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Impact Factor: 4.428

## Unveiling the Silent Invader: A Rare Presentation of Common Disease, Case of Laryngeal Tuberculosis in a Young Woman - Clinical Presentation, Diagnostic Challenges, and Successful Management

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### Abstract

*Laryngeal tuberculosis is a rare manifestation of extra-pulmonary tuberculosis that poses diagnostic challenges due to its nonspecific symptoms. We present a case report of a 23-year-old female with laryngeal tuberculosis, emphasizing the importance of early recognition and prompt treatment to prevent complications.*

*The patient presented with a three-month history of hoarseness which was associated with significant weight loss. Initial investigations revealed an elevated Erythrocyte sedimentation rate (ESR), an abnormal chest x-ray showing right upper zone fibrosis and laryngeal narrowing. Fibre optic bronchoscopy revealed an edematous, ulcerated, and inflamed larynx with normal vocal cords, inflamed trachea, and Carina. Bilateral main and right upper lobe bronchi showed hyperemia and ulceration. Bronchoalveolar lavage from the right upper and lower lobes demonstrated acid-fast bacilli on microscopy and Gene-Xpert positive for Tuberculosis.*

*This case report highlights the significance of considering laryngeal tuberculosis as a differential diagnosis in patients presenting with persistent hoarseness, vocal cord lesions, and laryngeal oedema, especially in those with risk factors for tuberculosis. Early recognition and treatment of laryngeal tuberculosis are paramount to achieving favourable outcomes and minimizing long-term sequelae.*

**Keywords:** Common Disease, Case of Laryngeal Tuberculosis, Clinical Presentation, Diagnostic Challenges, Successful Management

### Introduction

Tuberculosis (TB) is a communicable disease caused by the bacillus *Mycobacterium tuberculosis* [1]. The disease is one of the leading causes of mortality and morbidity worldwide [2]. The reported number of newly diagnosed cases of TB globally was 6.4 million in the year 2021[3]. However, the incidence of tuberculosis in Sri Lanka gradually decreased from 66 cases per 100,000 people in 2002 to 63 cases per 100,000 people in 2021[4].

Laryngeal tuberculosis (TB) is a rare form of TB which has an incidence of less than 1% of all tuberculosis cases [5]. Direct infiltration by inhaled tubercle bacilli is the generally accepted route of infection [6]. Usually, this granulomatous disease results secondary to pulmonary tuberculosis [6]. But, the laryngeal localization may result in a primary lesion without pulmonary involvement [6, 7]. Hoarseness, dysphagia, fever and localized pain are the typical symptoms of the disease [5, 8, 9]. The diagnosis of the disease requires a high level of clinical suspicion. The present case demonstrates the unacceptable delay in diagnosing laryngeal TB in a medical student.

## Case Report

A young 23-year-old Medical Student who was previously well developed on and off wheezing two years ago. She was managed as bronchial asthma with inhalers to which she was having symptomatic improvement. While on this treatment she developed a dry cough eight months ago. The cough was persistent and non-productive. During this time she was managed as a bronchial asthma exacerbation by the local hospital's respiratory medicine team. She developed hoarseness of voice three months ago which gradually worsened. These symptoms were associated with a significant loss of weight with a measured weight loss of eight kilograms over two months. She did not complain of having loss of appetite, fever, night sweats or hemoptysis. She has a history of tuberculosis contact. She had no history of rhinorrhea or nasal obstruction suggestive of post-nasal drip. She has no regurgitation or dyspeptic symptoms to suggest gastroesophageal reflux disease. She denied a history of neck swelling in the anterior neck suggestive of thyroid growths. With the onset of the hoarseness of voice, the team who was managing her at that time referred her to an Otolaryngologist who had attempted to perform a laryngoscopy but failed due to excessive coughing.

She has no other medical or surgical problems other than her previous doubtful diagnosis of asthma. She is a third-year medical student who lives in a student accommodation sharing her room with another student. She has significant exposure to biomass fuel fumes, cats and woollen clothing. On general examination, she was not febrile, not pale and had no clubbing. There were no enlarged lymph nodes as well. She was alert, conscious and rational with no focal neurological signs. Her blood pressure was 110/70 mmHg with a pulse rate of 112/min. Her heart was clinically normal on auscultation. Her lung examination was also clinically normal with a saturation of 99% on air. Abdominal examination was soft and non-tender with no obvious organomegaly. Basic investigations including full blood count, C-reactive protein, serum electrolytes, serum creatinine and liver function tests revealed within normal range.

Her ESR was elevated to 55 mm in the first hour. Chest x-ray was abnormal and noted to have right-sided upper zone fibrosis with narrowing of the larynx.

Fibre optic bronchoscopy was performed. The larynx was noted to be edematous, ulcerated and inflamed with a cobblestone appearance while the vocal cords were normal. The trachea had multiple ulcerations and was inflamed. The Carina was also inflamed. Bilateral main and right upper lobe bronchi were also abnormal in the appearance of hyperemia and ulceration. Broncho alveolar lavage was done from the Right upper lobe and Right lower lobe bronchus. These samples tested positive for acid-fast bacilli on microscopy and Gene- X pert positive for Tuberculosis. Treatment was started with anti-tuberculosis drugs with high-dose steroids to be tailed off. She was given an inhaler with an inhaled corticosteroid and long-acting beta-agonist with oral bronchodilators and antihistamine for symptomatic relief.

