

All that wheezes is not asthma

Wheeze ≠ Asthma?

asthma is one of the commonest chronic illnesses in Singapore with a prevalence of 5% of adults and 20% of children. It is probably the commonest cause of wheeze all over the world. Wheezing occurs when airways are narrowed, causing resistance to airflow. Wheezing occurs mainly in expiration because the positive intrathoracic pressure generated during expiration results in a narrower airway, hence, resistance occurs easily.

Asthma is defined as a variable airway obstruction in response to various stimuli like upper respiratory tract infections, cold, allergens, emotion, etc. Variable airway obstruction can be defined in the clinic setting by a peak expiratory flow rate (PEFR) or forced expiratory volume in the first second (FEV1) by more than 12%. An objective way of confirming asthma is to use bronchoprovocation testing, using either histamine or methacholine in the laboratory.

When wheezing is something else

However, it is important to recognise that not all wheezing is due to asthma. Most of us know that the differential diagnosis of wheezing includes congestive heart failure (CHF) and chronic obstructive pulmonary disease (COPD). In these two situations, a careful clinical examination in between exacerbations usually continues to be abnormal. Chest X-rays in these two conditions are also usually abnormal.

Acute bronchitis is an acute condition usually resulting from infectious causes like viruses and atypical agents like *Mycoplasma* and *Chlamydia*. The typical history is similar to that of an upper respiratory tract infection except that clinical examination shows wheezing. Treatment with antibiotics including either macrolides (azithromycin or clarithromycin) or quinolones (ciprofloxacin, levofloxacin or moxifloxacin) results in good resolution of symptoms. Occasionally, an acute bronchitis presentation can be due to a chemical inhalation injury (like chlorine), resulting in a Reactive Airway Dysfunction Syndrome (RADS).

In burns patients, wheezing is a sign of lower respiratory involvement. Bronchoscopy usually shows oedema, sloughing or ulceration of the bronchial mucosa, suggesting a need for mechanical ventilation. Acute pulmonary embolism is another cause of wheezing resulting in patients admitted to the ICU with acute respiratory failure. The history is important, as most patients would have risk factors, e.g., malignancy, prolonged travel, recent immobilisation or major surgery.

Another common cause of wheezing is postnasal drip. This is usually in the setting of patients with chronic sinusitis. Aggressive treatment of the upper airway with antihistamines and antibiotics usually result in resolution of the wheeze. In patients with chronic allergic rhinitis, it is important to look for concomitant asthma. Up to 40% of patients with chronic allergic rhinitis do have asthma and control of allergic rhinitis is important in the control of the asthma.



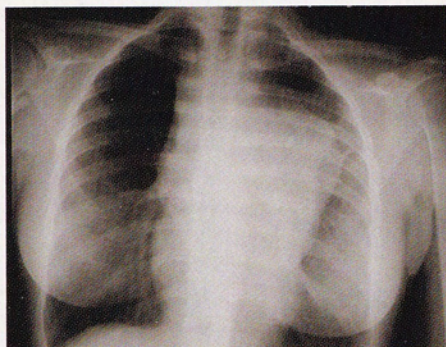


FIGURE 1 CXR with an abnormal left heart silhouette suggesting an Anterior Mediastinal Mass

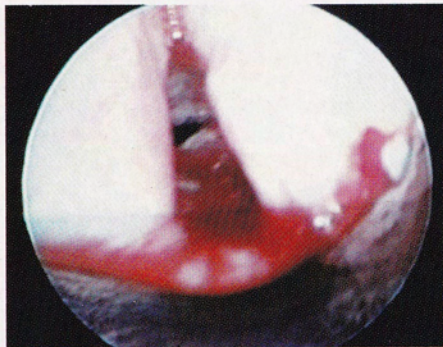


FIGURE 2 Bronchoscopic appearance of severe subglottic stenosis

Foreign bodies in the airways are an important cause of wheeze that should not be missed. Textbooks describe the typical patient with airway foreign body as the elderly and children less than five years old. It should be remembered that any patient who cannot protect his airway could also have a foreign body. Another clinical pearl is that most foreign bodies are not radio-opaque. Chest x-rays may show subtle clues like a ball valve effect with expiratory films showing contralateral shift in mediastinum.

