DOI: 10.21088/ijem.2395.311X.11325.10

Indian Journal of Emergency Medicine
Volume 11 Number 3, July–September 2025

CASE REPORT

Pulmonary Sarcoidosis Presenting with a Miliary Pattern Mimicking Tuberculosis: A Case Report

Shweta Awasthi[1], Abhijit Baral[2], Indranil Das[3]

HOW TO CITE THIS ARTICLE:

Shweta Awasthi, Abhijit Baral, Indranil Das. Pulmonary Sarcoidosis Presenting with a Miliary Pattern Mimicking Tuberculosis: A Case Report. Ind J Emerg Med. 2025; 11(3): 195-199.

ABSTRACT

Background: Sarcoidosis, a systemic inflammatory disease characterized by non-necrotizing granulomas, presents significant diagnostic challenges, particularly in regions like India where tuberculosis (TB) is highly endemic. Both conditions share clinical, radiological, and even some histological features, leading to potential misdiagnosis. This confusion is especially pertinent when sarcoidosis manifests with atypical radiological patterns, such as a miliary pattern, classically associated with disseminated TB. Accurate differentiation is critical, as the standard immunosuppressive therapy for sarcoidosis can have deleterious effects if administered for unrecognized TB.

Case Presentation: We present the case of a 45-year-old male residing in Kolkata, West Bengal, India, with comorbidities of type 2 diabetes mellitus and hypertension, who presented with a two-month history of progressive exertional dyspnea, dry cough, and chest discomfort. High-resolution computed tomography (HRCT) of the thorax revealed diffuse bilateral micronodules consistent with a miliary pattern, raising strong initial suspicion for miliary TB. However, comprehensive investigations were pursued. Sputum examinations for acid-fast bacilli (AFB) were repeatedly negative, as was polymerase chain reaction (PCR) for Mycobacterium tuberculosis in bronchoalveolar lavage (BAL) fluid. Fiberoptic bronchoscopy with transbronchial lung biopsy (TBLB) was pivotal, demonstrating multiple well-formed non-necrotizing epithelioid cell granulomas, characteristic of sarcoidosis. Serum angiotensin-converting enzyme (ACE) levels were notably elevated at 140 U/L. Fungal cultures and other relevant investigations were negative.

AUTHOR'S AFFILIATION:

[1] DNB Postgraduate Trainee, Department of Emergency Medicine Medica Superspeciality Hospital, Kolkata, West Bengal, India.

[2] Consultant, Department of Emergency Medicine, Medica Superspeciality Hospital, Kolkata, West Bengal, India.

[3] HOD, Department of Emergency Medicine, Medica Superspeciality Hospital, Kolkata, West Bengal, India.

CORRESPONDING AUTHOR:

Shweta Awasthi, DNB Postgraduate Trainee, Department of Emergency Medicine, Medica Superspeciality Hospital, Kolkata, West Bengal, India.

E-mail: drshwetawasthi@gmail.com

➢ **Received:** 09-04-2025 ➢ **Accepted:** 05-06-2025

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution NonCommercial 4.0 License (http://www.creativecommons.org/licenses/by-nc/4.0/) which permits non-Commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the Red Flower Publication and Open Access pages (https://www.rfppl.co.in)

Conclusion: Based on the compatible clinical picture, supportive ACE levels, exclusion of infectious etiologies (particularly TB), and definitive histopathological findings, a diagnosis of pulmonary sarcoidosis was confirmed. The patient was initiated on oral corticosteroids, with mycophenolate mofetil added early due to concerns regarding poor glycemic control. This case strongly emphasizes that sarcoidosis must be considered a key differential diagnosis for miliary patterns on chest imaging, even in high TB prevalence settings. It highlights the insufficiency of relying solely on radiological findings and underscores the essential role of histopathology via TBLB or other biopsy methods for accurate diagnosis, thereby preventing inappropriate anti-tuberculosis treatment and enabling timely, targeted therapy for sarcoidosis.

