



PULMONARY AND LARYNGEAL TUBERCULOSIS: A CASE REPORT WITH DIAGNOSTIC CHALLENGES

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ABSTRACT

Background: Laryngeal tuberculosis is a rare kind of tuberculosis that typically arises from direct transmission from a bronchus or through hematogenous dissemination. Hoarseness, the dominant symptom of laryngeal tuberculosis, may also accompany dysphagia, odynophagia, cough, or other nonspecific manifestations such as fever or localized pain. Histopathologic investigation is required to confirm laryngeal tuberculosis, which can resemble laryngeal cancer. **Case report:** We are reporting a case of 32year old female whom we diagnosed laryngeal tuberculosis on the basis of radiological and histological features. **Discussion:** Laryngeal tuberculosis is an uncommon ailment that might resemble laryngeal carcinoma. Patients with a smoking history presenting with dysphonia, odynophagia, cough, and laryngeal tumor (LT) should be examined as a potential diagnosis.

KEYWORDS : Laryngeal tuberculosis, dysphagia, cough

INTRODUCTION

Tuberculosis (TB) is a persistent bacterial infection caused by a species of the *Mycobacterium tuberculosis* complex. Laryngeal tuberculosis (LT) is an uncommon condition, with a frequency of under 1%. [1] The disease typically arises from pulmonary TB via direct transmission from infected sputum; however, it may also manifest as a primary lesion localized in the larynx without any pulmonary involvement. [2-4]. Patients usually present with symptoms like hoarseness of voice, cough, dyspnea, dysphagia, hemoptysis and in later stages stridor. Patients also present with odynophagia and otalgia. [5] A direct laryngoscopy accompanied by a biopsy is essential for establishing a definitive diagnosis. Specially since the lesion may resemble laryngeal carcinoma the other methods like vediolaryngostroboscopy, bronchoscopy are the initial methods in diagnosis [6, 7, 8]. This article details a case of laryngeal tuberculosis in a patient with primary pulmonary tuberculosis.

Case report

A 35year old female patient presented to ENT department with complains of hoarseness, dyspnea and dysphagia. She additionally claimed dysphonia and odynophagia for the past two months. Her symptoms had deteriorated, necessitating additional examination. On examination, the patient was vitally stable. She showed no signs of severe respiratory distress or systemic disease, such as fever or significant weight loss.

Indirect laryngoscopy showed a mass on vocal cord and was biopsied. however, the tissue sample was inadequate for histopathology. Bronchoscopy was performed to obtain a sufficient sample for further evaluation. The biopsy sample was tested with GeneXpert, which detected *Mycobacterium tuberculosis* (MTB). Further, a CT-guided lung nodule biopsy was taken and tested by a gene expert that detected *Mycobacterium tuberculosis* and showed sensitivity to rifampicin.

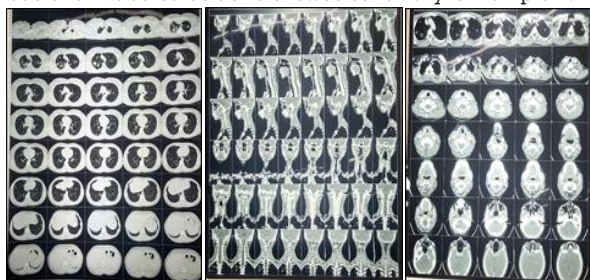


Figure 1: HRCT

thorax(P+C): Multiple variables sized non enhancing nodular air space opacities and few cavitatory areas within are noted involving right upper and lower segment and left upper lobe segment

Figure 2,3: CECT NECK: There is heterogeneously enhancing irregular mucosal thickening involving the supraglottic region extending up to the glottic region.

The epiglottis, bilateral ary-epiglottic folds, and vocal cords (right > left) appear thickened with mucosal irregularities and heterogeneous enhancement on post-contrast study. Maximum thickness of 10 mm at the right supraglottic region.



Figure 4: Bronchoscopic guided vocal cord image: There appears to be an irregular, possibly ulcerated or exophytic lesion involving the vocal cords, on the right side. The mucosa looks thickened and irregular, with areas of apparent necrosis or ulceration. The surrounding tissues show signs of erythema (redness) and swelling, indicating possible infection, inflammation, or malignancy.

Laboratory Examinations

Routine blood tests showed a haemoglobin concentration of 10.5 g/dL. The white blood cell (WBC) count was marginally low at $3.51 \times 10^9/L$, potentially signifying chronic inflammation or an infectious disease. The platelet count was within the usual range, at $268 \times 10^9/L$. Other blood investigations were normal.

Imaging

A high-resolution computed tomography (HRCT) scan of the thorax was conducted to evaluate the degree of the patient's pulmonary involvement. The scan showed several nodular air-space opacities and cavitary lesions of different sizes in the upper and lower lobes of the right side of the brain, as well as in the upper lobe of the left side. The greatest lesion, measuring 2.3×2.0 cm, was situated in the right apical portion of the right upper lobe.

