

# Asthma-Like Tracheo-Bronchial Amyloidosis

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## ABSTRACT

Localized bronchial Amyloidosis is an uncommon disease of unknown origin. Clinical signs are not specific. Tracheo-bronchial symptoms are the most frequent. We report a case of a 31 year-old man complaining of asthma-like dyspnea. Bronchoscopy was performed because of ineffectiveness of antiasthmatic treatment, showed a submucosal infiltration with stenosis of both right and left upper bronchi and a complete stenosis of intermediate troncus. Multiple biopsies were performed and concluded to Amyloidosis of AL type. Oral corticosteroids were indicated with clinical improvement.

**Keywords:** Amyloidosis; Biopsy; Histology; Corticosteroids

## 1. Introduction

Tracheobronchial amyloidosis (TBA) is rare and it constitutes approximately 1% of benign tumors in these areas. It is characterized by deposition of amyloid within the airway walls, manifesting as submucosal tumors. Symptoms are related to bronchial obstruction leading to a misdiagnosis in some cases. Consequently, the diagnosis is delayed and made through bronchoscopic biopsy. No consensus exists with regard to its optimal treatment, resulting in different modalities, used to manage this condition.

We report a case of localized bronchial amyloidosis diagnosed after a history of asthma-like dyspnea.

## 2. Case Report

A 31-year-old man, non-smoking complained of asthma-like wheezing dyspnea during six months, with a recent worsening during one month. He was treated with inhaled corticosteroids and bronchodilators, but without improvement. He was admitted to our department. His clinical examination showed a respiratory rate of 28/min, a pulse rate of 90/min and blood pressure of 110/80 mmHg. Pulmonary examination revealed diffuses sibilant rales. All routine biological examinations were normal. The arterial blood gas levels in room air were as follows: PaCO<sub>2</sub> of 38.1, PaO<sub>2</sub> of 62.3, and pH of 7.47. Pulmonary function tests showed an obstructive pattern: FVC of 2.33 l (50% of predicted), FEV1 of 1.33 l (34%

of predicted) and FEV1/FVC ratio of 57%.

Chest X-ray revealed atelectasis in the middle lobe and a right hilar opacity (**Figure 1**). Bronchodilators, corticosteroids and antibiotics were administered for two weeks but without improvement. A Computed tomography (CT) scan of the chest was performed, showing airway narrowing caused by circumferential thickening of the bronchial wall and atelectasis in the left upper lobe (**Figure 2**).

Fiberoptic bronchoscopy was then performed revealing severe narrowing of the right and the left main bronchi with mucosal irregularities and a complete stenosis of intermediary bronchus and the left upper bronchus (**Figure 3**). Pathological study of bronchial biopsy demonstrated an extensive deposit in the submucosa of a hyaline substance shown to be amyloid. The epithelium over the deposit was intact. No squamous metaplasia was demonstrated. Some giant foreign-body cells were present in relation to the amyloid and small calcifications were seen. Histopathological analysis of the tissue sample, with Congo red staining, demonstrated apple-green birefringence when viewed under polarized light (**Figure 4**).

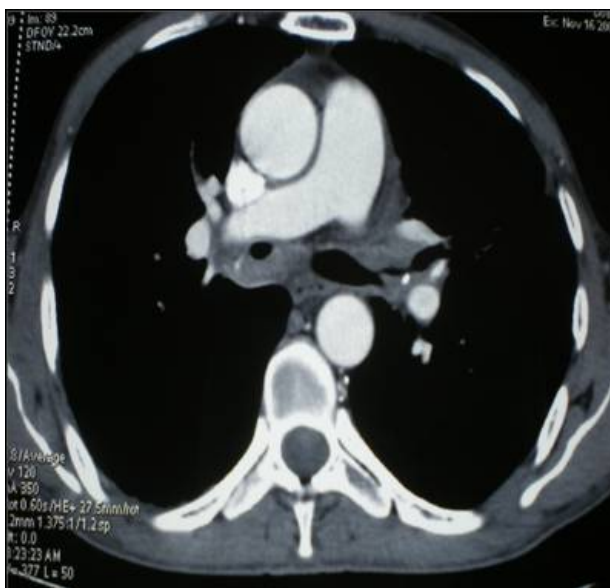
The diagnosis of bronchial amyloidosis was made and several investigations were undertaken. The results of urine analysis (for 24-h proteinuria and creatinuria) and protein profiles were within normal limits. An electrocardiogram, echocardiography and abdominal ultrasound showed no abnormalities.

The diagnosis of TBA was then made and the patient

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**Figure 1.** Chest X-ray showing deviation of the trachea and atelectasis in the middle lobe.



