

## Case Report



# Pulmonary Cryptococcosis with Disseminated Involvement in Advanced HIV: A Tuberculosis Mimic from a TB-Endemic Region

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## Abstract

**Background:** Cryptococcosis is a life-threatening opportunistic fungal infection predominantly affecting individuals with advanced HIV infection. In tuberculosis (TB)-endemic countries, pulmonary and disseminated cryptococcosis may closely resemble TB, resulting in delayed diagnosis and inappropriate therapy. **Case Presentation:** A 30-year-old man presented with chronic cough, fever, weight loss, diarrhea, and generalized lymphadenopathy. He was newly diagnosed with advanced HIV infection (CD4 count 30 cells/mm<sup>3</sup>). Imaging revealed mediastinal lymphadenopathy and bilateral consolidations. Sputum potassium hydroxide preparation, supraclavicular lymph node biopsy, bronchoalveolar lavage cytology, and serum cryptococcal antigen testing confirmed disseminated cryptococcosis involving pulmonary, nodal, and ocular sites. Cerebrospinal fluid examination was normal. The patient improved significantly following induction therapy with liposomal amphotericin B plus flucytosine. **Conclusion:** Disseminated cryptococcosis can closely mimic tuberculosis in high TB-burden settings. Early fungal evaluation and prompt antifungal therapy are critical to reducing morbidity and mortality in advanced HIV infection.

**Keywords:** Cryptococcosis, HIV, Disseminated fungal infection, Tuberculosis mimic, Lymphadenopathy, Pulmonary infection.

## Introduction

Cryptococcosis is caused primarily by *Cryptococcus neoformans* and *Cryptococcus gattii*, encapsulated yeasts that cause opportunistic infections in immunocompromised hosts. Globally, cryptococcal meningitis accounts for approximately 15% of AIDS-related deaths, with an estimated 220,000 cases annually among people living with HIV/AIDS (PLHA) <sup>[1]</sup>.

Pulmonary infection occurs following inhalation of fungal spores and may remain localized or disseminate hematogenously, particularly in patients with CD4 counts <100 cells/mm<sup>3</sup> <sup>[2]</sup>. In tuberculosis-endemic regions, pulmonary and nodal cryptococcosis may closely resemble tuberculosis clinically and radiologically, leading to delayed diagnosis and inappropriate empirical anti-tubercular therapy <sup>[3]</sup>.

We report a case of disseminated cryptococcosis presenting with pulmonary, lymphatic, and ocular involvement in advanced HIV infection.

## Case Presentation

A 30-year-old male, tile cutter by occupation and chronic alcoholic for 10 years, presented with a 4-month history of productive cough, intermittent evening rise of fever with chills, chronic diarrhea, anorexia, generalized weakness, and weight loss. There was no significant prior medical history.

On examination he had right supraclavicular lymphadenopathy along with bilateral basal crackles on auscultation.

Laboratory Findings showed severe anemia (chronic with B12 deficiency), mild acute kidney injury (resolved with supportive care). His HIV serology came back Positive with a CD4 count of 30 cells/mm<sup>3</sup>. His sputum AFB and CBNAAT were negative. Sputum KOH showed budding yeast cells.

## Radiology

Contrast-enhanced CT thorax revealed (**Figure 1**): Multiple enlarged mediastinal and right hilar lymph nodes (largest 4.8 × 2.5 cm) along with bilateral lower lobe consolidations & minimal bilateral pleural effusion.

