

# Tuberculosis Mimics: A Diagnostic Challenge

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## Introduction

Pulmonary tuberculosis (TB) is a formidable infectious disease that continues to pose a significant global health challenge. A hallmark of TB is its diverse and often atypical presentation on radiological imaging, frequently mimicking a wide array of other pulmonary pathologies. This variability can lead to diagnostic delays and complications, underscoring the need for a comprehensive understanding of its varied manifestations. Recognizing these unusual radiographic findings is crucial for timely diagnosis and effective management, thereby preventing delayed treatment and potential adverse outcomes. Early identification of subtle or non-classic signs on imaging, coupled with a high index of suspicion, is paramount, especially in cases where typical TB symptoms are absent [1].

Disseminated tuberculosis, particularly in its miliary form, can manifest with a diffuse reticulonodular pattern on chest imaging. This pattern can be easily mistaken for other serious conditions such as interstitial lung diseases or metastatic cancer. This presentation underscores the critical importance of considering tuberculosis in the differential diagnosis of diffuse infiltrates, particularly in regions where TB is endemic. Prompt recognition and the timely initiation of anti-TB therapy are vital for improving patient outcomes in these severe presentations [2].

Tuberculosis can, in some instances, present as a solitary pulmonary nodule or even a mass. This presentation poses a significant diagnostic challenge because it frequently mimics primary lung malignancy. This article discusses a specific case where a tuberculoma was initially suspected to be lung cancer, highlighting the essential need for thorough investigation, including microbiological confirmation, to prevent misdiagnosis and inappropriate surgical intervention [3].

Endobronchial tuberculosis, a form of TB that directly affects the airways, can lead to serious complications such as post-obstructive pneumonia and bronchial stenosis. These conditions can present with symptoms that closely resemble asthma or COPD exacerbations, creating diagnostic confusion. This review emphasizes the critical importance of bronchoscopy with biopsy and subsequent microbiological examination in diagnosing endobronchial TB, which is often overlooked when classic pulmonary parenchymal lesions are absent [4].

Tuberculosis also has a propensity to manifest with extrapulmonary involvement, notably pleural effusion. Differentiating TB-related pleural effusions from those caused by other conditions can be challenging. This study highlights the diagnostic utility of pleural fluid analysis for TB, particularly in geographical areas with a high burden of the disease. Early identification of TB as the cause of pleural effusion is critical for initiating appropriate treatment and preventing debilitating complications [5].

Pulmonary tuberculosis can, in rare instances, present as an isolated cavitary lesion without any associated parenchymal infiltrate. This atypical presentation can mimic other cavitary lung diseases, such as fungal infections or lung abscesses.

This case report emphasizes the importance of considering TB even when imaging findings are unusual and the necessity of utilizing microbiological tests for definitive diagnosis [6].

Tuberculomas, a specific form of granulomatous lesion caused by TB, can exhibit calcification. This calcification can lead to confusion, mimicking benign granulomas or even certain types of lung cancer, especially when the tuberculoma is solitary. This article reviews the imaging characteristics of tuberculomas and highlights how varying calcification patterns can complicate their interpretation, underscoring the need for clinical correlation and potentially further investigations [7].

The co-occurrence of tuberculosis and sarcoidosis is a rare but significant clinical scenario that can lead to complex diagnostic challenges. In such cases, imaging findings often overlap considerably, making differentiation difficult. This case report illustrates how a co-existing TB and sarcoidosis presented with atypical infiltrates, complicating the diagnostic pathway. A high index of suspicion coupled with a comprehensive workup are essential in navigating these complex presentations [8].

Tuberculosis can also mimic lymphoproliferative disorders on imaging, particularly when it presents with mediastinal lymphadenopathy and pulmonary nodules. This article discusses a case where TB was initially misdiagnosed as lymphoma, strongly highlighting the critical role of microbiological confirmation over relying solely on imaging features for diagnosis [9].

Asymptomatic pulmonary tuberculosis, characterized by subtle imaging findings, presents a distinct diagnostic challenge. This review emphasizes the importance of recognizing early, non-specific radiological signs in individuals who are at high risk for TB. Early detection, even in the complete absence of overt symptoms, can significantly reduce disease transmission and prevent further disease progression [10].

