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Sarcoidosis as a cause of chronic back pain: A case report

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Abstract. While sarcoidosis is typically a multisystem disease, it can, in some instances, exclusively affect the vertebrae, leading to back pain. Additionally, sarcoidosis may manifest with inflammation of the sacroiliac joints, not meeting the criteria for spondyloarthritis, yet contributing to back pain. In this report, we present a case involving a previously healthy 55-year-old woman who sought medical attention due to chronic back pain. She was subsequently diagnosed with spinal sarcoidosis, based on MRI, PET scan, and biopsy results. Furthermore, treatment with prednisolone monotherapy demonstrated substantial improvement in her symptoms.

Key words: sarcoidosis, vertebrae, sacroiliac joint, back pain, imaging, pathology, management

Introduction

Sarcoidosis is a chronic idiopathic multisystem inflammatory disorder, frequently affecting organs such as the lungs, skin, eyes, and lymph nodes (1). It is characterized by the development of non-caseating granulomas. While bone involvement, known as osseous sarcoidosis, is a rare occurrence, it typically manifests in patients with systemic disease. The digits' small bones, especially those in the fingers and toes, are commonly affected, but osseous sarcoidosis can also affect the skull, pelvis, long bones, and vertebrae (2). Vertebral sarcoidosis is a rare entity that poses challenges in differentiation from metastatic lesions on imaging studies (3).There are reports of sacroiliac joint involvement, rarely bilateral (4). Osseous sarcoidosis is typically asymptomatic and often discovered incidentally; however, it can occasionally manifest with pain resembling spondyloarthritis (4).

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Case presentation

A 55-year-old woman, previously in good health, presented with a 5-year history of diffuse, dull pain in the lumbosacral region, radiating to the right leg. Physical examination revealed nearly full range of motion with tenderness localized to the right sacroiliac joints. Straight leg raising and femoral stretch tests demonstrated full range of motion, alongside normal muscle power, sensation, and reflexes. Blood investigations disclosed mild hypercalcemia, elevated sedimentation rate (ESR), and increased serum ACE levels (Table 1).

A thoracolumbar MRI revealed mild disc bulging, most prominent in the L4 to S1 region on the right, with indications of bursitis primarily observed at L4-L5. Additionally, low T2/high STIR rounded lesions were noted within the T11 and L2 vertebral bodies (Figure 1).

Positron Emission Tomography (PET) results displayed a few fluorodeoxyglucose (FDG)-avid lymph nodes in the left upper carotid chain, one in the right retroclavicular area, and multiple nodes in the anterior mediastinal, paratracheal, paravascular, and infracarinal regions. Hypermetabolic nodules were detected in the spleen and liver. Furthermore, hypermetabolic bone lesions were observed in T4,

Table 1. Laboratory investigations.

TESTS	RESULTS	REFERENCE RANGE	UNITS
WBC	6.2	4-10	GIGA/L
Hemoglobin	13.2	12-15.3	g/dl
Platelets	237	140-400	GIGA/L
Creatinine	0.7	0.5-1	mg/dl
Calcium	10.7	7.9-10.2	mg/dl
Phosphorus	4.2	2.7-4.5	mg/dl
Magnesium	27	15-27	mg/dl
Albumin	4.7	3.5-5	g/dl
Protein electrophoresis	Polyclonal gammopathy		
Total proteins	8	6-7.8	g/dl
25 OH vitamin D total	63	22-112	nmol/l
Parathyroid hormone (PTH)	28	10-55	pg/mL
C-Reactive Protein (CRP)	1.06	<0.5	mg/dl
ESR	46	<18	mm/hr
Iron	52	49-151	µg/dl
Ferritin	50	30-73.3	ng/ml
Intradermal reaction	negative		
Interferon-gamma release assay test	negative		
Wright and Brucella Serology	negative	<80	
C3 Complement	154	90-180	mg/dl
C4 Complement	35.5	10-40	mg/dl
Antinuclear Antibody (ANA)	negative	Negative/ No reaction at 1/100	TITER
C-ANCA	1.6	Normal< 5	U/ml
P-ANCA	1.6	Normal<5	U/ml
Anti CCP	<7.0	Negative <17	U/ml
Toxoplasma IgM Antibodies	0.32	Non-reactive <0.8	COI
Epstein Barr Virus IgM	1.2	Negative < 20	U/ml
CMV IgM	0.14	Non-reactive <0.7	COI
Angiotensin Converting Enzyme	118	16-85	U/L
HLA-B27	Negative		