## Discussion

Laryngeal tuberculosis can manifest as a secondary infection stemming from the dissemination of advanced pulmonary disease through bronchogenic, hematogenous, or lymphatic routes [10]. Among these pathways, hematogenous spread is widely acknowledged as the predominant mode of infection [10, 11]. On the other hand, primary laryngeal tuberculosis, which occurs without pre-existing pulmonary involvement, is relatively rare and is thought to arise from direct inhalation-mediated invasion of the larynx [12]. The primary sites of laryngeal involvement commonly observed include the epiglottis, true vocal cords, and false vocal cords, although the infection may extend beyond these regions and affect various other tissues[10].

The primary clinical manifestation of laryngeal tuberculosis is hoarseness, which may be accompanied by dysphagia, odynophagia, cough, stridor, or nonspecific symptoms like weight loss, fever, and fatigue [5, 8, 9]. To prevent any delay in diagnosis and appropriate treatment, it is essential to consider the possibility of tuberculosis in patients presenting with chronic hoarseness, odynophagia, and/or weight loss [9, 13].

In regions where laryngeal tuberculosis is uncommon, distinguishing it from primary malignancy becomes challenging due to its mass-like and infiltrative appearance, as well as its relatively nonspecific clinical presentation [10,14]. However, it is important to consider that laryngeal cancer is typically observed in older individuals and is rarely diagnosed before the age of 40 [15]. In addition to squamous cell carcinoma, other potential diagnoses include chondrosarcoma, atypical carcinoid tumour, extranodal natural killer/T cell

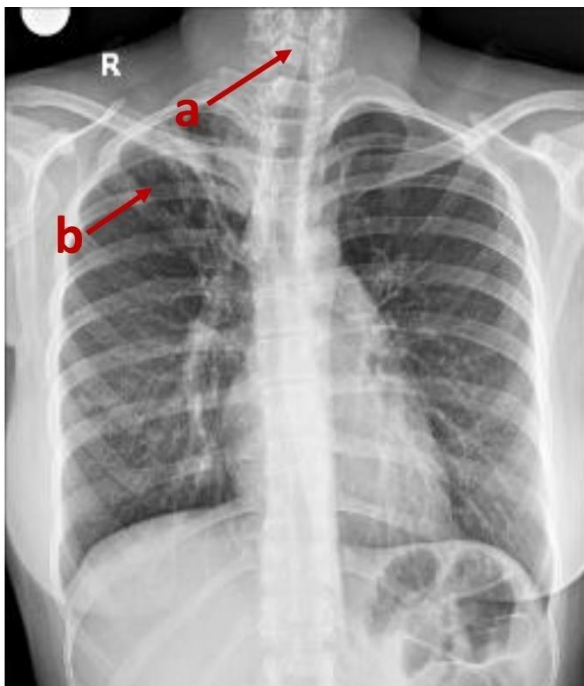
lymphoma, diffuse large B-cell lymphoma, paraganglioma, and metastatic adenocarcinoma [16]. However, there are only a limited number of documented cases in the literature involving non-squamous carcinomas of the larynx. Primary laryngeal non-Hodgkin lymphoma is a rare condition, accounting for less than 1% of laryngeal tumours [17].

In addition to neoplastic processes, there are alternative granulomatous disorders that can present with laryngeal involvement and should be included in the differential diagnosis [7]. These encompass granulomatosis with polyangiitis, sarcoidosis, and syphilis, as well as fungal infections such as histoplasmosis, blastomycosis, and coccidioidomycosis [7]. Since, there is a typical correlation between laryngeal tuberculosis (TB) and pulmonary TB, a chest radiograph can reveal abnormalities, and a TB skin test (known as "Mantoux") may yield positive results [18]. Additionally, sputum microscopy demonstrates positivity in approximately 20% of patients. PET-CT imaging has the capacity to assess the scope of extrapulmonary TB by detecting intense F-fluorodeoxyglucose uptake in tuberculous lesions, thereby proving valuable in diagnosing laryngeal TB [19].

Although it is rare, laryngeal tuberculosis must be considered in the differential diagnosis of laryngeal lesions. In our case, the diagnosis of laryngeal tuberculosis was confirmed with biopsy which was suggestive of granulomatous disease. The primary treatment is with a regimen of multiple anti-tuberculous medications, including isoniazid, rifampin, ethambutol, and pyrazinamide which result in a quick clinical response. Surgery is reserved for those cases with airway compromise. Adjunctive steroid treatment should be administered according to the site of involvement as well as complications related to TB.

## Conclusion

Laryngeal tuberculosis is an uncommon presentation that may imitate primary malignancy. Early diagnosis is essential to minimize morbidity as well as mortality. A high level of clinical suspicion is mandatory to ensure a secure laryngeal biopsy.



**Figure A**

Laryngeal narrowing

Right upper zonal fibrosis with cavitation



**Figure B**



**Figure C**

**Figure B, C:** Multiple laryngopharynx nodules with mucosal edema associated with hyperemia



**Figure D:** Laryngeal edema with luggish movement

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