

# A malignant wheeze!

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## Abstract

Asthma is a common disorder presenting with nonspecific features, which may mimic other conditions such as tracheal tumors. Tracheal tumors are often misdiagnosed as asthma. We report a case of a 38-year female who was being worked up for persistent wheeze that was initially attributed to acute asthma, only to be later discovered as tracheal tumor. A high index of suspicion for alternative diagnoses must be kept in mind while evaluating a patient who presents with clinical features suggestive of asthma, but fails to respond to standard therapy. The present case report emphasizes the fact that not all wheezes are asthma.

## Introduction

Primary tracheal tumors are the least common tumors of the airways. They are usually encountered in the fifth to sixth decade of life being more common among male smokers and are mostly malignant. Squamous cell carcinoma and adenoid cystic carcinoma account for nearly two-thirds of all tracheal tumors [1]. These neoplasms are slow growers which produce tracheal obstruction, usually presenting with cough, dyspnea and expiratory wheeze leading to misdiagnosis as asthma [2]. Consequently, they pose a significant diagnostic challenge

and conclusive diagnosis is frequently delayed. We report the case of a 38-year female who was being worked up for persistent wheeze that was initially thought to be due to acute asthma, but interestingly discovered later to be caused by a tracheal tumor.

## Case Report

A 38-year non-smoker female presented to the emergency department with productive cough of six weeks' duration and progressive worsening of breathlessness and hoarseness of voice over seven days. She had a history of episodic cough, breathlessness and wheezing over the past few years for which she was on treatment from a primary care physician. There was no history of fever, chest pain or tightness and hemoptysis. No history of previous tuberculosis or a family history of asthma were noted. General physical examination was remarkable for profound respiratory distress and tachycardia with a respiratory rate of 46/min, pulse rate of 128/min, oxygen saturation of 82% on room air and an audible wheeze. Coarse basal crepitations were appreciable over right infrascapular area. Arterial Blood Gas analysis (done on 3L/min of O<sub>2</sub> via nasal cannula) revealed PH-7.36, PCO<sub>2</sub>- 47.7 mm Hg, PO<sub>2</sub>- 70.4 mm Hg, HCO<sub>3</sub>-27.6 mg/dl, SaO<sub>2</sub>- 96%. Complete hemogram, renal function tests and liver function tests were normal and EKG was suggestive of sinus tachycardia. Chest X-ray showed right lower zone infiltrates (Figure 1). Spirometry could not be performed due to severe dyspnea. The patient was provisionally diagnosed as having an acute exacerbation of asthma with right lower lobe pneumonia and treatment started with nebulized bronchodilators, systemic corticosteroids and empirical antibiotics. Patient did not improve even after 12 h of optimal medical therapy including a futile trial of non-invasive ventilator support, mandating a clinical review. The latter disclosed an important clinical finding of tracheal tug, necessitating the consideration of tracheal obstruction as a possible differential diagnosis. Bedside fiberoptic bronchoscopy (Figure 2) revealed left vocal cord palsy and a tracheal growth approximately 3-4 cm below vocal cords, obstructing >80% of the tracheal lumen, with secretions oozing from below. Computed Tomogram (CT) of thorax showed a large superior mediastinal mass lesion encasing the trachea and abutting the anterior wall of esophagus, with tree-in-bud nodules in right lower lobe suggestive of endobronchial spread. CT also revealed hepatic metastases (Figure 3). As the patient progressively deteriorated, she was referred to a relevant center for tracheal stenting and further management. Subsequently she was lost to follow-up.

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## Discussion

Primary tracheal tumors occur infrequently, accounting for less than 1% of all malignancies of airways. Their diagnosis can be extremely challenging. In adults, 80% neoplasms are malignant, with squamous

cell and adenoid cystic carcinoma being the most common. Malignancies of the larynx and bronchi are about 40 and 400 times more frequent than tracheal malignancies, respectively [1]. The latter are three times more common in males, and peak incidence is reported in the fifth and sixth decades of life [3]. In the present case however, the patient was a young, non-smoker female.

Patients with primary tracheal tumors may present with dyspnea that is the most frequent symptom (71%), followed by cough (40%), hemoptysis (34%), wheeze (19.5%) and stridor (17.5%) [4]. The clinical presentation may be misdiagnosed as asthma leading to a considerable

delay in accurate diagnosis and treatment. Tumor may occlude up to 75% or more of the lumen before causing symptoms.

A number of causes of airway obstruction can masquerade as asthma, few of the common causes include vocal cord dysfunction, laryngeal spasm, lymph node enlargement, tumors involving central airways, tracheomalacia, tracheal stricture, extrinsic compression. Uncommon causes can be idiopathic hypereosinophilic syndrome, Löeffler syndrome, allergic broncho-pulmonary aspergillosis, *etc.* [5,6].

All the above-mentioned conditions may present with dyspnea, wheezing and cough. The definitive diagnosis of tracheal tumors



Figure 1. Chest X-ray showing bilateral lower zone infiltrates.



Figure 2. Bronchoscopy showing nearly complete occlusion of tracheal lumen.



Figure 3. CT thorax showing a large superior mediastinal malignant mass lesion encasing thoracic trachea.

involves a combination of CT scan and bronchoscopic sampling for histopathology. Chest roentgenogram is not of much help in facilitating the diagnosis. Thoracic CT or magnetic resonance imaging may yield more valuable information on the location, size, extent and other useful parameters of the tracheal lesion. However, bronchoscopy is the cornerstone diagnostic modality as it facilitates direct visualization of the tumor as well as its sampling for histopathological examination, which has a diagnostic and prognostic significance in these centrally located lesions.

In the present report, chest x-ray of the patient showed few right lower lobe infiltrates without any other significant abnormality. Uncontrolled symptoms despite treatment led us to review the case and differential diagnosis of tracheal tumor was considered. Bronchoscopy revealed a large tracheal mass almost fully occluding the lumen. Further, CT thorax was done to determine the extent of the tracheal growth. Patient was referred for tracheal stent placement and further management.

Surgical resection is the only curative treatment for most malignant tumors of trachea, and without resection, the outcome is poor even after primary radiotherapy. The bronchoscopic therapeutic approaches such as tracheal stent placement, debridement, and Nd-YAG laser therapy are generally employed for those presenting at an unresectable stage. An aggressive approach to early diagnosis, modern tracheal surgical techniques like laryngotracheal, tracheal or carinal reconstructions, along with postoperative radiotherapy can improve the survival of patients with malignant tracheal tumors.

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## Conclusions

This case report emphasizes the fact that 'not all wheeze is asthma' and in fact a catastrophic cause like tracheal malignancy could be responsible for the patient's refractory wheeze. The alert clinician should consider the possibility of any localized airway obstruction in a patient who does not respond to appropriate anti-asthma therapy. Timely diagnosis/referral and careful surgical/palliative interventions could go a long way in salvaging such patients.

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