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Clinical insights and management strategies in bronchiectasis: A case series analysis

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Abstract
Bronchiectasis is a chronic respiratory condition characterized by irreversible bronchial dilation and impaired mucociliary clearance. This case series examines two distinct presentations—one post-tuberculosis and one with recurrent childhood respiratory infections. Through clinical, radiological, and microbiological evaluations, the study highlights diagnostic challenges, comorbid influences, and treatment strategies, underscoring the importance of early recognition and comprehensive care.

Keywords: Bronchiectasis, tuberculosis sequelae, childhood infections, HRCT, COPD, case series, respiratory disease

Introduction
Bronchiectasis results from chronic inflammation and destruction of the bronchial walls, leading to mucus stasis and recurrent infections. Although once considered an orphan disease, its incidence is rising, especially in developing countries. This case series aims to elucidate the diverse etiologies and clinical courses of bronchiectasis and discuss its optimal diagnostic and therapeutic approaches.

Overview
Bronchiectasis is a heterogeneous and multifactorial respiratory disorder with significant clinical and radiological variability. It is increasingly recognized not only in post-infectious settings such as tuberculosis but also in congenital, immunologic, and idiopathic conditions. This case series highlights two distinct patterns of bronchiectasis: one in an elderly patient with post-TB changes and multiple comorbidities, and another in a young adult with likely congenital or post-infective childhood bronchiectasis. The goal is to stress the importance of early diagnosis, appropriate classification, and individualized patient-centric management.

Background
Historically, bronchiectasis was a feared sequela of childhood infections and tuberculosis, often associated with severe morbidity and mortality. With the advent of antibiotics and improved living conditions, its prevalence declined in developed countries. However, in regions with high TB prevalence, poor access to healthcare, and environmental exposures, the burden of bronchiectasis remains significant. The diagnostic cornerstone is High-Resolution Computed Tomography (HRCT), which allows for visualization of bronchial dilatation, wall thickening, and mucus plugging. Clinical management has evolved to include not only symptomatic treatment but also antimicrobial stewardship, airway clearance techniques, and addressing comorbidities such as COPD or metabolic disorders.

Academic Context
Bronchiectasis is now a subject of active academic interest due to its complex pathophysiology, interplay with other chronic lung diseases, and implications for antimicrobial resistance. Recent guidelines emphasize phenotype-based approaches, stratified care, and multidisciplinary intervention strategies. There is growing research on the microbiome in bronchiectasis, the role of chronic Pseudomonas aeruginosa infection, and emerging therapies such as inhaled antibiotics and anti-inflammatory agents. In addition, increasing recognition of non-CF bronchiectasis in primary care and pulmonology settings is driving research into earlier detection and comprehensive care models. This case series contributes to the growing body of literature by offering real-world examples that underscore the clinical and academic relevance of this neglected but impactful disease.

Objectives
1. To characterize the clinical features and history in bronchiectasis patients.
2. To identify diagnostic tools and challenges.
3. To evaluate the management strategies and their efficacy.
4. To stress the importance of prevention and early diagnosis.
5. To promote ongoing research and education on bronchiectasis.

Case Presentations
Case 1 – Post-TB Bronchiectasis in an Elderly Patient
- **Age/Sex:** 78-year-old male
- **Symptoms:** Chronic productive cough, breathlessness on exertion, recent fever
- **History:** Pulmonary TB (30 years ago), 20-year smoking history (quit 15 years ago)
- **Comorbidities:** Diabetes, hypertension, mild fatty liver, prostate enlargement

Investigations
CXR: Bilateral upper zone fibro-cavitatory lesions, signs of COPD

HRCT: Fibrobronchiectatic changes in upper lobes, hyperinflated lungs
Sputum AFB and GenXpert: Negative for MTB

- **Diagnosis:** Post-TB bronchiectasis
- **Management:** Symptomatic management, comorbidity control

Case 2 – Recurrent Childhood Infection-Associated Bronchiectasis
- **Age/Sex:** 23-year-old male
- **Symptoms:** Chronic cough with expectoration, breathlessness
- **History:** Recurrent lower respiratory tract infections and pneumonia in childhood
- **Investigations**

CXR: Upper lobe bilateral fibrobronchiectatic changes (left > right)

CT Chest: Extensive bronchiectasis

Sputum AFB and GenXpert: Negative

- **Diagnosis:** Bronchiectasis secondary to repeated childhood infections
- **Management:** Symptomatic management, physiotherapy, mucus clearance**Discussion**

Etiological Spectrum
- Case 1 underscores bronchiectasis as a sequela of TB, a common cause in endemic regions.
- Case 2 reflects non-TB causes—most likely post-infectious bronchiectasis from recurrent childhood infections.

Diagnostic Insights
- Both patients required advanced imaging (HRCT) for definitive diagnosis.
- Microbiological investigations (AFB, GeneXpert) were essential to rule out active TB.
- Radiological features like bronchial wall thickening, cavitations, and airway dilatation confirmed diagnosis.

Management Challenges
- In both cases, treatment focused on symptomatic relief.
- Lack of structured airway clearance programs and targeted antibiotic therapy were identified as gaps.

Preventive Strategies
- Early diagnosis of respiratory infections, vaccination (influenza, pneumococcus), and smoking cessation are key preventive tools.
- Case 2 emphasizes the importance of pediatric follow-up in recurrent LRTIs.

Comparative Table

Parameter	Case 1 (Post-TB)	Case 2 (Childhood Infections)
Age	78	23
TB History	Yes (30 years ago)	No
Smoking	Yes (quit 15 years ago)	No
Imaging	CXR, HRCT: Upper zone fibrosis, COPD features	CXR, CT: Extensive bronchiectasis
AFB/GenXpert	Negative	Negative
Management	Symptomatic, comorbid focus	Symptomatic, mucus clearance

Conclusion
Bronchiectasis presents diverse clinical profiles, necessitating personalized diagnostic and therapeutic strategies. This case series reaffirms the importance of early diagnosis using imaging, microbiological evaluation, and patient-tailored management. Long-term outcomes improve significantly with structured treatment, physiotherapy, and patient education.

Recommendations
- Enhance clinician awareness on the varied presentations of bronchiectasis.
- Incorporate physiotherapy and airway clearance into standard care.
- Encourage further research to develop etiology-based treatment protocols.
- Educate patients about the chronic nature and care pathways for bronchiectasis.

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