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Pulmonary tuberculosis mimicking a hilar mass in an HIV-positive patient with multiple comorbidities: A diagnostic challenge

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Abstract

Context

Pulmonary tuberculosis (TB) remains a significant diagnostic challenge in HIV-positive patients due to the overlapping presentations of infectious, neoplastic, and inflammatory diseases. This complexity is exacerbated by the presence of multiple comorbidities, such as diabetes mellitus and hypertension, which can further alter the clinical picture.

Aims

To describe the clinical presentation, diagnostic process, and management of a complex case of pulmonary tuberculosis in an HIV-positive patient, highlighting the role of molecular diagnostics and a multidisciplinary approach.

Results

A 58-year-old female presented with a persistent cough, hemoptysis, weight loss, and fever. Initial imaging revealed a left hilar mass with mediastinal lymphadenopathy, raising suspicion of malignancy. Bronchoscopy was inconclusive. A line probe assay (LPA) confirmed pulmonary tuberculosis. The patient was successfully treated with anti-tuberculosis therapy (ATT), and her ART was adjusted to prevent immune reconstitution inflammatory syndrome (IRIS). The patient's comorbid diabetes was managed concurrently.

Conclusion

Pulmonary tuberculosis should be considered in the differential diagnosis of pulmonary lesions in HIV-positive patients, even when imaging suggests malignancy. Molecular diagnostics, such as LPA, are critical in confirming TB in complex cases. A multidisciplinary approach is essential in managing such patients, particularly in the presence of comorbid conditions like diabetes.

Keywords: Pulmonary tuberculosis, HIV, hilar mass, line probe assay, immune reconstitution inflammatory syndrome (IRIS), diabetes mellitus, comorbidities

Introduction

Pulmonary tuberculosis (TB) continues to be a major global health issue, especially in patients with compromised immune systems, such as those living with HIV. In HIV-positive individuals, TB often presents atypically, leading to diagnostic challenges. Comorbidities such as diabetes mellitus further complicate the clinical picture by altering immune responses and exacerbating the severity of the infection. The diagnostic approach in these patients must consider not only infectious causes but also neoplastic and inflammatory processes, particularly when radiologic findings, such as hilar masses, are present. Here, we describe a case in which an HIV-positive patient with multiple comorbidities presented with a pulmonary lesion that mimicked malignancy but was eventually diagnosed as pulmonary tuberculosis through molecular diagnostics.

Case presentation

A 58-year-old female, with a 10-year history of HIV (well-controlled on antiretroviral therapy [ART]), diabetes mellitus, and systemic hypertension, presented with a 4-month history of persistent cough, hemoptysis, intermittent fever, and weight loss of 11 kg. The patient had no significant past history of smoking or previous respiratory infections. Physical examination revealed bronchial breath sounds over the left lower lobe, but no other significant findings.

Laboratory findings

- Hemoglobin: 10 g/dL
- WBC: 9,000/mm³
- Platelets: 314,000/mm³
- Urea: 14 mg/dL
- Creatinine: 1.1 mg/dL
- CD4 Count: 480 cells/µL

Imaging Studies

- **Chest X-ray:** Revealed a left hilar mass and mediastinal lymphadenopathy.
- **CT Chest:** Confirmed a left hilar mass obstructing the left bronchus with associated mediastinal lymphadenopathy and ground-glass opacities in the left lower lobe.

Bronchoscopy

Bronchoscopy was performed, revealing acute inflammatory changes with necrotic debris in the left bronchus. Cytology was negative for malignancy, and BAL GeneXpert was negative for *Mycobacterium tuberculosis*. However, histopathological analysis showed acute-on-chronic inflammation, but no granulomas were present.

Given the inconclusive initial findings and the patient's HIV-positive status, a line probe assay (LPA) was performed, which confirmed rifampicin-sensitive Mycobacterium tuberculosis, leading to a final diagnosis of pulmonary tuberculosis.

Management

The patient was started on a standard anti-tuberculosis therapy (ATT) regimen, consisting of isoniazid, rifampicin, pyrazinamide, and ethambutol, as per the **Directly Observed Treatment Short-Course (DOTS)** strategy. Due to concerns regarding **immune reconstitution inflammatory syndrome (IRIS)**, ART was temporarily withheld during the initial phase of ATT.

The patient's diabetes was managed with insulin and metformin to maintain adequate glycemic control during her treatment.

Follow-up

After one month of treatment, the patient showed clinical improvement, with resolution of her cough and fever. Follow-up imaging two months later demonstrated a marked reduction in the hilar mass and resolution of the mediastinal lymphadenopathy. ART was cautiously reintroduced after the patient stabilized on ATT, and glycemic control was maintained throughout.

Discussion

Pulmonary lesions in HIV-positive patients often present a diagnostic challenge due to the wide range of potential differential diagnoses, including infections such as tuberculosis, malignancies like lymphoma, and inflammatory conditions. In this case, the initial radiographic findings of a left hilar mass with mediastinal lymphadenopathy raised concerns for malignancy. However, the use of **molecular diagnostics**, specifically the line probe assay (LPA), allowed for the definitive diagnosis of **pulmonary tuberculosis** in this patient, despite the negative results from conventional bronchoscopy and cytology.

Diabetes mellitus in HIV-positive individuals further complicates the management of TB. Diabetes is known to impair immune responses, increasing the risk and severity of TB. Managing both infections and chronic conditions, such as diabetes, requires a well-coordinated, multidisciplinary approach. Temporarily halting ART in this patient to prevent **IRIS** was essential in avoiding this potentially life-threatening complication. This case also highlights the importance of individualized treatment plans in immunocompromised patients with multiple comorbidities.

Conclusion

This case report highlights the diagnostic complexities of managing pulmonary lesions in HIV-positive patients, particularly when imaging findings suggest malignancy. Molecular diagnostics such as the line probe assay (LPA) are invaluable tools for confirming tuberculosis in cases where traditional methods yield inconclusive results. A multidisciplinary approach, involving close collaboration between infectious disease specialists, pulmonologists, and endocrinologists, is essential for optimizing patient outcomes, especially in those with comorbid conditions like diabetes.

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