



Case Report

Extramedullary myeloid sarcoma mimicking tuberculosis of spine: A case report and literature review

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ABSTRACT

Background: A definitive diagnosis of spinal tuberculosis (TB) remains challenging. The “gold standard” is to obtain histopathological confirmation of the lesion. This analysis highlights how to avoid missing the diagnosis of an extramedullary myeloid sarcoma (EMS) versus TB.

Case Description: A 25-year-old male presented with paraparesis. Although this was first attributed to TB spondylodiscitis, a PET-CT and reevaluation of the biopsy specimen both confirmed the diagnosis of an EMS.

Conclusion: Nontubercular spinal disease should be suspected when a patient deteriorates despite the institution of antitubercular therapy for a reasonable duration. Further, microbiological and/or pathological confirmation is warranted to direct appropriate treatment and differentiate spinal TB from other entities as, in this case, an EMS.

Keywords: Myeloid sarcoma, Spine, Tuberculosis

INTRODUCTION

Extramedullary myeloid sarcoma (EMS) may involve any organ or tissue. Skin, bone, and lymph nodes are most frequently affected, with vertebral involvement being extremely rare. Here, we present a 25-year-old male who was originally diagnosed and treated for tuberculosis (TB) of spine, where the ultimate correct diagnosis was EMS.

CASE REPORT

A 25-year-old male originally presented with mid-back pain of 2 months duration. After a T8 thoracic CT-guided biopsy, he was diagnosed/treated for TB spondylitis with bed rest and appropriate antibiotic therapy. However, 1 month following his initial presentation, he developed worsening of his mid-back pain (VAS score 8), chest pain, shortness of breath, and a progressive lower extremity paraparesis (3/5 proximal and 4/5 distal).

X-ray and MR studies

The chest X-ray showed a pleural effusion, while the thoracic spine X-ray demonstrated T8 vertebral collapse. Further, the thoracic spine MRI showed a posterior epidural collection

extending from T7 to T9 resulting in cord compression. Of interest, lumbar X-rays and lumbar MR scan both demonstrated an additional although smaller, asymptomatic L3 vertebral body lesion [Figures 1 and 2].

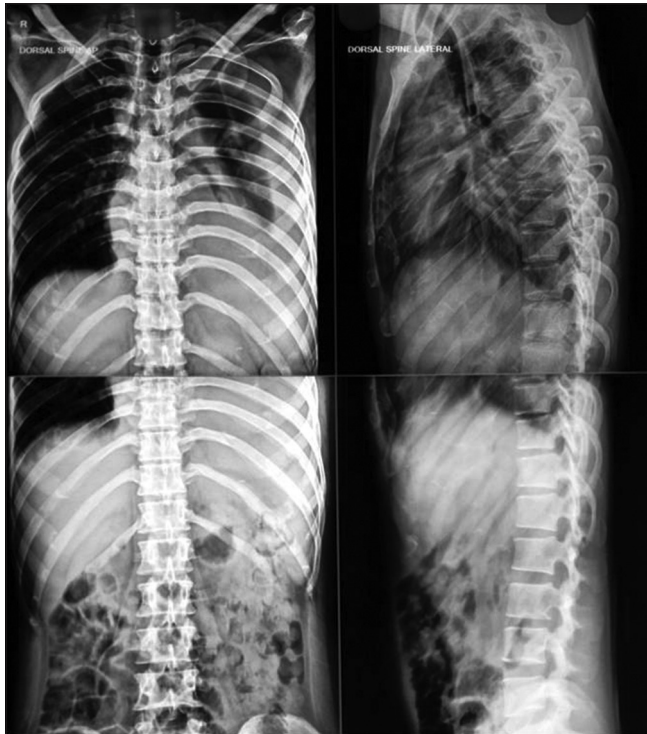


Figure 1: Preoperative X-ray whole spine anteroposterior and lateral view showing osteolytic lesions in D8 and L3 vertebral bodies with erosion and collapse of D8 vertebra.

Surgery

The patient's progressive myelopathy prompted a T8, T9 laminectomy that included a culture/biopsy of the lesion, epidural debridement, and T6-T10 pedicle screw fixation [Figure 3]. Notably, at the T8 level, there was a nonpurulent, soft, grayish-white material found in the center of the T8 vertebral body that appeared more consistent with tumor than tubercular infection.

