Manifestation of Isolated Vertebral Osseous Sarcoidosis: A Case Report

Mujtaba Azhar Siddiqui, MD; Unsa Khan, MD; Noor ul Sabah, MD; Asadulla Mohammed, MD

ABSTRACT

Introduction: Isolated vertebral osseous sarcoidosis is a rare form of sarcoidosis that may mimic malignancy or infection and can be difficult to diagnose in the absence of systemic symptoms.

Case Presentation: A 70-year-old African American woman presented with lower back pain, 5 years after an initial evaluation of incidental vertebral lesions identified on positron emission tomography imaging. Repeat imaging showed a lesion in the T4 vertebra. Computed tomography-guided biopsy and thorough evaluation excluded infection and malignancy, confirming vertebral sarcoidosis.

Discussion: Few cases of vertebral sarcoidosis have been reported, usually presenting with localized pain and lytic or sclerotic vertebral lesions. Diagnosis requires histopathologic confirmation and exclusion of alternative etiologies. Early recognition is important, as corticosteroid treatment often improves outcomes.

Conclusions: Sarcoidosis should be considered in the differential diagnoses of vertebral lesions, even in the absence of systemic involvement.

INTRODUCTION

Sarcoidosis is a multisystem granulomatous disorder characterized by the formation of nonnecrotizing granulomas, most commonly affecting the lungs and lymphatic system. However, it may also involve other organs, including the skin, eyes, bones, liver, spleen, heart, upper respiratory tract, and nervous system.[1] The incidence of sarcoidosis is notably higher in African Americans, with a threefold greater age-adjusted annual incidence compared with that of White individuals.[2] Osseous involvement in sarcoidosis is relatively uncommon, occurring in approximately 1% to 13% of cases, with vertebral involvement being particularly rare.[3] Diagnosis requires clinical, radiologic, and histopathologic evidence of noncaseating granulomas, as well as exclusion of other granulomatous diseases and malignancies.[4]

This report contributes to the limited literature on vertebral sarcoidosis by presenting the case of a 70-year-old African American woman without systemic symptoms who was ultimately diagnosed with isolated vertebral sarcoidosis after a comprehensive diagnostic workup.

CASE PRESENTATION

A 70-year-old African American woman with a history of asthma initially underwent positron emission tomography (PET) because of concern for possible malignancy or infection based on her presenting symptoms. The PET scan revealed hypermetabolic nodules and subtle osseous lesions. Five months later, she was admitted for ovarian vein thrombosis. A repeat PET scan was performed to evaluate for potential metastatic disease or occult malignancy in light of the incidental osseous findings on the prior scan. Findings demonstrated moderate degenerative skeletal changes, with focal pathologic activity most pronounced in the T4 vertebral body (Figure 1). A computed tomography (CT)-guided core biopsy of the T4 vertebra revealed benign bone tissue with nonnecrotizing granulomatous inflammation, and chest radiography showed bilateral hilar adenopathy without additional abnormalities (Figure 2).

During the diagnostic evaluation, the differential diagnosis included malignancy, infectious etiologies, inflammatory disorders, and other metabolic or degenerative conditions. Malignant

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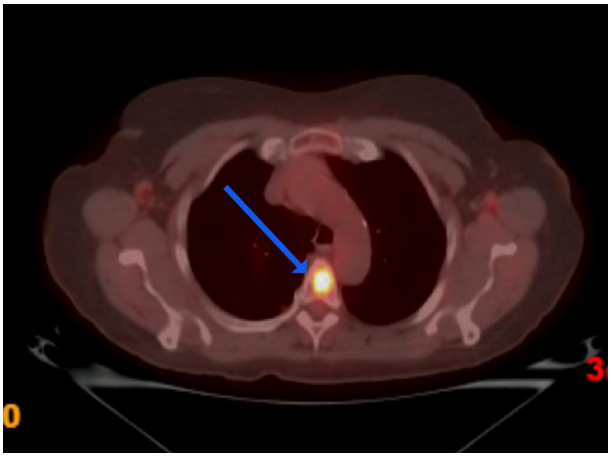
Author affiliations: Dow University of Health Sciences, Karachi, Pakistan (Khan, Siddiqui); Quaid-e-Azam Medical College, Bahawalpur, Pakistan (Sabah); Lung Allergy and Sleep Medicine Center, Berkley, Michigan (Mohammed).

Corresponding author: Noor ul Sabah, MD, Bahawalpur Cantt, Bahawalpur, 63100, Pakistan; ORCID ID 0009-0008-9160-0111

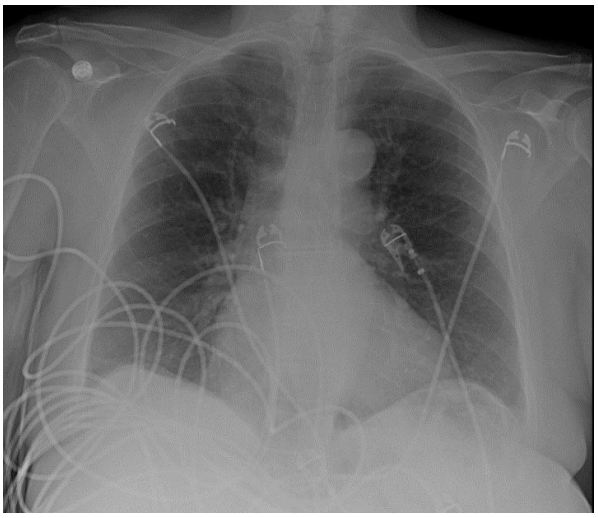
Figure 1. PET Scan Highlighting Increased Uptake in the T4 Vertebral Body



Axial PET image demonstrating a focal area of increased radiotracer uptake in the T4 vertebra (blue arrow), suggestive of active inflammatory or granulomatous pathology consistent with osseous sarcoidosis.

