

Multifocal Skeletal Tuberculosis Without Pulmonary Involvement: A Diagnostic Conundrum

Karamat Ali¹, Rida Inam², Shahzeb Satti³, Attiya Khaliq⁴

¹⁻⁴Department of Pulmonology and Medicine, Pak Emirates Military Hospital/National University of Medical Sciences (NUMS) Rawalpindi, Pakistan

ABSTRACT

A high level of clinical suspicion is necessary for the diagnosis of multifocal skeletal tuberculosis, while more recent studies can aid in radiological confirmation of the diagnosis. They could, however, occasionally be inaccurate, conflating the diagnosis with metastasis. The most reliable method of diagnosis is still a biopsy. Even in nations where TB is widespread, immunocompetent patients seldom experience multifocal skeletal involvement. Fortunately, it can be treated with successful outcomes. A rare case of Multifocal TB of lumbar vertebrae 3,4, ribs, sternum, and hip bones is reported in the case report. The patient had unusual radiological imaging results that were more indicative of multiple myeloma.

Keywords: Granulomatous inflammation, Immunocompetent, Lytic bone lesions, Malignancy, Multifocal skeletal tuberculosis

Authors' Contribution:

All authors contributed equally to the conception, literature search, manuscript drafting, editing and review

Correspondence:

Rida Inam
Email: ridainam588@gmail.com

Article info:

Received: August 21, 2025
Accepted: May 03, 2026

Cite this article. Ali K, Inam R, Satti S, Khaliq A. Multifocal Skeletal Tuberculosis Without Pulmonary Involvement: A Diagnostic Conundrum. J Islamabad Med Dental Coll. 2026; 15(2): 237-240. DOI: <https://doi.org/10.35787/jimdc.v15i2.1450>

Funding Source: Nil

Conflict of interest: Nil

Introduction

Tuberculosis (TB) can result in an isolated lytic bone lesion even in the absence of respiratory symptoms or known exposure, it should be distinguished from other causes. The low prevalence and low index of doubt among doctors, along with the vague and frequently indolent symptoms of extraspinal musculoskeletal tuberculosis, may cause a delay in diagnosis.¹ In 90±95% of documented instances, skeletal tuberculosis is restricted to one location. Mostly, the spine and major joints are affected. Although rare, multifocal involvement is typically linked to widespread illness. There is minimal information available on the prevalence of multifocal bone TB without pulmonary

involvement.² Disseminated illness, which accounts for 0.2% of all skeletal TB cases, is typically linked to multifocal disease.³ In immunocompetent individuals with normal lung function, multi-bone involvement of TB is exceptionally rare. In order to diagnose multifocal bone TB, physicians need to be highly cautious because patients may have a variety of ambiguous symptoms. When many devastating skeletal lesions are seen, multifocal skeletal tuberculosis must be taken into account in the differential diagnosis. Additionally, it may resemble malignant illness in both radiological and clinical aspects.⁴

We report a case of multifocal bone TB in an immunocompetent male.

Case Report

A 41-year-old previously healthy male presented with lower back and cervical pain, dry cough, low-grade fever, and recurrent vomiting for 2 years. Sharp pain in the back region radiating to front of chest, which had gradual onset, had been progressing since then. Physical activities aggravated pain, patient rated it 9/10 on pain scale because it affected daily activities. Cough was dry without any sputum or hemoptysis, didn't relieve by taking medicines. Patient had an intermittent pattern of low-grade fever, with evening spikes, highest value recorded to be 100 F. He took treatment from different hospitals but he didn't improve. His symptoms were associated with weight loss, insomnia and anorexia. His past medical and surgical history were insignificant. Patient denied any sort of addiction. His family history was negative for any such disease.

On examination, a thin pale-looking vitally stable male without any signs of clubbing, lymphadenopathy, or edema. Respiratory examination was normal with vesicular breathing. CVS examination was normal with S1, S2. Basic diagnostic workup was requested including Complete Blood Count (CBC), Chest X-ray (CXR), MRI Cervicodorsal spine. CXR was normal. CBC revealed hemoglobin reduced to be 11.2 (normal: 12-16 g/dL). MRI showed mild straightening of spine with multilevel abnormal signals in the bodies and pedicles of lower cervical and whole of thoracic spine. Post-contrast images showed minimal enhancements. Based upon this, Multiple Myeloma and metastasis were considered in differentials. Extensive workup was done, bone marrow trephine revealed reactive changes with 12% plasma cells. No paraproteins were found on serum and urine protein electrophoresis. Serum calcium, phosphate, vitamin D, and parathyroid hormone were in normal ranges. Furthermore, Beta-2 microglobulin levels were in the normal range i.e 2 (normal: 1.5-3). Kappa, lambda free light chains and kappa/ lambda ratio

were increased to 134 (normal: 3.3-19.4 mg/L), 60.6 (5.71-26.3 mg/L) and 2.36 (normal: 0.26-1.65) respectively. Bone scan for skeletal survey revealed multifocal skeletal metastasis to ribs and spine.