T11, L1, L2, the left iliac crest, right sacrum, and right sacroiliac region (Figure 2). Hypermetabolic bone lesions were observed in T4 with a maximum Standardized Uptake Value (SUV) of 22.56, T11 (SUV = 16.80), L1 (SUV = 10.40), L2 (SUV = 14.60), left iliac crest (SUV = 10.08), right sacrum (SUV = 12.33), and right sacroiliac (SUV = 11.0). The lungs were clear, without evidence of lung nodules or lung masses. There were no suspicion for pleural or myocardial effusions (Figure 2).

A core biopsy of an anterior left para sternal mediastinal lymph node showed well-formed non caseating granulomas with giant cells and mild chronic inflammation with significant fibrosis (Figure 3). Immunohistochemistry showed scattered small CD-3 positive T- cells, CD20-positive B cells, and CD138 plasma cells with a polyclonal pattern of kappa and lambda light chain expression. IgG4 was positive in less than 5% of the plasma cells. Special stains were negative for fungal organisms and acid-fast bacilli.

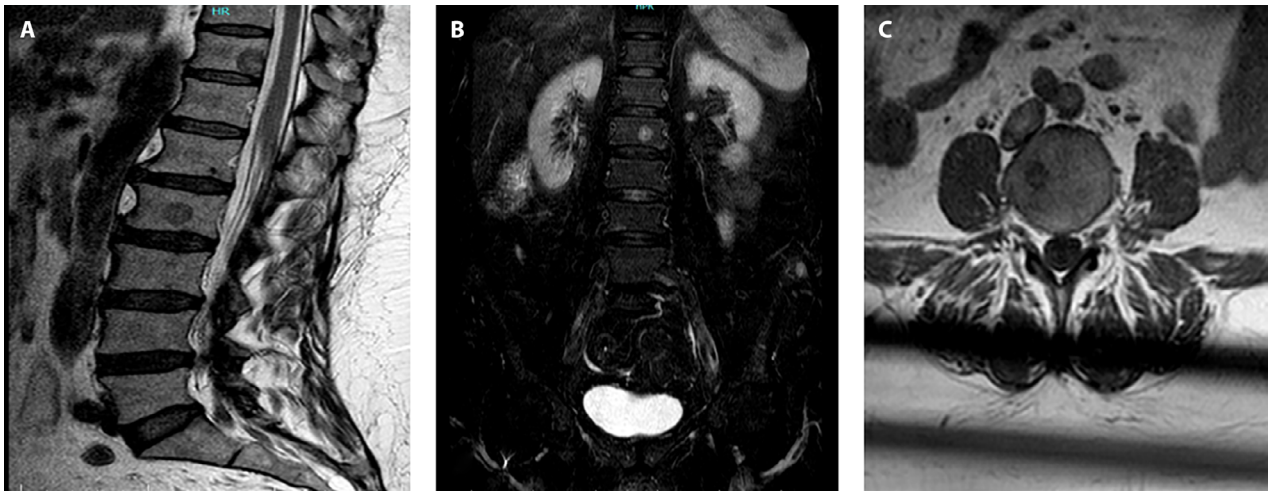

Figure 1. (A) Sagittal T2 Sequence MRI showing round lesions in T11 and L2 vertebral bodies. (B) Coronal STIR Sequence MRI showing round lesion in T11 vertebral body. (C) Axial T2 sequence MRI showing round lesion in L2 vertebral body.