## Description

Pulmonary tuberculosis (TB) is notorious for its diverse radiological presentations, often masquerading as other pulmonary diseases. This article focuses on several such atypical cases encountered in a tertiary care setting, emphasizing the diagnostic hurdles these presentations can create. Recognizing these unusual manifestations is paramount for achieving timely diagnosis and implementing effective management strategies, thereby averting delayed treatment and potential sequelae. The early identification of subtle or non-classic imaging signs, combined with a vigilant clinical suspicion, is crucial, particularly when typical TB symptoms are not apparent [1].

Disseminated tuberculosis, especially the miliary form, can manifest on chest imaging with a diffuse reticulonodular pattern. This pattern is often confused with

interstitial lung diseases or metastatic cancer. This case report highlights the indispensable role of considering TB in the differential diagnosis of diffuse infiltrates, especially within endemic regions. Rapid recognition and the prompt commencement of anti-TB therapy are vital for enhancing patient outcomes [2].

Tuberculosis can manifest as a solitary pulmonary nodule or even a lung mass. This presentation poses a significant diagnostic quandary as it frequently mimics primary lung malignancy. The article discusses a case where a tuberculoma was initially misdiagnosed as lung cancer, underscoring the critical need for thorough investigation, including microbiological confirmation, to prevent misdiagnosis and unnecessary surgical intervention [3].

Endobronchial tuberculosis, affecting the airways, can lead to secondary complications such as post-obstructive pneumonia and bronchial stenosis. These conditions can present with symptoms that closely resemble exacerbations of asthma or COPD. This review stresses the importance of bronchoscopy with biopsy and microbiological examination for diagnosing endobronchial TB, a form often overlooked when typical pulmonary parenchymal lesions are absent [4].

Tuberculosis can also present with extrapulmonary manifestations, most notably pleural effusion. Differentiating TB-related pleural effusions from other causes of exudative effusions can be challenging. This study emphasizes the diagnostic value of pleural fluid analysis for TB, particularly in regions with a high prevalence of the disease. Early identification of TB as the etiology of pleural effusion is essential for initiating appropriate management and preventing complications [5].

Pulmonary tuberculosis can uncommonly manifest as an isolated cavitary lesion without any associated parenchymal infiltrate. This atypical presentation can mimic other cavitary lung diseases, including fungal infections or lung abscesses. This case report underscores the importance of considering TB even in the presence of atypical imaging findings and the necessity of microbiological tests for definitive diagnosis [6].

Tuberculomas can exhibit calcification, which can lead to their being mistaken for benign granulomas or even certain types of lung cancer, particularly when they present as solitary lesions. This article reviews the imaging characteristics of tuberculomas and illustrates how various calcification patterns can complicate their interpretation, emphasizing the need for clinical correlation and potentially further diagnostic investigations [7].

The co-occurrence of tuberculosis and sarcoidosis is a rare but diagnostically complex scenario, as imaging findings often show significant overlap. This case report demonstrates how a combined TB and sarcoidosis presentation with atypical infiltrates posed diagnostic challenges. A high degree of clinical suspicion and a comprehensive diagnostic workup are imperative in managing such complex cases [8].

Tuberculosis can mimic lymphoproliferative disorders on imaging, especially when it presents with mediastinal lymphadenopathy and pulmonary nodules. This article examines a case where TB was initially misdiagnosed as lymphoma, highlighting the paramount importance of microbiological confirmation over reliance solely on imaging features [9].

Asymptomatic pulmonary tuberculosis with subtle imaging findings represents a diagnostic challenge. This review emphasizes the critical need to recognize early, non-specific radiological signs in individuals at high risk for TB. Early detection, even without overt symptoms, can significantly reduce disease transmission and prevent progression [10].

## Conclusion

Tuberculosis (TB) presents a diagnostic challenge due to its wide range of atypical radiological manifestations that can mimic other pulmonary diseases. These can include diffuse infiltrates mimicking interstitial lung diseases or metastatic cancer, solitary nodules or masses resembling lung cancer, and endobronchial TB presenting as asthma or COPD exacerbations. Extrapulmonary TB, such as pleural effusions, also requires careful differentiation. Rare presentations like isolated cavitary lesions or tuberculomas with calcification add to the complexity. Co-occurrence with conditions like sarcoidosis or mimicry of lymphoproliferative disorders further complicate diagnosis. Early recognition of subtle imaging signs and microbiological confirmation are crucial, especially in high-risk individuals and even in asymptomatic cases, to ensure timely and effective treatment.

## Acknowledgement

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## Conflict of Interest

None.

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