Pathology/culture

The pathology showed only inflammatory granulation tissue, and the staining for all organisms, including *Mycobacterium tuberculosis* (MTB), was negative [Figure 4].

Postoperative course

Postoperatively, the patient's back pain (VAS score 2) improved, and he showed significant neurological recovery (e.g., 4/5 function proximally, 5/5 distally). However, within 3 days, he developed an increased left-sided pleural effusion (1700 cc). Tissue culture and MTB DNA reverse transcriptase-polymerase chain reaction of the fluid were negative. Four weeks postoperatively, when he returned with dyspnea and cough, the PET-CT scan revealed a metabolically active osteolytic lesion predominantly involving the T8 vertebral body, with extension into the T7, T9, and T11 vertebral bodies, involving the left 7th rib, as well as multiple other sites [Figure 5a].

Biopsy of the left 7th rib and immunohistochemistry studies confirmed that the lesion was an EMS [Figure 5b]. At that



Figure 2: Preoperative MRI sagittal and axial T1- and T2-weighted images showing collapsed D8 vertebral body with surrounding free fluid extending posteriorly from D7 to D9 vertebra and causing significant compression of spinal cord with a lesion in L3 vertebral body causing dural sac indentation.

Table 1: Review of literature of extramedullary sarcoma involving spine.

S. No.	Author/ year	#Patients Location of tumor	Treatment laminectomy chemo-RT	Outcome
1.	Landis <i>et al.</i> , 2003	1 patient Thoracic (T8-T9)	Laminectomy T8, T9 and excisional biopsy of tumor followed by chemo	6 months postcompletion of chemo, he remains in remission
2.	Kalayci <i>et al.</i> , 2006	1 patient Thoracic (T3-T5)	Laminectomy T3 to T5 and excisional biopsy of tumor followed by chemo and RT	8 months postoperatively, no recurrence and patient is walking with a cane
3.	Seok <i>et al.</i> , 2010	32 patients Lumbosacral and thoracic	Laminectomy and excisional biopsy in four patients Chemo and RT in all	In 21 patients followed 1 year postoperatively, 9 had complete reduction, and 12 had partial reduction in tumor volume
4.	Gupta <i>et al.</i> , 2014	1 patient Cervicothoracic (C5-T1)	Laminectomy C5 to T1 with tumor debulking	Patient died 4 days postoperatively due to respiratory failure
5.	Krishnan <i>et al.</i> , 2015	1 patient Thoracic (T7)	Laminectomy T6 to T8 and excisional biopsy followed by chemo and RT	2 years postoperatively, patient had no back pain or any residual deficits
6.	Alaya <i>et al.</i> , 2017	1 patient Thoracic (T4-T7)	Laminectomy T4 to T7 and excisional biopsy followed by chemo	7 years postoperatively, there are tumor remission and residual circumduction present

RT: Radiation therapy, Chemo: Chemotherapy

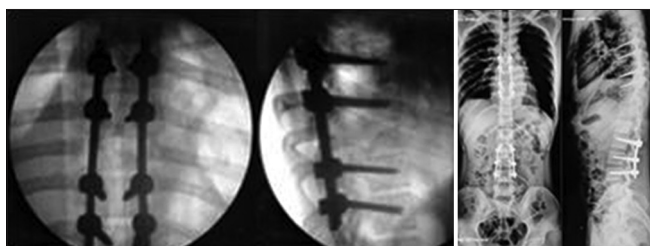


Figure 3: Postoperative X-ray postdecompression X-ray spine anteroposterior and lateral views showing pedicle screws inserted from D6 to D10 and L2-L4 vertebral levels sparing involved D8 vertebra.

point, the patient was referred for chemotherapy (e.g., cytarabine + daunorubicin). Now 1 year following the completion of chemotherapy, he remains asymptomatic, and the EMS has not yet recurred.

