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# Endobronchial Tuberculosis Presenting as Chronic Bronchitis: A Diagnostic Challenge

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## Introduction

Endobronchial Tuberculosis (EBTB) is a rare but significant form of tuberculosis that affects the tracheobronchial tree. It often masquerades as other respiratory conditions such as chronic bronchitis, asthma, or malignancy, making diagnosis particularly challenging. EBTB is most commonly observed in young adults and females and is frequently underdiagnosed due to its non-specific clinical and radiological findings. The hallmark of EBTB is delayed diagnosis leading to complications such as bronchial stenosis and persistent pulmonary symptoms. Early identification through bronchoscopy and microbiological confirmation is essential for prompt initiation of therapy and prevention of irreversible airway damage. This case emphasizes the diagnostic complexity of EBTB when it mimics common pulmonary conditions like chronic bronchitis. This case illustrates the importance of considering tuberculosis in the differential diagnosis of patients with chronic respiratory symptoms, especially in endemic areas. The mimicry of EBTB with chronic bronchitis underscores the limitations of empiric treatment without thorough workup [1].

## Description

Endobronchial Tuberculosis (EBTB) remains a diagnostic challenge due to its diverse clinical presentations and frequent overlap with common respiratory disorders. Chronic bronchitis, particularly in smokers, is often diagnosed clinically without detailed imaging or bronchoscopy, which may lead to misdiagnosis or delayed treatment. Persistent respiratory symptoms unresponsive to standard therapy should prompt further evaluation, including high-resolution imaging and bronchoscopy. Computed Tomography (CT) can reveal features such as bronchial narrowing or mucosal irregularities, but definitive diagnosis typically requires bronchoscopic visualization and microbiological confirmation. EBTB is classified into various subtypes (e.g., ulcerative, granular, caseating) based on bronchoscopic findings, each with varying risks of airway stenosis. Early diagnosis and timely initiation of anti-tubercular therapy are critical to prevent complications. Delayed intervention may result in progressive bronchial obstruction necessitating surgical or interventional procedures such as bronchial dilatation or stenting [2].

Bronchoscopy remains the gold standard for diagnosis, enabling direct visualization, sampling, histopathological examination and potential therapeutic interventions. Periodic bronchoscopic evaluation during therapy can help monitor mucosal healing and detect early signs of fibrosis or stenosis. From a pathophysiological standpoint, EBTB involves direct invasion of the bronchial mucosa by Mycobacterium tuberculosis, resulting in mucosal ulceration, granulation tissue formation and eventually fibrosis. This process can severely impair airflow, lead to bronchiectasis and cause recurrent infections. The bronchoscopic appearance varies with disease activity and stage, reinforcing the need for individualized management strategies. While the use of corticosteroids as an adjunctive therapy to reduce inflammation and prevent fibrosis remains controversial, it may be considered in selected cases with high risk of stenosis. In addition to clinical care, the social and epidemiological dimensions of EBTB should not be overlooked. Patients are often from vulnerable populations with limited access to healthcare. Chronic symptoms such as cough and hemoptysis may lead to stigmatization, further delaying diagnosis. Public health measures including contact tracing, screening of close contacts and smoking cessation advocacy are crucial components of a comprehensive approach to TB control [3].

Smoking, in particular, worsens TB outcomes by impairing local immune defenses and should be addressed proactively. As tuberculosis remains a global health threat, particularly in high-burden regions, improving the diagnosis and management of EBTB is a critical priority. Future directions should include the development of non-invasive and rapid diagnostic tools that can accurately identify endobronchial involvement, especially in resource-limited settings where access to bronchoscopy is restricted. Advances in imaging modalities, such as artificial intelligence-assisted CT interpretation, may also enhance early detection. Standardization of classification systems and treatment protocols for the various bronchoscopic subtypes of EBTB would help guide clinicians in risk stratification and therapeutic decision-making. Large-scale prospective studies are needed to better define the role of adjunctive corticosteroids and other anti-fibrotic agents in preventing long-term airway complications. Furthermore, research into host immune responses and genetic susceptibility may open avenues for targeted therapies and personalized medicine approaches. In parallel, public health efforts must focus on integrating TB control strategies with broader chronic disease and smoking cessation programs to address underlying risk factors and improve patient outcomes. Enhanced collaboration between clinicians, microbiologists, radiologists and public health professionals will be essential for tackling EBTB comprehensively. Ultimately, combining clinical innovation with health system strengthening and community engagement holds the key to reducing the burden of this often-overlooked form of tuberculosis [4-5].

## Conclusion

Endobronchial tuberculosis is a rare but serious manifestation of pulmonary TB that can easily be misdiagnosed as chronic bronchitis or other obstructive airway diseases. This case highlights the need for a high index of suspicion in patients with persistent respiratory symptoms unresponsive to conventional therapy. Early bronchoscopy and microbiological testing are essential for diagnosis. Timely initiation of anti-tubercular therapy can lead to full resolution and prevent airway damage. In TB-endemic regions, clinicians should remain vigilant about the protean manifestations of tuberculosis and consider EBTB in patients with chronic cough and localized bronchial involvement.

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## Conflict of Interest

None.

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