**Figure 2.** Chest CT scan showing airway narrowing and wall thickening with stenosis of the intermediary and left upper bronchi.

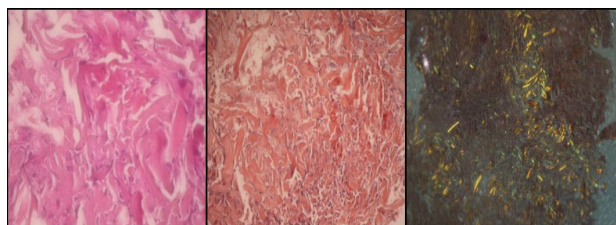
received oral corticosteroids (0.5 mg/Kg/day) with progressively decreased doses over 7 months. We noted clinical improvement of dyspnea but persistent obstructive pattern in pulmonary function tests.

### 3. Discussions

Amyloidosis is a rare condition; fewer than 150 cases were reported in the literature. It's characterized by abnormal extracellular deposition of amyloid and autologous fibrillar protein material, which binds with Congo red revealing green birefringence under polarized light [1]. All organ systems can be infiltrated by amyloid.



**Figure 3.** Bronchoscopy showing patchy areas of erythema and mucosal irregularities causing stenosis of intermediary bronchus and left upper bronchus.



**Figure 4.** Bronchial biopsy tissue showing eosinophilic masses of amyloid material; Congo, red staining demonstrating apple-green birefringence of the tissue studied under polarized microscopy.

Lesser described in 1877 three forms of respiratory amyloidosis: focal or diffuse TBA, nodular parenchymal and diffuse parenchymal amyloidosis [2]. TBA is still the most common manifestation of primary pulmonary amyloidosis which occurs exclusively in the absence of systemic infiltration [3].

It affects males more than females. The median onset age is 50 - 60 years old with ranging from age 27 to 85 years [4,5]. Common symptoms include dyspnea, non-productive cough, haemoptysis and hoarseness [6]. The disease has insidious course and its clinical presentation is not specific; thus TBA is often misdiagnosed. The patient presented in this report was treated by short acting bronchodilators and inhaled corticosteroids during 6 months because of asthma-like presentation. Consequently diagnosis was delayed.

Chest X-ray is normal in half of. Imaging especially CT-scan is helpful for diagnosis. Radiographic findings are various including bronchial wall thickening, irregular narrowing of the airway lumen, calcified nodules within the airway lumen, airway obstruction with atelectasis, postobstructive pneumonia and distal lung air trapping [5, 7]. Our patient had post obstructive pneumonia partially improved by antibiotics. In these cases other diagnoses have to be discussed such as neoplastic diseases, tuberculosis, other granulomatous disease and tracheobronchopathia osteochondroplastica. Diagnosis confirmation of TBA requires fiberoptic bronchoscopy which allows better visualization of lesions and biopsies. Positive specimen with Congo red staining with a characteristic

apple green birefringence with polarized light is the proof of amyloidosis disease [4,5].

The treatment of localized TBA is essentially symptomatic [8]. Strategies depend on the site and extent of the disease. In fact, only observation can be indicated in asymptomatic patients. However, local and or systemic therapies are recommended in patients with severe airway obstruction [9]. Drugs inhibiting the synthesis, deposition and degradation of amyloid in tissues, especially colchicine, prednisone and melphalan were used but with a limited effect [4,9]. Varied methods of bronchoscopic treatment have been reported such as endobronchial Nd-YAG laser, tracheobronchial stents, balloon dilation and bronchoscopic ablation of intraluminal amyloid deposits. These methods are associated with a risk of bleeding and recurrences [4]. Surgery may be necessary when airway involvement is extensive [5]. Recently, some investigators demonstrated that external beam radiation therapy (EBRT) may provide an objective improvement [10]. Also M. Truong found in his study that EBRT prevents progressive amyloid deposition in 90% of patients with localized airway amyloidosis and it is well tolerated with minimal toxicity [11].

Although TBA is a localized process, it is associated with poorer prognosis. Authors reported that overall survival ranges from 31% to 43% at 4 to 6 years. In absence of curative treatment of TBA, researchers are still continuously trying other therapeutic alternatives to improve the prognosis of these patients.

#### 4. Conclusion

Diagnosis of TBA has to be considered in patients with asthma-like dyspnea in whom anti-asthmatic treatments are ineffective. The diagnosis can be suggested by radiographic findings but it is confirmed essentially through bronchoscopic biopsies, with appropriate Congo red staining of the bronchial tissue samples obtained. At present, there are no therapeutic options proved to be completely successful. However, bronchoscopic management often proves to be temporarily effective, while EBRT still need to be further evaluated. Prognosis of TBA remains poor.

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