To rule out metastasis, CEA, Beta-HCG, CA 19-9, and AFP levels were checked and results were in the normal range. PCR for JAK 2 mutation was negative. Contrast-enhanced CT chest, abdomen, and pelvis revealed widespread lytic sclerotic lesions of all vertebral bodies and bilateral ischium, pubis, ilium, and ribs (Figure 1).

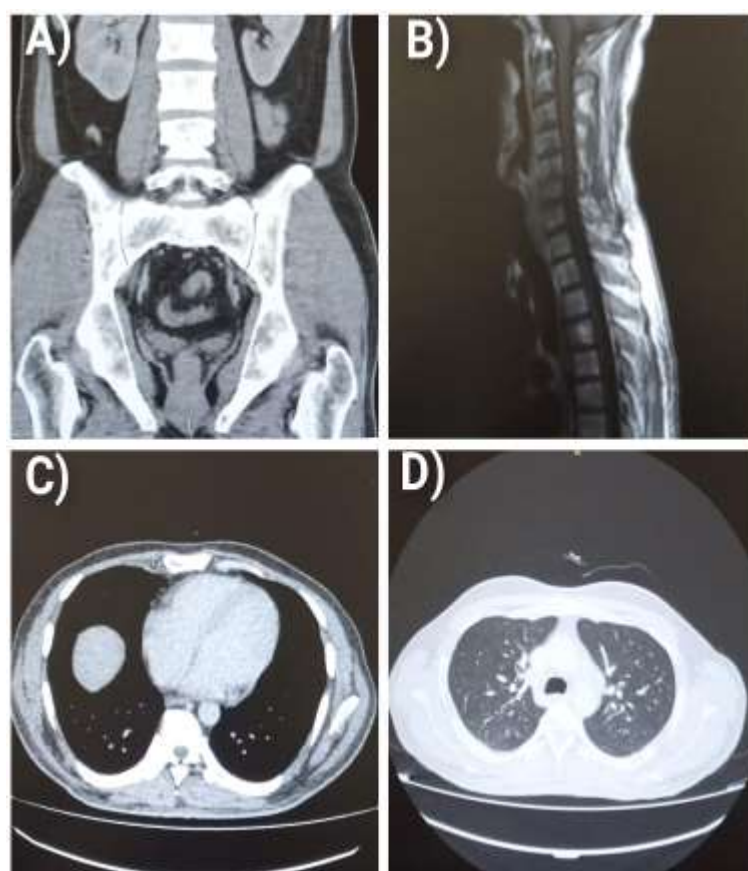


Figure 1: Pelvic CT scan (A) showing dark radiolucent areas in bony structures of pelvis or sacrum, (B) spinal MRI showing hypointense and hyperintense areas in the vertebral bodies highlighting lytic bone lesions. CT thorax (C,D) depicting lytic lesions of ribs.

CT-guided biopsy of right iliac lesion revealed reactive changes. CT-guided biopsy of LV3 revealed grade II fibrosis with chronic inflammatory infiltrate, mild chronic non-specific inflammation without any evidence of malignancy or plasma cell tumor. PET scan revealed widespread osseous lesions: splenic parenchymal uptake with parenchymal lesion and hepatic parenchymal uptake without parenchymal lesion. All tests were inconclusive and patient was given symptomatic management.

Further investigations were requested. PET CT depicted interval appearance of new lytic lesions at Sternum and LV4 Vertebrae, splenic parenchymal uptake with parenchymal lesion.

CRP and ESR were raised to 102 (normal: upto 5) and 85 (normal: 0-20 mm/hr) respectively. Re-biopsy of right iliac crest lesion was done which revealed chronic granulomatous lesion. Diagnosis of Disseminated TB with lytic bony lesions was made. Pulmonology team was taken on board, Bronchoalveolar Lavage detected MTB on genxpert with rifampicin sensitivity. High Resolution CT chest and 2D echo were unremarkable.

Patient was prescribed Anti Tuberculous Therapy (ATT) for 12 months, he was kept on regular follow-up. After 6 months of ATT, LV3 biopsy showed normal hematopoiesis, negative Bence Jones protein. Kappa, lambda free light chains and kappa/lambda ratio were 142.43 (3.3-19.4 mg/L), 90.6 (5.71-26.3 mg/L), and 1.57 (normal: 0.26-1.65) respectively, with reduction in kappa/lambda ratio. CRP returned within normal range. His pyrexia got relieved, patient became well clinically and his weight increased from 66 to 78 kg.

