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The Bronchus that Told Two Stories: Adenoid Cystic Carcinoma with a Tubercular Twist

Dr. Manas Bhanushali, Dr. Muskan Athwani, Dr. Girija Nair, Dr. Jignesh Patel

***Corresponding Author:**
Dr. Manas Bhanushali

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Abstract

Adenoid cystic carcinoma of the tracheobronchial tree is a rare malignancy arising from submucosal glands and is characterized by slow growth, submucosal spread, and nonspecific respiratory symptoms that frequently mimic benign airway diseases. Because of its indolent course and misleading presentation, diagnosis is often delayed until significant airway obstruction occurs. Early recognition is crucial, as timely bronchoscopic evaluation and histopathological confirmation allow appropriate staging and institution of definitive therapy, which can significantly influence prognosis and long-term outcomes. In regions with a high burden of tuberculosis, incidental detection of mycobacterial DNA in respiratory specimens may create diagnostic uncertainty and complicate management decisions. Awareness of this rare tumor entity, combined with a systematic approach to unexplained central airway symptoms, is essential to avoid misdiagnosis and ensure prompt, targeted treatment.

Keywords: NIL

Introduction

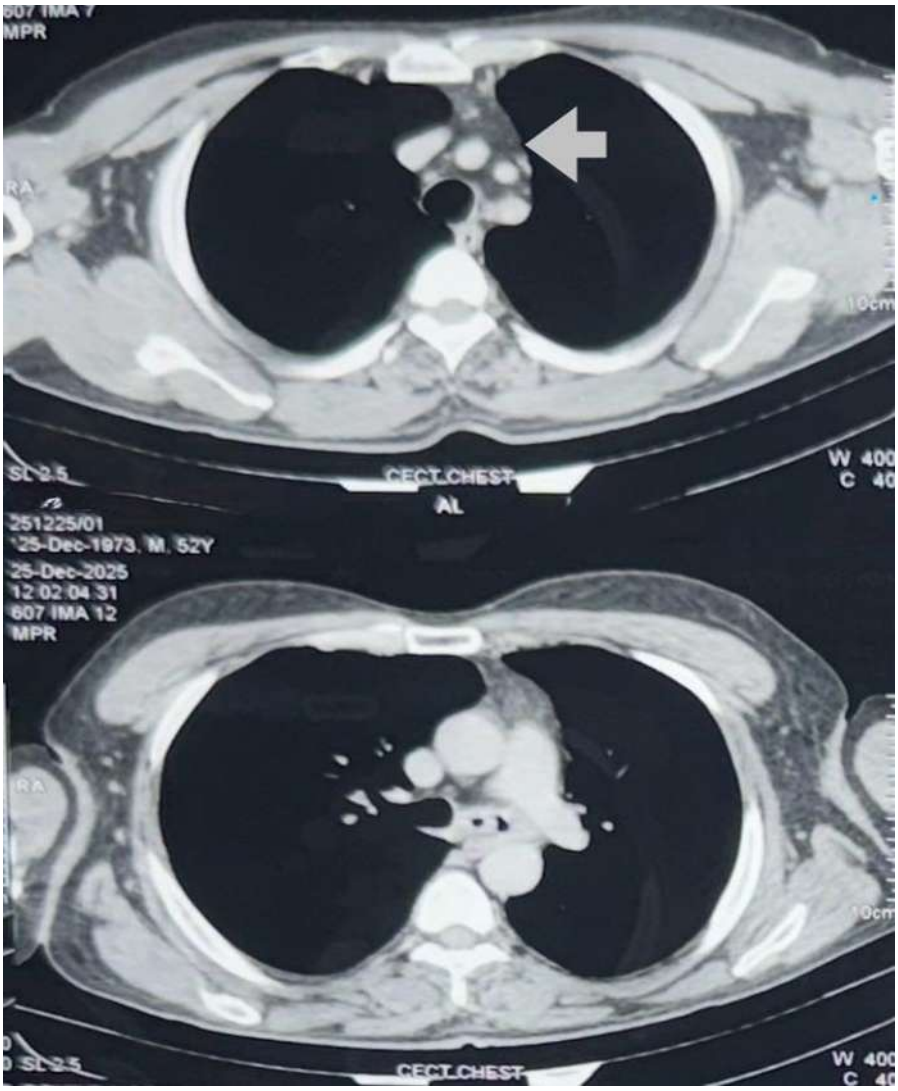
Primary tumors of the tracheobronchial tree are uncommon, accounting for less than 0.1% of all respiratory tract malignancies. Among these, adenoid cystic carcinoma is a rare salivary gland– type tumor characterized by slow growth, submucosal spread, and late metastasis. Patients often present with nonspecific respiratory symptoms such as dyspnea, wheeze, or hoarseness, leading to frequent misdiagnosis as asthma or chronic infection. In tuberculosis-endemic regions, detection of mycobacterial DNA in respiratory samples may confound diagnosis and treatment decisions. Coexistence of malignancy and tuberculosis, although uncommon, presents diagnostic and therapeutic challenges. We report a case of primary airway ACC with incidental molecular detection of tuberculosis.