Abbreviation: PET, positron emission tomography.

Figure 2. Chest X-Ray Demonstrating Bilateral Hilar Lymphadenopathy



Frontal chest radiograph reveals prominence of the hilar regions bilaterally, consistent with bilateral hilar lymphadenopathy—a classic radiologic finding commonly associated with sarcoidosis.

causes considered included metastatic disease, such as breast or lung cancer and multiple myeloma, as well as primary bone tumors. Infectious etiologies included tuberculosis and fungal infections, including histoplasmosis. Inflammatory disorders considered included sarcoidosis and chronic granulomatous disease. Other potential causes included Paget disease of bone and degenerative skeletal changes.

Laboratory results revealed an elevated serum angiotensin-converting enzyme (ACE) level of 81 U/L, alkaline phosphatase level of 172 U/L, and alanine aminotransferase level of 51 U/L. Serum calcium, white blood cell count, and inflammatory markers were within normal limits.

The patient reported only lower back pain and denied systemic symptoms, including fever, weight loss, or respiratory complaints. Evaluations for malignancy, including serum protein electrophoresis and tumor marker testing, and for infection, including fungal cultures and acid-fast bacilli (AFB) testing were negative.

Based on biopsy findings and the exclusion of other diagnoses, a diagnosis of vertebral sarcoidosis was established. The patient was started on oral prednisone, 50 mg daily for 15 days, followed by a taper of 5 mg every 5 days until reaching a maintenance dose of 10 mg daily. A follow-up PET scan was scheduled 2 months later. The patient declined methotrexate therapy but remains on corticosteroid treatment.

DISCUSSION

Vertebral involvement in sarcoidosis is exceedingly rare, accounting for less than 1% of all cases.[5] Osseous sarcoidosis is typically detected incidentally during imaging for unrelated conditions, as most patients do not exhibit symptoms directly attributable to bone involvement.[6] This likely contributes to the underdiagnosis of isolated osseous sarcoidosis.[7]

In this case, the patient's elevated serum ACE level (81 U/L) and bilateral hilar adenopathy on imaging were suggestive, though nonspecific, findings of sarcoidosis.[4,8] The absence of systemic symptoms, including fever and weight loss, and negative evaluations for malignancy (including tumor marker testing and imaging) and infection (including fungal/AFB cultures) narrowed the differential diagnosis. Vertebral sarcoidosis was ultimately confirmed by biopsy of the T4 vertebral lesion, which demonstrated nonnecrotizing granulomas—the histopathologic hallmark of sarcoidosis.[9] While elevated alkaline phosphatase level (172 U/L) and alanine aminotransferase level (51 U/L) could suggest hepatic involvement, normal serum calcium and inflammatory markers argued against hypercalcemia or alternative inflammatory etiologies.[10] These diagnostic challenges underscore why vertebral sarcoidosis is frequently misdiagnosed initially.

A key diagnostic challenge is distinguishing sarcoid-related granulomatous lesions from bone metastases. Although imaging techniques are useful for identifying lesion location and extent, they often lack specificity. Therefore, histopathologic confirmation by biopsy remains the gold standard for diagnosis.[11,12] In this case, biopsy of the T4 vertebral lesion revealed nonnecrotizing granulomatous inflammation—findings that, while suggestive of sarcoidosis, are not pathognomonic in isolation.[8] Because granulomas may occur in other infectious or inflammatory conditions, it is essential to exclude alternative etiologies, including malignancies, tuberculosis, and fungal infections.[9] Accordingly, the patient underwent an extensive diagnostic evaluation, includ-

ing a comprehensive metabolic panel, complete blood cell count, ACE testing, inflammatory marker assessment, malignancy screening, and fungal and AFB cultures. Results were unremarkable except for an elevated ACE level. Together with imaging and biopsy findings, these results supported the diagnosis of isolated vertebral sarcoidosis.

While asymptomatic osseous sarcoidosis may resolve spontaneously and not require systemic treatment,[10] corticosteroids remain the first-line therapy because of their demonstrated clinical and radiologic efficacy.[13,14] Given the patient's persistent back pain and biopsy-confirmed diagnosis, treatment with oral prednisone was initiated.

CONCLUSIONS

This case highlights isolated vertebral sarcoidosis, a rare manifestation of sarcoidosis that can mimic malignancy or infection. The diagnostic evaluation, including histopathologic confirmation and exclusion of alternative etiologies, underscores the importance of considering sarcoidosis in the differential diagnosis of vertebral lesions. Although imaging findings may raise concern for metastatic disease, definitive diagnosis requires biopsy and careful clinicopathologic correlation. Corticosteroid therapy was initiated because of persistent symptoms; however, the clinical course of isolated osseous sarcoidosis remains variable and warrants follow-up.

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