DISCUSSION

Frequency and differential diagnosis for EMS

EMS (also known as myeloid sarcoma MS, granulocytic sarcoma, or myeloblastoma) is rare. Patients ages can range from 1 to 81. EMS commonly affects skin, bone, and lymph nodes, but rarely presents in the spine.^[2,3] Misdiagnosis is often seen in EMS with differential diagnoses including lymphoma, undifferentiated malignancies, extramedullary hematopoiesis, and inflammatory pathologies (i.e., TB that is more common and endemic in India) [Table 1].^[4,6,8]

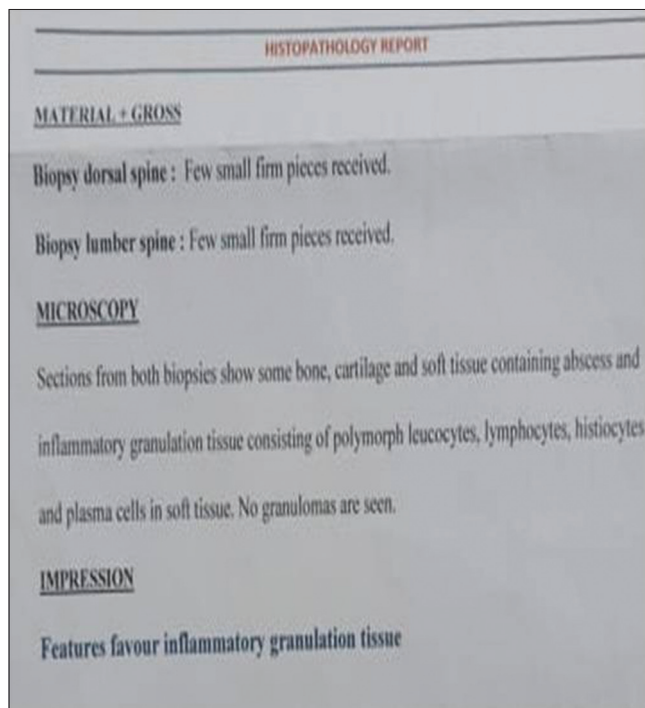


Figure 4: Histopathological examination report showing inflammatory granulation tissue.

Diagnostic studies for EMS

EMS can present as single or multifocal lesions; 2–8% of these patients will have acute myeloid leukemia (AML). CT and MRI studies help differentiate EMS from hemorrhage or abscesses. Stölzel *et al.* emphasized that fluorodeoxyglucose PET-CT also

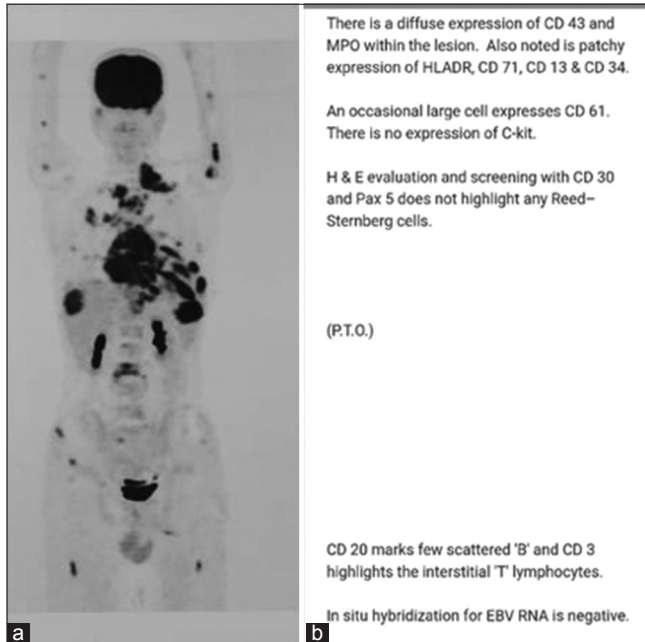


Figure 5: (a) PET-CT scan showed metabolically active osteolytic lesion predominantly in D8 vertebra and in multiple regions such as D7, D9, D11 vertebral bodies, left 7th rib, sternum, and right iliac bone along with bilateral pleural effusions, mediastinal, and left supraclavicular lymphadenopathy and soft-tissue lesions in the left orbit and left temporal region of brain. (b) Surgical site biopsy and its paraffin block with further biopsy from the left 7th rib and immunohistochemistry studies confirmed it to be extramedullary myeloid sarcoma.

additionally helped document extramedullary AML.^[7] There are also multiple treatment regimens for MS with or without AML, including conventional AML chemotherapy.^[1,5]

CONCLUSION

EMSs of the spine are rare. They must be biopsy confirmed to differentiate them from TB spondylodiscitis (i.e., in endemic areas) and other lesions.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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