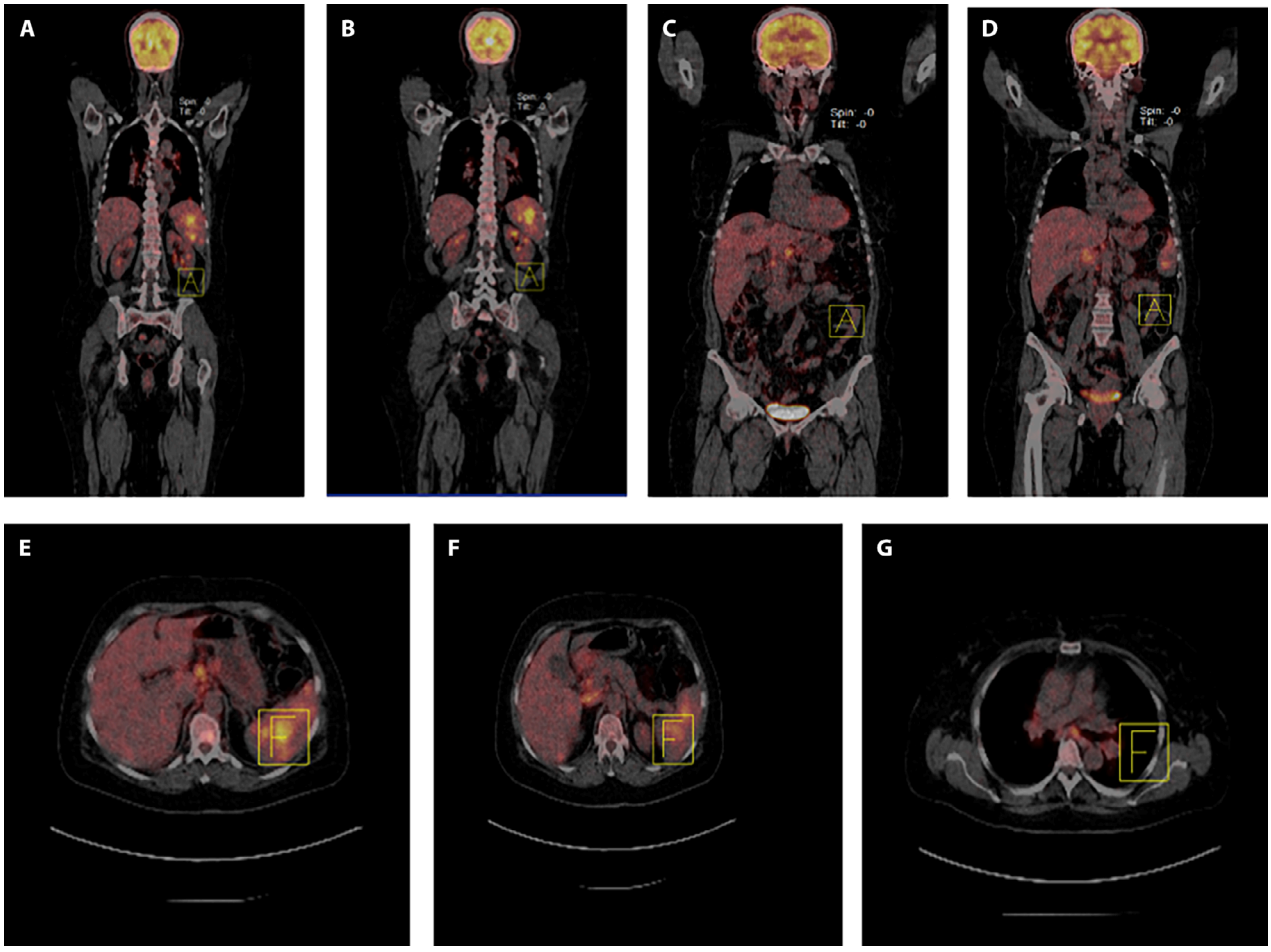

Figure 2. (A) Coronal fusion image of FDG PET scan showing hypermetabolic bone lesions in the right sacroiliac. (B) Coronal fusion image of FDG PET scan showing hypermetabolic vertebral body lesions in the thoracic spine. (C), (D) Coronal fusion images of FDG PET scan showing para-aortic and porta hepatic hypermetabolic lymph nodes. (E) Axial fusion image of FDG PET scan showing porta hepatic hypermetabolic lymph nodes. (F) Axial fusion image of FDG PET scan showing hypermetabolic nodule in the right liver lobe. (G) Axial fusion image of FDG PET scan showing hypermetabolic paratracheal and mediastinal lymph nodes.