Case Presentation and Clinical Management :-

A 52-year-old male plywood salesman presented with progressive breathlessness and hoarseness of voice for two months. He denied fever, hemoptysis, weight loss, or prior tuberculosis. He was a lifelong non-smoker with no significant comorbidities or occupational inhalational exposure history. On examination, vital parameters were stable and oxygen saturation was normal on room air. Chest auscultation revealed decreased breath sounds over the left lung field. Laboratory investigations were within normal limits. HRCT thorax demonstrated a well-defined soft-tissue lesion measuring 3.2 × 2.4 × 0.8 cm within the left main bronchus causing near-complete luminal obstruction without lymphadenopathy or parenchymal lesions. PET-CT showed an isolated hypermetabolic endobronchial mass with no evidence of distant metastasis. Flexible bronchoscopy revealed a smooth, vascular mass arising from the distal trachea and protruding into the left main bronchus, nearly occluding the lumen. Bronchoalveolar lavage and endobronchial biopsy were performed. Histopathological examination showed cribriform architecture with basaloid cells consistent with adenoid cystic carcinoma with Immunohistochemistry (IHC) markers positive for PanCK, CK7 and CD 117. BAL molecular testing detected Mycobacterium tuberculosis (trace; rifampicin indeterminate), whereas MGIT culture demonstrated no initial growth.

The patient was initiated on definitive radiotherapy for airway ACC along with antitubercular therapy in view of molecular positivity and regional disease prevalence. Multidisciplinary tumor board discussion recommended sequential chemotherapy following radiotherapy and close follow-up.

CT THORAX SHOWING WELL DEFINED MASS IN LEFT MAIN BRONCHUS



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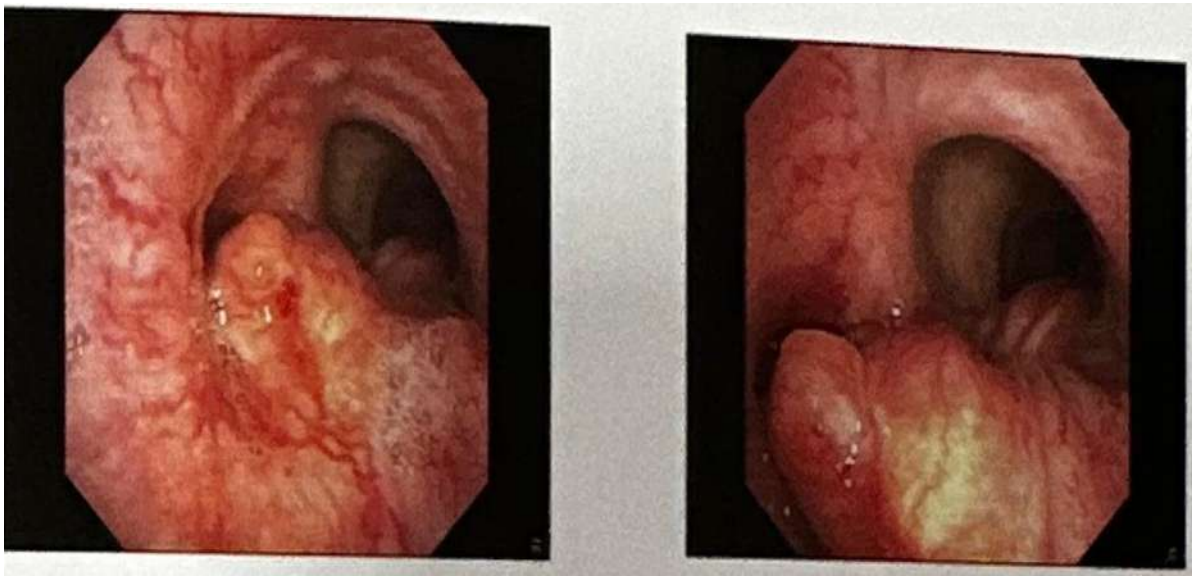
Bronchoscopy Showing Smooth, Vascular Mass Arising From The Distal Trachea And Protruding Into The Left Main Bronchus



Discussion :-

Adenoid cystic carcinoma of the airway is a rare neoplasm arising from submucosal glands and constitutes less than 1% of lung tumors. Unlike typical bronchogenic carcinomas, ACC frequently affects non-smokers and presents with symptoms of central airway obstruction rather than systemic malignancy features. Imaging plays a key role in localization and staging; however, histopathology remains the gold standard for diagnosis.

Bronchoscopic evaluation is essential for visualizing endoluminal lesions and obtaining tissue samples. The characteristic bronchoscopic appearance is a smooth, vascular, polypoidal growth with submucosal infiltration. Surgical resection is preferred when feasible, but radiotherapy is an accepted definitive modality for unresectable or anatomically complex lesions. The incidental detection of Mycobacterium tuberculosis DNA in BAL poses a diagnostic dilemma. Molecular assays are highly sensitive but may detect nonviable organisms or colonization. In high-burden countries, clinicians often initiate therapy when molecular tests are positive despite negative cultures. Coexistence of malignancy and tuberculosis has been reported and may result from local immune dysregulation, shared risk factors, or coincidental occurrence. This case underscores the need for cautious interpretation of microbiological results in malignancy and highlights the importance of integrating clinical, radiological, and histopathological data before finalizing management.

Conclusion :-

Primary tracheobronchial adenoid cystic carcinoma is an uncommon cause of airway obstruction that may mimic benign respiratory disease. Bronchoscopic biopsy is crucial for diagnosis in unexplained central airway lesions. Incidental molecular detection of tuberculosis can complicate clinical decision-making, especially in endemic settings. Recognition of possible dual pathology enables timely institution of combined therapy and coordinated multidisciplinary care.

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