CASE 1

One of the most interesting cases I have encountered was a 16-year old boy who had poorly controlled epilepsy and started developing asthma symptoms for six months. CXR showed a possible linear density in the lower trachea. Bronchoscopy showed the broken end of a porcelain spoon and I had to perform a rigid bronchoscope to remove the foreign body. In retrospect, the mother remembered that a few months ago, he suffered a seizure episode in a hawker centre when they were having noodles. The mother instinctively used the handle of the spoon to try to prevent him from biting his tongue during the seizure episode.

Unusual causes of wheezing

Another cause of wheezing that should not be missed is lung cancer. This can be primary lung cancer or metastases. Common causes of metastases to the airways arise from colorectal cancer, cancer of the kidneys and malignant melanoma. Malignant lymphoma can also involve the major airways. Primary lung cancer involving only the major airways is uncommon. Carcinoid tumours and mucoepidermoid cancers are low-grade

tumours of the lung that typically involve the major airways mainly. They usually occur in younger patients who are non-smokers. The key to diagnosis is an accurate history and a detailed clinical examination, followed by a Chest x-ray. Most of these patients would have haemoptysis, which is not a symptom of asthma. Persistent haemoptysis mandates bronchoscopic examination, no matter what the chest x-ray shows.

Another unusual cause of wheeze is due to an anterior mediastinal mass. Anterior mediastinal masses are usually due to thyroid enlargement, thymomas, teratomas and lymphomas. Huge anterior mediastinal masses can result in compression of the major airway resulting in wheeze and respiratory failure, sometimes catastrophic.

CASE 2

A few years ago, I was called to see an 18-year old female patient who presented with status asthmaticus requiring mechanical ventilation. However, mechanical ventilation resulted in very high airway pressures and a review of her chest X-ray revealed an abnormal left cardiac silhouette (Figure 1). As she clearly worsened due to the mechanical ventilation, an emergency CT Thorax was done, which revealed a huge bronchogenic cyst compressing her lower trachea. She was sent for thoracotomy in near cardiopulmonary arrest, and surgery proved to be life-saving.

One of the relatively uncommon causes of wheezing in Singapore is endobronchial tuberculosis. Pulmonary tuberculosis usually affects the lungs but occasionally this extends to the larynx or major tracheobronchial tree. Bronchoscopy may

demonstrate changes ranging from cheesy exudation to tracheomalacia to stricture formation. These patients sometimes require surgical resection or laser or airway stenting.

CASE 3

A few years ago, a patient who was thought to have severe chronic asthma refractory to treatment was referred to me. She was admitted in cardiopulmonary arrest and when they tried to intubate her, they realised that she had severe subglottic stenosis from previous tuberculosis (Figure 2). They then went on to do a bedside tracheostomy to bypass the upper airway obstruction as she was in respiratory arrest. I subsequently performed a rigid bronchoscopy under general anesthesia to dilate the subglottic stenosis and stent the narrowed area.

One rare complication of tuberculosis is broncholithiasis. In this condition, the calcified lymph node erodes into the airway, causing asthma-like symptoms of wheezing and chronic cough. Bronchoscopy is diagnostic and therapeutic bronchoscopy to remove the broncholith can be performed.

In patients with asthma-like symptoms and lung infiltrates on chest X-ray, one must bear in mind other rare causes of a wheezing illness. This is especially if treatment of asthma results in less than optimal improvement or that the chest X-ray is abnormal. Examples include sarcoidosis, amyloidosis or Wegener's granulomatosis.

In summary, asthma is the commonest cause of wheezing but it is important to recognize that there are many other causes of wheezing other than CHF and COPD. The key is an accurate history and clinical examination followed by a chest X-ray. 



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