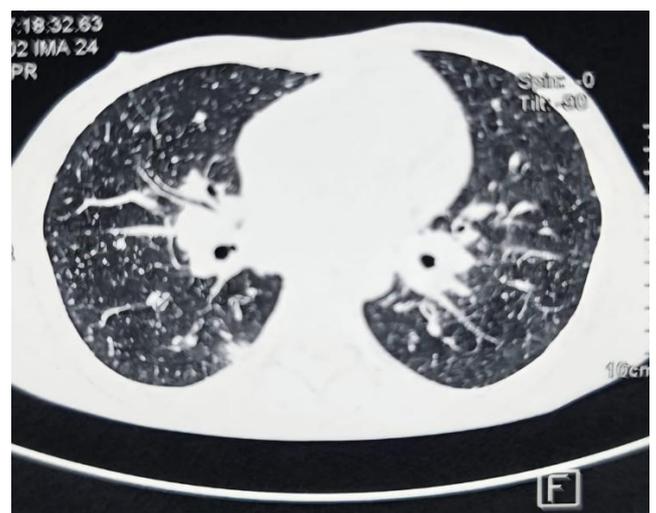
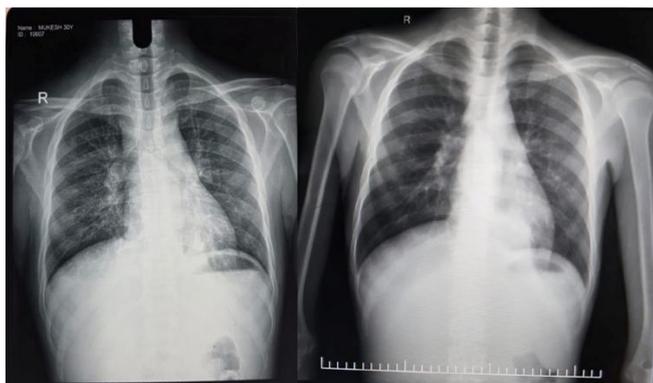


Figure 1: Contrast-Enhanced CT Thorax

Axial contrast-enhanced CT image demonstrating multiple enlarged mediastinal and right hilar lymph nodes, along with bilateral interstitial nodular changes.

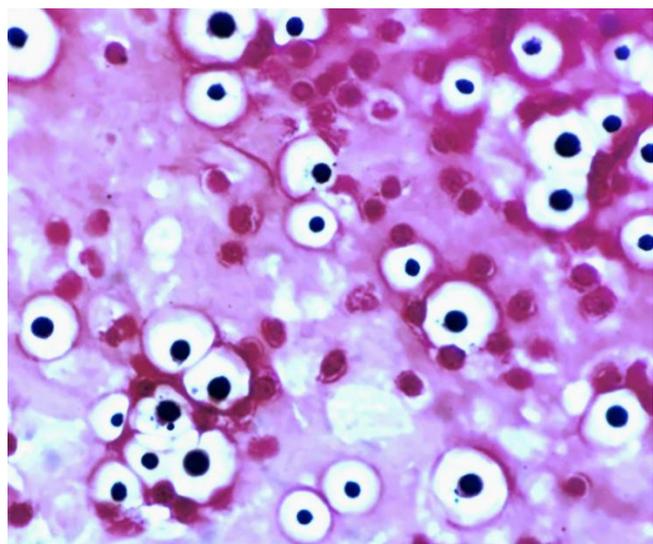


**Figure 2: Chest Radiograph (Pre and post treatment Postero-anterior View)**

Chest X-ray showing bilateral lower zone opacities with ill-defined margins, consistent with consolidation. No obvious cavitation noted. Post treatment Chest Xray shows improvement.

### Diagnostic Confirmation

- Supraclavicular lymph node biopsy: India ink positive; budding yeast cells
- Histopathology: Fungal infection with encapsulated yeast forms
- Bronchoalveolar lavage cytology: Positive for cryptococcus
- Serum cryptococcal antigen: Positive
- Fundus examination: Multiple choroid tubercles
- CSF examination: Normal



**Figure 3: Bronchoalveolar Lavage Cytology**

Cytology smear showing round to oval budding yeast cells with thick capsule suggestive of cryptococcal infection.

### Final Diagnosis

Advanced HIV infection with disseminated cryptococcosis (pulmonary, nodal, ocular) along with severe anemia and oral candidiasis.