KEYWORDS

• Sarcoidosis • Tuberculosis • Miliary pattern • Granulomatous disease • Differential diagnosis • Non-necrotizing granuloma

INTRODUCTION

Sarcoidosis and tuberculosis (TB) are granulomatous diseases sharing significant clinical and radiological features, often creating diagnostic dilemmas.[1,2] Distinguishing between these entities is paramount, as inappropriate treatment based on misdiagnosis can have severe consequences; immunosuppressive therapy for sarcoidosis can exacerbate active TB.[3] In regions with a high burden of TB, such as India,[4] this distinction presents a frequent and significant diagnostic challenge. While miliary patterns on chest imaging are classically associated with disseminated TB, sarcoidosis is an important mimic capable of producing similar radiological findings.[5] This report details a case of pulmonary sarcoidosis presenting with a miliary pattern, initially misdiagnosed as miliary TB, illustrating the importance of current diagnostic strategies[6] and highlighting key differentiating features.

CASE PRESENTATION

A 45-year-old male with type 2 diabetes mellitus and hypertension presented with a two-month history of persistent dry cough, progressive dyspnea on exertion, and intermittent chest discomfort. On examination, his vital signs included a heart rate of 108 bpm, respiratory rate of 19 breaths/min, blood pressure of 160/90 mmHg, and oxygen saturation of 92% on ambient air. Bilateral fine inspiratory crepitations were noted on pulmonary auscultation. No other significant findings were present on physical examination.

INVESTIGATIONS

Initial workup focused on identifying the cause of respiratory symptoms and the miliary pattern on imaging. Key investigations and results are summarized in **Table 1**.

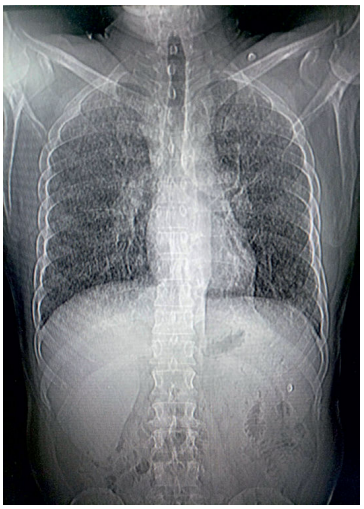


Figure 1: Chest CT scan showing bilateral miliary nodular infiltrates



Figure 2: Extensive, fine reticulonodular opacities in both lungs with reactive mediastinal lymphadenopathy

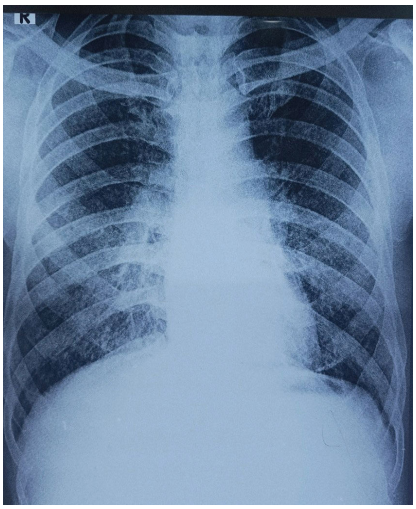


Figure 3: Chest X-ray showing miliary opacities

Table 1: Summary of Key Investigations and Results

Investigation	Result	Notes / Reference Range
Chest X-ray (Posteroanterior)	Diffuse, bilateral miliary nodular pattern	
High-Resolution CT (HRCT) Thorax	Diffuse, randomly distributed micronodules (1-3mm) throughout both lungs consistent with a miliary pattern; Mild mediastinal lymphadenopathy 5	
Sputum Acid-Fast Bacilli (AFB) Smear	Negative (x3 samples)	
Sputum TB Culture	Negative	
Fiberoptic Bronchoscopy	Normal airway appearance	
Bronchoalveolar Lavage (BAL)	TB PCR: Negative	
Transbronchial Lung Biopsy (TBLB)	Multiple well-formed, non-necrotizing epithelioid cell granulomas; Negative stains for AFB and fungi	Consistent with sarcoidosis
Tuberculin Skin Test (Mantoux)	Negative	0 mm induration
Serum Angiotensin-Converting Enzyme (ACE)	140 U/L	Elevated (Typical range ~8-52 U/L) 7
Complete Blood Count (CBC)	Within normal limits	
Liver Function Tests (LFTs)	Within normal limits	
Renal Function Tests (RFTs)	Within normal limits	
Serum Calcium	Within normal limits	
Ophthalmological Examination	Normal; No evidence of uveitis or choroidal tubercles	
HIV Serology	Negative	
Fungal Serology/Cultures	Negative (Blood and Sputum cultures)	

