



## NOCTURNAL COUGH IN A MIDDLE AGED FEMALE


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### ABSTRACT

Tracheobronchomalacia (TBM) is a rare condition affecting the trachea and main stem bronchi. This condition is characterized by excessive airway narrowing (more than 50% of lumen) during forceful breathing and coughing. Patients present with chronic cough, dyspnea on exertion and sometimes symptoms of obstructive sleep apnea. It can be congenital or acquired. Acquired TBM may occur due to damage to the airway cartilage. Treatment is symptomatic. In severe cases airway stents may be useful.

**Key words:** Chronic cough, Obstructive sleep apnea, Tracheobronchomalacia, Dynamic CT scan thorax.

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### INTRODUCTION

#### MIDDLE AGED FEMALE WITH CHRONIC COUGH

A 51 year old female house wife was admitted to our hospital for evaluation of chronic respiratory symptoms. She had dry cough, more at night since last six months [1]. This was associated with throat irritation and repetitive throat clearing. She also had breathlessness on exertion which was gradually progressive from grade 1 MMRC to grade 2 MMRC over a period of 6 months. She had no fever, chest pain or hemoptysis.

Question 1: Which of the following is least likely to cause nocturnal cough, throat irritation and repetitive throat clearing?

- Upper airway cough syndrome
- Paroxysmal nocturnal dyspnea (PND)
- Drug induced cough
- Gastro esophageal reflux disease (GERD)
- Tropical pulmonary eosinophilia

Answer: B. In PND predominant symptom is nocturnal dyspnea where the patient gets up due to breathlessness and relived by upright posture

She had no symptoms suggestive of allergic rhinitis or GERD. She was not on any medications. Her husband noticed that she had loud snoring and wheezing at night since last 4 months. She also had excess daytime sleepiness, lethargy and easy fatigability. She had gained 4 kg weight since 3 months.

Question 2: Which of the following is least likely to cause lethargy, easy fatigability and excess daytime sleepiness?

- Obstructive sleep apnea
- Antihistamine intake
- Uncontrolled Bronchial Asthma
- Depression
- Hypothyroidism

Answer: C. Bronchial Asthma is least likely to cause the above symptoms. Depression and hypothyroidism can lead to the above symptoms; especially in a middle aged female these two conditions are commoner [2].

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Further enquiry revealed that she had no symptoms suggestive of hypothyroidism or depression. She had no history of haemoptysis, chest pain and change in voice or stridor. She had no joint pain, rashes or skin lesions. There was no past history of tuberculosis, diabetes mellitus or hypertension. She had consulted a physician and was prescribed inhaled bronchodilator. She did not have any relief to her symptoms with the inhaled medication.

Her general physical examination was normal. Heart rate was 78/ minute, regular, respiratory rate was 18/ minute. Height was 162 cm, weight 61 kg, BMI 22.9KG/M<sup>2</sup>. Respiratory system examination revealed bilateral decreased intensity of breath sounds in all areas. No added sounds were heard. Cardiovascular / per abdomen/ central nervous system examination was normal.

Question 3: Which of the following is not a risk factor for developing obstructive sleep apnea (OSA)?

- A. Hypothyroidism
- B. BMI < 18KG/M<sup>2</sup>
- C. Short neck
- D. Acromegaly
- E. Enlarged adenoids

Answer: B.

Anatomical abnormalities and obstructive lesions in upper airway, endocrine abnormalities can lead to OSA apart from short neck and obesity.

Question 4: What is the next investigation?

- A. Chest X-ray
- B. Spirometry
- C. ABG
- D. Thyroid function test
- E. ECG

Answer: A. First investigation in any patient with chronic respiratory symptom is chest x ray.

Figure 1: Chest x ray

#### **Chest x ray was normal.**

Sputum AFB smear was negative. ECG, Echo cardiography, Thyroid function tests, ABG were all normal [3].

Question 5: What could be the cause for nocturnal wheezing and OSA symptoms in this patient?

- A. GERD
- B. Hypocalcaemia
- C. Systemic sclerosis
- D. Tracheobronchomalacia
- E. COPD

Answer: D. Nocturnal wheezing and OSA without obvious cause is highly suggestive of Tracheobronchomalacia. Collapse of the major airways during expiration in Tracheobronchomalacia leads to wheezing and OSA symptoms

Question 6: What is the next diagnostic investigation?

- A. Dynamic CT scan of thorax

- B. Polysomnography
- C. Bronchoscopy
- D. Contrast CT scan of Thorax
- E. Spirometry

Answer: A

Figure 2 to 5 CT scan thorax

CT scan showed collapse of trachea with bowing of the posterior membranous portion anteriorly. Crescent shaped trachea is seen in axial plane. Collapse of Bronchus is also seen confirming the diagnosis of tracheo bronchomalacia. Luminal narrowing of trachea and bronchi more than 50% during expiration is characteristic CT feature of tracheo bronchomalacia [4].

Question 7: What is the confirmatory investigation for Tracheobronchomalacia?

- A. Bronchoscopy
- B. Dynamic CT
- C. Spirometry
- D. Bronchography
- E. CT virtual Bronchoscopy

Answer: A

Flexile Bronchoscopy while having the individual breathing deeply, coughing and exhaling will demonstrate the dynamic collapse of the airways leading to more than 50% of luminal narrowing is typical of TBM.

Question 8: Which of the following is not a symptom in Tracheobronchomalacia?

- A. Chronic cough
- B. Recurrent LRTI
- C. Symptoms of OSA
- D. Hemoptysis
- E. Breathlessness on exertion

Answer: D.

Hemoptysis is not a feature of Tracheobronchomalacia. Recurrent infection and chronic cough occur due to retention of secretions.

Question 9: Which of the following is not a cause for Tracheobronchomalacia?

- A. Cartilage abnormalities
- B. Recurrent infections
- C. Severe COPD
- D. Prolonged external compression of airways
- E. Prolonged intubation

Answer: E.

Tracheobronchomalacia is a rare disease in which the cartilage of the trachea and main stem bronchi lose their stiffness leading to collapse of the airways especially during forceful expiration. It can be congenital or acquired. Acquired TBM may occur due to damage to the airway cartilage due to indwelling tracheotomy and endotracheal intubation

with inflatable cuffs, long term mechanical ventilation, chest trauma (tracheal fractures) and compression of the trachea or bronchia by masses such as tumors, thyroid masses, dilated aortic or pulmonary arteries. Chronic infections such as tuberculosis, inflammatory diseases such as polychondritis and congenital diseases such as Ehlers-Danlos syndrome also may cause TBM. Chronic irritation and coughing in asthma and COPD may weaken the tracheal bronchial wall and damage elastic fibers of the membranous portion of the wall leading to TBM. In some cases the cause may not be obvious as in this patient [5].

Patients with Tracheobronchomalacia present with unexplained chronic cough, shortness of breath on exertion, recurrent lower respiratory tract infections, and nocturnal wheeze. These symptoms mimic obstructive airway disease but they lack

response to bronchodilator therapy and steroids. Dynamic CT scan of the lungs revealing a greater than 50% reduction in airway caliber between inspiration and expiration is diagnostic. Flexible Bronchoscopy while having the individual breathing deeply, coughing and exhaling will demonstrate the dynamic collapse of the airways typical of TBM.

In most cases no treatment is required. Symptomatic management includes improving oxygenation. In severe cases, treatment options include nocturnal CPAP and Y-stent insertion.

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**CONFLICT OF INTEREST:**

The authors declare that they have no conflict of interest.

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