Discussion

Globally, tuberculosis is a leading cause of death and illness, accounting for around 1.6 million deaths annually. The World Health Organization reports that 8.8 million new cases of tuberculosis are diagnosed globally each year.⁵ 1–2% of all TB cases and 10%–20% of extrapulmonary symptoms can be

attributed to skeletal TB. Multifocal involvement is documented in 5–10% of skeletal cases, while the rate of multifocal spinal TB is reported to be between 7–10% and 25%.² Rare cases of multifocal skeletal tuberculosis have been seen in patients with normal lung results and those who are not immunocompromised. The most prevalent location of involvement is the spine, with 50% of all multifocal skeletal TB cases occurring in the upper lumbar and lower thoracic areas. Radiologically, the average number of vertebrae affected by multifocal TB is 2.5–3.8 in adults and 3.0 in children.⁵ In our patient, there were multiple lytic lesions in the ribs, sternum, multi-segment lumbar vertebrae, and ilium, ischium, and pubis.

The tuberculin skin test is highly effective for diagnosing skeletal tuberculosis. A negative skin test does not necessarily rule out TB.⁶ When a PPD test is negative, imaging is still the most effective diagnostic method even though radiological results do not always confirm the diagnosis. The presence of paravertebral and epidural abscesses, deterioration of two neighboring vertebral bodies, and degradation of the intervening disc are the hallmarks of spinal tuberculosis. In early stages of the disease, skeletal tuberculosis may mimic primary osseous lesions like eosinophilic granuloma or metastatic tumors on radiological images because it lacks distinctive features, especially when many destructive lesions are present. Unless there is a collapse of the disc border or vertebral body, plain radiography is not very helpful. Furthermore, early changes in the spinal marrow cannot be seen by CT scans, nor can they distinguish between neoplastic involvement and infectious diseases.^{5,6}

Young adults of Black ethnicity are more likely to have multifocal bone TB, and they frequently begin with a fistula complaint. In contrast to the white population, where multifocal bone tuberculosis is typically seen in the long bones of the extremities, in this community it is primarily found in the flat bones. Merely 0.1% of all TB cases are accompanied by rib tuberculosis, and the most typical sign is local pain

triggered by rib deterioration.⁷ According to Shi-Min's meta-analysis, 96 patients (60.4%) had solitary TB of the sternum, while only 31 patients (19.5%) had multifocal TB of the upper part of the sternum.⁸ This highlights that our patient had rare presentation of multifocal TB. Complete TB resolution is typically achieved with multidrug anti-TB medication, which includes isoniazid, rifampin, ethambutol, and pyrazinamide and is recommended for a period of 12 to 18 months.⁵ As demonstrated in the current study, medical treatment is quite beneficial when given correctly. To sum up, since extensive lytic lesions are uncommon in TB and many osteolytic lesions are misdiagnosed as cancer, the diagnosis is frequently postponed, necessitating a high index of suspicion for the possibility of TB in any patient with multiple lytic lesions of the skeletal system in TB-endemic countries.

References

1. Abdulla MC. Isolated lytic bone lesion in tuberculosis. *Int J Mycobacteriol* 2017;6(2):191-192. https://doi.org/10.4103/ijmy.ijmy_62_17
2. Chang DS, Rafii M, McGuinness G, Jagirdar JS. Primary multifocal tuberculous osteomyelitis with involvement of the ribs. *Skeletal Radiol* 1998;27(11):641-645. <https://doi.org/10.1007/s002560050451>
3. Jaiswal A, Nigam V, Jain V, Kapoor S, Dhaon BK. Multifocal skeletal TB or disseminated bone TB. *Trop Doct* 2006;36(3):178-180. <https://doi.org/10.1258/004947506777978091>
4. Marudanayagam A, Gnanadoss JJ. Multifocal skeletal tuberculosis: a report of three cases. *Iowa Orthop J* 2006;26:151-153
5. Zhang L, Wang J, Feng X, Tao Y, Yang J, Zhang S, et al. Multifocal skeletal tuberculosis: A case report. *Exp Ther Med* 2016;11(4):1288-1292. <https://doi.org/10.3892/etm.2016.3032>
6. Davidson PT, Horowitz I. Skeletal tuberculosis. A review with patient presentations and discussion. *Am J Med* 1970;48(1):77-84. [https://doi.org/10.1016/0002-9343\(70\)90101-4](https://doi.org/10.1016/0002-9343(70)90101-4)
7. Kaya A, Topu Z, Fitoz S, Numanoglu N. Pulmonary tuberculosis with multifocal skeletal involvement. *Monaldi Arch Chest Dis* 2004;61(2):133-135. <https://doi.org/10.4081/monaldi.2004.714>
8. Chehrastane G, Benaissa E, Radi A, El Hassani A, Elouennass M. Multifocal tuberculosis revealed by a sternal swelling in an immunocompetent child. *Access Microbiol* 2024;6(8):000795.v3. <https://doi.org/10.1099/acmi.0.000795.v3>