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Progressive Constitutional Symptoms and Pleural Effusion Revealing Disseminated Tuberculosis Mimicking Malignancy

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Abstract

Tuberculosis (TB) remains a leading cause of infectious morbidity worldwide and frequently presents with non-specific constitutional symptoms and radiological findings that may mimic malignancy. Pleural tuberculosis is a common extrapulmonary manifestation, typically characterized by lymphocyte-predominant exudative effusions and elevated adenosine deaminase (ADA) levels. We report the case of a 35-year-old male presenting with progressive constitutional symptoms, including fevers, drenching night sweats, and significant weight loss following a recent viral illness. Cross-sectional imaging demonstrated a large right-sided pleural effusion with associated pulmonary abnormalities and intra-abdominal findings suggestive of peritoneal carcinomatosis. However, pleural fluid analysis revealed a lymphocyte-predominant exudate with elevated ADA, and molecular testing confirmed Mycobacterium tuberculosis infection. The patient was treated with standard first-line anti-tuberculous therapy with good clinical response. This case highlights the protean manifestations of tuberculosis and its capacity to closely mimic malignancy. It underscores the importance of maintaining diagnostic vigilance, integrating biochemical and microbiological data, and applying contemporary guideline-directed therapy.

Keywords: Tuberculosis; Pleural effusion; Adenosine deaminase; Disseminated tuberculosis; Peritoneal tuberculosis; Malignancy mimic

Introduction

Tuberculosis, caused by Mycobacterium tuberculosis, remains a major global health challenge despite advances in diagnosis and treatment. While pulmonary involvement is most common, extrapulmonary tuberculosis accounts for a substantial proportion of cases and often presents with non-specific clinical features that may delay diagnosis. Pleural tuberculosis is one of the most frequent forms of extrapulmonary TB and typically manifests as a unilateral pleural effusion accompanied by systemic symptoms such as fever, night sweats, and weight loss. Radiological findings may be heterogeneous, and in some cases TB closely mimics malignancy, particularly when associated with pleural thickening or intra-abdominal involvement such as omental caking or peritoneal nodularity. The diagnostic overlap between tuberculosis and malignancy represents a well-recognised clinical challenge. Furthermore, evolving treatment paradigms—including shorter-course regimens—necessitate a contemporary understanding of TB management. We describe a case of disseminated tuberculosis presenting with pleural and peritoneal involvement initially suggestive of malignancy, highlighting both diagnostic and therapeutic considerations [1-8].

Case Presentation

A 35-year-old male was reviewed following a recent hospital admission for a febrile illness associated with a right-sided pleural effusion. He reported a five-month history of progressive constitutional symptoms beginning after a viral illness consistent with dengue fever. His symptoms evolved from intermittent fevers to persistent pyrexia associated with drenching night sweats, malaise, and increasing reliance on antipyretics. Over the preceding months, he developed worsening systemic symptoms

including rigors, marked fatigue, and functional decline. He reported unintentional weight loss of approximately 16 kg (84 kg to 68 kg), accompanied by anorexia. He denied significant respiratory symptoms, including cough, dyspnoea, or haemoptysis, and reported no gastrointestinal or genitourinary complaints (Figures 1,2).

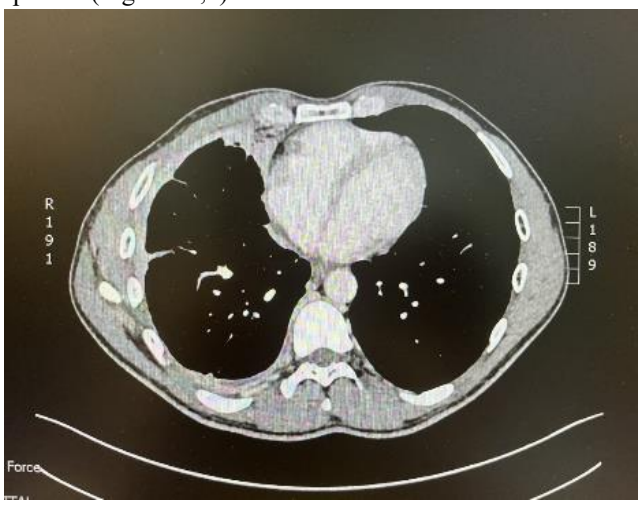

***Figure 1**: Computed tomography (CT) of the chest demonstrated a right-sided pleural effusion with associated right lower lobe atelectasis.*

***Figure 2**: CT imaging of the abdomen and pelvis revealed extensive omental and peritoneal thickening, raising concern for peritoneal carcinomatosis.*

Investigations

Pleural Fluid Analysis

Diagnostic thoracentesis demonstrated an exudative effusion with lymphocyte predominance and a markedly elevated ADA level of 58 U/L. Cytology and flow cytometry did not identify malignant cells.

Microbiological Testing

Molecular testing using GeneXpert detected Mycobacterium tuberculosis DNA with no evidence of rifampicin resistance. Subsequent culture confirmed M. tuberculosis complex, establishing the diagnosis of disseminated tuberculosis involving the pleura and peritoneum.

