy was deferred due to the lack of evidence pointing to metastatic disease on the PSMA PET/CT as well as the initial CT and bone scan. The overall clinical picture with the patient's history, low PSA and Gleason score all supported osseous sarcoidosis.

4. Conclusions

Osseous sarcoidosis can masquerade as metastatic prostate cancer. In a patient with sarcoidosis, osseous lesions seen on MRI need to be differentiated from metastatic disease. This is important to determine proper disease staging and management.

CRediT author statement

Mallory E. McCormick: conceptualization, investigation, roles/writing – original draft, writing – review and editing, visualization. **E. Bradley Pewitt:** conceptualization, writing – review and editing, validation, supervision.

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Declaration of competing interest

The authors declare no conflict of interest.

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