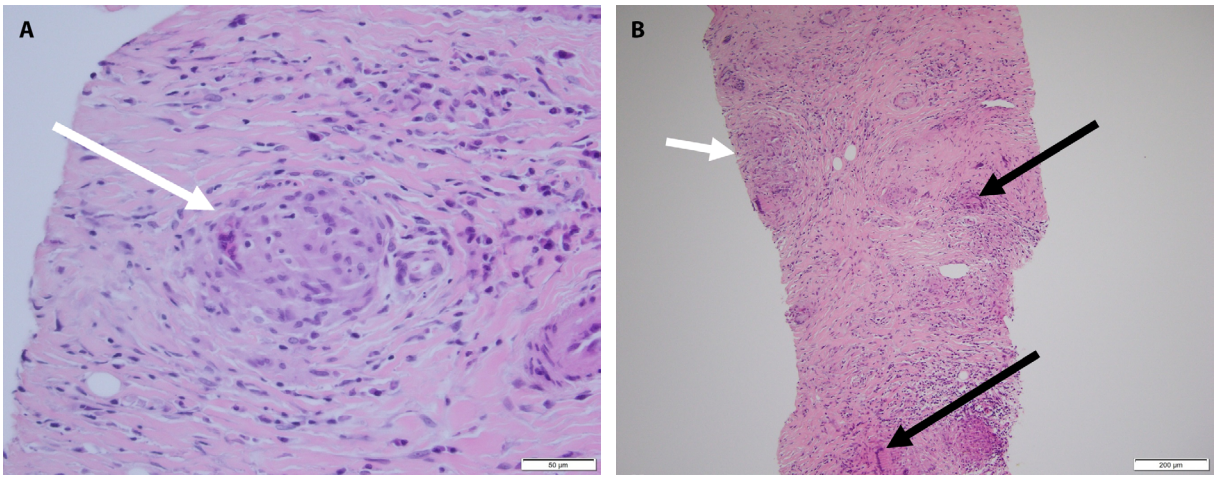

Figure 3. (A) High magnification of a well-formed non-necrotizing granuloma (arrow) composed of epithelioid histiocytes with surrounding fibrosis (400x). (B) Mediastinal lymph node core biopsy showing non-necrotizing granulomas (white arrow), multinucleated giant cells (black arrow) and fibrosis (100x).

The findings were consistent with a multisystemic sarcoidosis.

The patient was started on prednisolone 40 mg per day, accompanied by prophylactic bisphosphonate. Over time, her bodily and back pain began to progressively alleviate. After four months, her back pain had significantly diminished, and her ESR had returned to within normal limits.

Discussion

In our patient, the involvement of the right sacroiliac joint appears to be highly probable as the underlying cause of her back pain, which radiated down the back of her right leg. The likelihood of sarcoid bony lesions contributing to the pain is relatively lower. Additionally, degenerative disc changes could have played a role in the patient's symptoms. It is worth noting that the significant and prompt response to prednisolone treatment is noteworthy, albeit with the acknowledgment that corticosteroids can have substantial analgesic effects. Furthermore, sacroiliitis may manifest as a primary presentation of sarcoidosis.

The co-existence of sarcoidosis and sacroiliitis has been limited to three cross-sectional studies and a total of 36 patients from case reports and series (5). The incidence of sacroiliitis in sarcoidosis was reported to be as high as 6.6% (4). Very rarely, sacroiliitis may be the initial manifestation of sarcoidosis (6).

Glucocorticoids are the mainstay of treatement in sarcoidodosis (5). However, certain biological agents, especially tumor necrosis factor (TNF)-alpha inhibitors, such as infliximab, can be used effectively in severe cases resistant to standard therapy (7). Anti-TNF therapy can itself induce a granulomatous reaction. Long follow-up studies are needed to asses response to treatment.

Conclusion

Back pain can indeed manifest as a symptom of vertebral sarcoidosis, a rare condition characterized by the involvement of sarcoid lesions in the spine, sometimes without pulmonary involvement. It is important to exercise caution and conduct a meticulous review of imaging studies since there can be overlapping diagnostic considerations. Sacroiliitis is another entity that can complicate the presentation of back pain in cases of spinal sarcoidosis. In such scenarios, glucocorticoids may be employed to address both conditions. However, it is worth noting that further research is required to ascertain treatment options for cases that do not respond to steroid therapy.

Conflict of Interest: The authors declare that they have no conflict of interest related to the publication of this article.

Ethical Approval: All procedures in studies involving hu-man participants were in accordance with the ethical standards of the institutional and/or national research committee and with the

1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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