DIFFERENTIAL DIAGNOSIS

Given the miliary imaging in a TB-endemic setting, miliary tuberculosis was the primary suspicion.[4] Other considerations included sarcoidosis, known for atypical radiological presentations,[5,8] disseminated fungal infections, hypersensitivity pneumonitis, and lymphangitic carcinomatosis. Subsequent investigations were crucial for differentiation.

Diagnosis

Pulmonary Sarcoidosis was diagnosed based on compatible clinical and radiological features,[5,8] definitive histopathology (non-necrotizing granulomas via TBLB), rigorous exclusion of mimics (especially TB and fungal infections), and supportive elevated serum ACE.[7] This met accepted diagnostic criteria requiring clinicoradiographic features, histological evidence of non-caseating granulomas, and exclusion of alternative diagnoses.[1,6]

Treatment and Management

Following diagnostic confirmation, immunosuppressive therapy was initiated per current guidelines.[3,9] Oral prednisolone (40 mg daily) was started. Due to concerns regarding the patient's poor glycemic control associated with his diabetes mellitus, mycophenolate mofetil (MMF) was introduced early as a steroid-sparing agent,[10,11] aiming to minimize glucocorticoid toxicity. Co-morbidities, including hypertension and diabetes, were actively managed and optimized.

Outcome and Follow-up

The patient showed significant clinical improvement during hospitalization and was discharged on tapering prednisolone and maintenance MMF, with planned outpatient pulmonology follow-up for monitoring clinical status, lung function, and potential treatment-related adverse effects.

DISCUSSION

This case powerfully illustrates the diagnostic complexity arising when pulmonary

sarcoidosis presents with a miliary pattern, particularly in TB-prevalent areas like India[4,12]. Such presentations necessitate a high index of suspicion for sarcoidosis alongside TB.[6,8]

Our patient's case mirrors others reported from similar settings, where initial suspicion strongly favored TB based on imaging[12,13] As highlighted by Kumar *et al.* (2023) in their North Indian series,[13] relying solely on radiology can be misleading. While our patient had elevated serum ACE, this finding lacks definitive diagnostic specificity and sensitivity,[7] reinforcing the need for more conclusive evidence. The diagnostic cornerstone remained the histopathological demonstration of non-necrotizing granulomas via TBLB,[1,14] emphasizing the indispensable role of tissue diagnosis in resolving such dilemmas, a point consistently stressed in recent diagnostic guidelines and reviews.[6,14]

Excluding TB definitively before initiating immunosuppression is critical.[3,9] Our comprehensive approach, utilizing negative sputum smears, BAL PCR, TBLB stains, and tuberculin testing, aligns with recommended strategies for TB exclusion in high-burden areas.[14,15] This rigorous exclusion process was paramount.

The management was also tailored. Using MMF early reflects the contemporary approach to mitigating steroid side effects, especially pertinent given the concerns about steroid-induced worsening of glycemic control in this patient.[10,11] This aligns with evidence supporting MMF's efficacy as a steroid-sparing agent in sarcoidosis.[10] Long-term monitoring is essential for managing potential disease relapse and treatment-related complications.[3,9] This case underscores that even with classic 'miliary' imaging, clinicians must pursue a thorough, evidence-based diagnostic pathway rather than defaulting to the most common diagnosis for the pattern, especially when invasive procedures can provide histological certainty.

CONCLUSION

Miliary patterns on chest imaging in TB-endemic regions present a significant diagnostic challenge. This case demonstrates that pulmonary sarcoidosis is a crucial differential diagnosis that requires histopathological confirmation and careful exclusion of tuberculosis before initiating potentially harmful immunosuppressive therapy. A systematic approach, integrating clinical findings, imaging, microbiology, and, critically, tissue biopsy, is essential for accurate diagnosis and appropriate patient management, emphasizing the limitations of relying solely on radiological patterns in complex clinical scenarios.