Radiological Findings

Cross-sectional imaging demonstrated a large right-sided pleural effusion with associated pulmonary abnormalities and intra-abdominal features including peritoneal thickening and nodularity, initially raising strong suspicion for peritoneal carcinomatosis.

Diagnosis

Disseminated tuberculosis with pleural and peritoneal involvement, initially mimicking malignancy.

Management

Anti-Tuberculous Therapy

The patient was commenced on standard first-line therapy for drug-susceptible tuberculosis, consisting of:

- Rifampicin
- Isoniazid
- Pyrazinamide
- Ethambutol

This regimen follows the conventional 6-month treatment protocol (2HRZE/4HR), which remains the standard of care in Australia and is recommended for extrapulmonary and disseminated TB. Adjunctive pyridoxine (vitamin B6) was initiated to reduce the risk of isoniazid-induced peripheral neuropathy.

Contemporary Context

Although shorter 4-month rifapentine–moxifloxacin regimens have emerged in recent WHO guidelines, their use remains limited to carefully selected patients with uncomplicated pulmonary TB. Given the disseminated nature of disease in this case, the standard 6-month regimen was considered most appropriate and guideline-concordant.

Pleural Management

The large symptomatic pleural effusion was managed with insertion of an intercostal catheter, resulting in effective drainage and symptomatic improvement. The catheter was subsequently removed following clinical and radiographic resolution.

Monitoring and Safety

The patient was enrolled in a structured monitoring program including:

- Serial liver function tests (to detect hepatotoxicity)
- Visual assessment (for ethambutol-related optic neuropathy)
- Neurological monitoring (for peripheral neuropathy)
- Clinical review for treatment response and adherence

Public Health Measures

Appropriate public health protocols were implemented, including:

- Notification to local TB control services
- Contact tracing and screening of close contacts
- Consideration of adherence strategies, including directly observed therapy where required

Supportive Care

Supportive measures included nutritional optimisation, graded return to activity, and counselling regarding strict adherence to therapy to prevent relapse and drug resistance.

Follow-Up Strategy

A structured follow-up plan was implemented, including:

- Regular clinical review
- Serial imaging (CT chest, abdomen, pelvis) to assess treatment response
- Ongoing specialist supervision to guide treatment duration and monitor complications

Outcome and Follow-Up

Following initiation of therapy, the patient demonstrated significant clinical improvement, including resolution of fevers and gradual recovery of functional status. Mild fatigue and intermittent night sweats persisted early in the treatment course. On follow-up, he remained haemodynamically stable. Clinical examination demonstrated reduced air entry over the right hemithorax and mild abdominal tenderness without lymphadenopathy. Ongoing management focused on monitoring for drug-related adverse effects and radiological response to therapy.

Discussion

This case highlights the diagnostic and therapeutic challenges posed by disseminated tuberculosis, particularly when clinical and radiological findings closely mimic malignancy. The patient presented with classical constitutional symptoms; however, these features are non-specific and overlap significantly with malignancy, particularly lymphoma and metastatic disease. The absence of prominent respiratory symptoms further contributed to diagnostic uncertainty. Radiologically, the coexistence of pleural effusion and peritoneal abnormalities raised strong suspicion for peritoneal carcinomatosis. Tuberculosis remains a well-recognised "great mimicker," capable of producing imaging findings indistinguishable from malignancy due to granulomatous inflammation and serosal involvement. Pleural fluid analysis played a pivotal role. A lymphocyte-predominant exudate with elevated ADA (>40 U/L) has high diagnostic accuracy for tuberculous pleuritis in the appropriate clinical context. Definitive diagnosis was established through rapid molecular testing (GeneXpert), enabling early initiation of therapy. This aligns with contemporary practice, where nucleic acid amplification tests have significantly reduced diagnostic delays. From a therapeutic perspective, management of drug-susceptible TB remains centred on multidrug therapy. The standard 6-month regimen continues to demonstrate excellent outcomes and remains the preferred approach in disseminated disease. Emerging shorter-course regimens offer promise but require careful patient selection and are not yet widely adopted in extrapulmonary TB.

Effective management also requires:

- Structured monitoring for drug toxicity
- Ensuring adherence to therapy
- Integration of public health measures to limit transmission

This case underscores the importance of avoiding diagnostic anchoring and highlights the need for a systematic, multidisciplinary approach integrating clinical, biochemical, radiological, and microbiological data.

Conclusion

Disseminated tuberculosis may present with non-specific systemic symptoms and radiological findings that closely mimic malignancy, posing significant diagnostic challenges.

This case emphasises:

- The importance of maintaining a broad differential diagnosis
- The diagnostic value of pleural fluid ADA
- The necessity of microbiological confirmation
- The role of guideline-directed multidrug therapy

Early recognition, adherence to contemporary treatment protocols, and integration of public health measures are essential to optimise outcomes and prevent disease progression and transmission.

Ethics & Consent

Ethics Approval: Not required for single case reports as per institutional policy.

Consent: Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Competing Interests: The authors declare that they have no competing interests.

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Authors' Contributions: All authors contributed to the clinical care of the patient, conception of the report, and drafting of the manuscript. All authors read and approved the final manuscript.

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