The patient was initiated on induction therapy with Liposomal amphotericin B (150 mg IV daily) with Flucytosine (1250 mg four times daily).

He showed significant clinical improvement and was discharged on consolidation antifungal therapy with planned antiretroviral initiation as per guidelines.

## Discussion and Literature Review

Cryptococcosis predominantly affects immunocompromised individuals, especially PLHA with CD4 counts below 100 cells/mm<sup>3</sup> [2]. The disease spectrum ranges from asymptomatic pulmonary colonization to disseminated infection involving CNS, lymph nodes, skin, and eyes.

### Epidemiology

The global burden of HIV-associated cryptococcosis remains substantial despite ART availability [1]. Mortality is particularly high in low- and middle-income countries due to delayed diagnosis and limited access to optimal antifungal therapy.

### Pathogenesis

Inhaled spores establish primary pulmonary infection. In advanced immunosuppression, impaired Th1-mediated immunity allows hematogenous dissemination [2,4]. Chronic alcoholism may further impair immune defenses, increasing susceptibility.

### Pulmonary Manifestations

Pulmonary cryptococcosis in immunocompromised hosts commonly presents with multiple nodules, segmental or lobar consolidation, cavitation, pleural effusion, mediastinal lymphadenopathy [5].

These findings often overlap with pulmonary tuberculosis, particularly in endemic regions.

### Lymph Node Involvement

Cryptococcal lymphadenitis is uncommon but documented. It may mimic lymphoma or tuberculous lymphadenitis. Histopathology typically demonstrates encapsulated yeast forms visible with India ink or mucicarmine staining [6].

### Ocular Involvement

Ocular manifestations result from hematogenous dissemination and include choroiditis, papilledema, cranial nerve palsies, and retinitis [4]. The presence of choroidal lesions in our patient suggested systemic spread despite normal CSF findings.

### Diagnosis

Serum cryptococcal antigen (CrAg) testing is highly sensitive and specific and is recommended for screening PLHA with CD4 <100 cells/mm<sup>3</sup> [7]. Tissue diagnosis remains crucial in TB-endemic settings where empirical ATT may otherwise be initiated.

### Treatment

Current WHO and IDSA guidelines recommend induction therapy with liposomal amphotericin B plus flucytosine, followed by high-dose fluconazole consolidation [7,8]. Combination therapy significantly reduces mortality compared to monotherapy. Timing of ART initiation should balance benefits against the risk of immune reconstitution inflammatory syndrome [9].

### Tuberculosis Mimicry

In TB-endemic settings, chronic cough, fever, weight loss, lymphadenopathy, and radiological consolidation strongly bias clinicians toward tuberculosis. Misdiagnosis can delay antifungal therapy and increase mortality [3]. This case underscores the importance of fungal evaluation in advanced HIV with atypical or smear-negative TB presentations.

### Learning Points

- Disseminated cryptococcosis can closely mimic tuberculosis in TB-endemic countries.
- PLHA with CD4 <100 cells/mm<sup>3</sup> should undergo routine serum cryptococcal antigen screening.
- Lymphadenopathy and ocular lesions suggest hematogenous dissemination.
- Early combination antifungal therapy significantly improves outcomes.
- Tissue diagnosis is essential before empirical anti-tubercular therapy in advanced HIV.

### Conclusion

Disseminated cryptococcosis remains a significant diagnostic challenge in tuberculosis-endemic regions. In patients with advanced HIV presenting with chronic respiratory symptoms and lymphadenopathy, fungal infections must be actively considered. Early diagnosis and guideline-directed antifungal therapy are critical to improving survival.

### Declarations

### Acknowledgements

None

### Conflict of interest

None

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None

### Contributors

Dr Palash Agarwal, Dr Abhinav Choubey, Dr Alkesh Khurana

### Ethical Clearance

Not applicable

### Trial details

Not applicable

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