Conflicts of interest: None

REFERENCES

1. Statement on sarcoidosis. Joint Statement of the American Thoracic Society (ATS), the European Respiratory Society (ERS) and the World Association of Sarcoidosis and Other Granulomatous Disorders (WASOG). *Am J Respir Crit Care Med.* 1999; 160(2): 736-55.
2. Iannuzzi MC, Rybicki BA, Teirstein AS. Sarcoidosis. *N Engl J Med.* 2007; 357(21): 2153-65.
3. Baughman R.P., Valeyre D., Korsten P., *et al.* ERS clinical practice guidelines on treatment of sarcoidosis. *Eur Respir J.* 2021; 58(6): 2004079. doi: 10.1183/13993003.04079-2020.
4. Sharma S.K., Mohan A., Sharma A., Mitra D.K. Challenges in the diagnosis & treatment of miliary tuberculosis. *Indian J Med Res.* 2012; 135(5): 703-30.
5. Criado E., Sánchez M., Ramírez J., Arguis P., de Caralt T.M., Perea R.J. Pulmonary sarcoidosis: typical and atypical manifestations at high-resolution CT with pathologic correlation. *Radiographics*. 2010; 30(6): 1567-86.
6. Valeyre D., Jeny F., Rotenberg C, *et al.* Sarcoidosis diagnosis and treatment: A multidisciplinary approach. *Lancet Respir Med.* 2023;11(7): 655-672. doi: 10.1016/S2213-2600(23)00079-X.
7. Ungprasert P., Carmona E.M., Crowson C.S., Matteson E.L. Diagnostic utility of angiotensin-converting enzyme in sarcoidosis: a population-based study. *Lung.* 2016; 194(1): 51-56. doi: 10.1007/s00408-015-9819-0.
8. Silva C.I.S., Müller N.L. High-Resolution Computed Tomography of Diffuse Lung Disease: Patterns and Differentials. *Radiol Clin North Am.* 2019; 57(3): 453-470. doi: 10.1016/j.rcl.2019.01.001.
9. Crouser ED, Maier LA, Wilson KC, et al. Diagnosis and Detection of Sarcoidosis. An Official American Thoracic Society Clinical Practice Guideline. *Am J Respir Crit Care Med.* 2020; 201(8): e26-e51. doi: 10.1164/rccm.202002-0251ST.

10. Cremers J.P., Drent M., Driessen R.J., *et al.* Mycophenolate Mofetil as a Corticosteroid-Sparing Agent in the Treatment of Sarcoidosis: A Systematic Review of the Literature. *Drugs*. 2020; 80(1): 63-76. doi: 10.1007/s40265-019-01234-8.

11. Vorselaars A.D.M., Verwoerd A, van Moorsel C.H.M., *et al.* Prediction of efficacy of mycophenolate mofetil in sarcoidosis. *Respir Med.* 2019; 150: 108-114. doi: 10.1016/j.rmed.2019.03.007.

12. Patel R., Singh A., Kumar V. Miliary Sarcoidosis Masquerading as Tuberculosis in India: A Diagnostic Challenge. *J Clin Diagn Res.* 2022; 16(5): OD01-OD03. doi: 10.7860/JCDR/2022/54321.16345.

13. Kumar S., Verma S., Agarwal P., Gupta N. Atypical Pulmonary Sarcoidosis Mimicking Miliary Tuberculosis: A Case Series from North India. *Cureus.* 2023; 15(8): e44210. doi: 10.7759/cureus.44210.

14. Agarwal R., Aggarwal A.N., Gupta D. Role of Bronchoscopy with Endobronchial Ultrasound and Transbronchial Needle Aspiration in Sarcoidosis Diagnosis in Tuberculosis-Endemic Regions. *Chest*. 2021; 160(4): 1387-1398. doi: 10.1016/j.chest.2021.04.068.

15. Dhooria S., Agarwal R., Aggarwal A.N., *et al.* Diagnostic Yield and Safety of Cryo-Transbronchial Lung Biopsy in Diffuse Lung Disease: A Systematic Review and Meta-Analysis. *Respir Care.* 2020; 65(10): 1567-1580. doi: 10.4187/respcare.07616.