Vocal cord Biopsy (02/09/2024)

An indirect laryngoscopy guided vocal cord biopsy was done by ENT specialists. CBNAAT report revealed presence of Mycobacterium tuberculosis with rifampicin resistance indeterminate. Acid-fast bacilli (AFB) were absent in the staining, and the histopathological examination (HPE) was inconclusive due to a deficient sample.

Bronchoscopy (10/09/2024)

Bronchoscopy was performed to visualize airway. The mucosa of vocal cord appeared thickened and irregular, an exophytic mass with apparent ulceration was visualized over posterior aspect of right vocal cord. The surrounding mucosa was hyperemic. On further advancement of scope, the tracheo-bronchial tree along with carina appeared normal. Biopsy of the mass over vocal cord was taken with standard precautions. Histopathological report suggestive of caseous necrotic granulomas with palisading giant cells and langhans cells. BAL washings were taken. Tissue and BAL CBNAAT suggested presence of MTB with rifampicin sensitive.

CT-Guided Lung Nodule Biopsy (12/09/2024)

A CT-guided biopsy of a lung nodule was conducted. Gene Xpert confirmed the presence of MTB, and sensitive to rifampicin. The TB-MGIT test indicated the presence of acid-fast bacilli (AFB). Histopathological examination (HPE) revealed persistent necrotising granulomatous inflammation, suggestive of Koch's disease (tuberculosis).

Hence patient was started on standard drug sensitive TB regimen- HRZE. Patient was monitored for clinical improvement and drug side effect profile on follow up. There was a weight gain, symptomatic relief and improved chest radiographic appearance.

DISCUSSION

Laryngeal tuberculosis is the most prevalent granulomatous laryngeal condition. [9] The absence of pathognomonic signs or minimal concerning symptoms, such as hoarseness, often leads to erroneous diagnoses. [10] Focus attention on men aged 40-60 who exhibit risk factors such as HIV, diabetes, immunosuppressive medication use, and a history of smoking. [11,12] Endoscopic examinations reveal more severe changes in smokers compared to non-smokers, suggesting that smoke induces a persistent impact on the laryngeal mucous membrane. [13] LT mostly impacts the epiglottis, vocal folds, and vestibular folds. Nonetheless, it can spread to any region of the larynx. [14] Symptoms correlate with the impacted areas, presenting as dysphonia, odynophagia, weight loss, exertional dyspnoea, and cough. [15] A thorough otorhinolaryngological examination, imaging studies, laboratory tests, and histological evaluation establish the diagnosis of LT. [16] The definitive method for confirming tuberculosis is the culture of Mycobacterium tuberculosis; nevertheless, the prolonged growth cycle may postpone therapy. Another rapid and straightforward procedure is acid-fast staining; nevertheless, it exhibits a low positivity rate. Furthermore, in laryngeal tuberculosis cases, smears and cultures may prove ineffective due to the diminished concentrations of bacilli in the larynx. [17] The larynx serves as a secondary site for tuberculosis infection. Consequently, the initial recommended step in diagnosing tuberculosis is a chest X-ray and/or chest CT to evaluate pulmonary involvement. [14] Another problem with finding laryngeal tuberculosis (LT) is that the sores can look different when the throat is looked at through a laryngoscope. LT sores can look like those from other conditions, like laryngeal gastroesophageal reflux syndrome, leukoplakia, contact ulcers, polyps, or even cancer. [17] CT scans and/or MR imaging are advised for a better understanding of the disease's spread. On CT scans, indicators of laryngeal tuberculosis include localized thickening or masses in the epiglottis, vocal folds, and paralaryngeal tissues. [6] Histopathological investigation may reveal granulomas containing large cells, with or without necrosis, as well as the presence of Mycobacterium tuberculosis and positive acid-fast stain results. [18] A 6-month regimen involving

isoniazid (INH), rifampin (RIF), pyrazinamide (PZA), and ethambutol (EMB) is a recognised treatment for drug-susceptible tuberculosis. This regimen involves administering all four medications for 2 months, with a continuation of INH and RIF for an additional 4 months. In instances of delayed treatment commencement, the duration may extend up to 9 months. For rifampicin-resistant or multidrug-resistant tuberculosis, the utilisation of second-line medication combinations is advised, with the treatment duration extended to a minimum of 18 months. [17]

CONCLUSION

From our case report we reiterate the importance of finding primary source of TB especially in a disseminated case. Tools like CT guided biopsy, bronchoscopy help eliminate alternative diagnoses like malignancy.

This further more reinforces the importance of histopathological correlation. Molecular studies are important to document drug resistance and ensure targeted therapy. From our case report we show the importance of exploring diagnostic tools to achieve appropriate diagnosis and initiating early treatment.

This case illustrates a patient with lung nodules and cavitary lesions indicative of tuberculosis, confirmed by the detection of MTB via GeneXpert testing. The ambiguous rifampicin resistance finding complicates the treatment plan, necessitating additional testing to elucidate medication susceptibility.

This underlines the the role of broncoscopy, biopsy and molecular testing in the diagnosis of tuberculosis which would ensure the early adequate and effective treatment.

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