

CASE PRESENTATION

Tuberculosis of epiglottis

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ABSTRACT

Tuberculosis (TB) of the epiglottis is a scarce form of extrapulmonary tuberculosis. Typically, it presents with non-specific symptoms, often involving changes in voice quality, such as a muffled voice. This is usually the first indication of laryngeal involvement, prompting the patient to seek medical attention. In this case, we report a 41-year-old male from Baghdad who presented with a four-week history of voice changes, night sweats, fever, and cough, accompanied by epiglottic swelling, which was identified through fibro-optic laryngoscopic examination.

Routine laboratory tests and ultrasound and CT scan imaging were conducted. Direct laryngoscopy was performed to examine the lesion, and a biopsy was taken for histopathological evaluation. Additionally, a Genexpert test was done, which confirmed the diagnosis of epiglottic tuberculosis. The patient was started on a standard regimen of antitubercular therapy (ATT) for six months. By the end of the treatment course, the patient had clinically improved, with fever and night sweats resolved, and there was a significant improvement in the quality of his voice.

Key words: Tuberculosis, Epiglottis, Genexpert.

INTRODUCTION

Tuberculosis (TB) is a chronic bacterial infection caused by *Mycobacterium tuberculosis*, which forms characteristic granulomas in affected tissues through cell-mediated immunity. TB remains one of the leading health concerns in developing countries. While the lungs are the most commonly affected organ, TB can also involve other organs.^[1]

Persons with immunodeficiency conditions, diabetes mellitus, malignancy, and using immunosuppressive drugs have a significant risk factor for upper respiratory tract tuberculosis.^[2] Laryngeal TB is a rare form of extrapulmonary TB.^[3] Its incidence is estimated to be less than 1% of all TB cases,^[4] and it is

highly contagious.^[5] TB of the larynx involves mainly the vocal cords and the ventricular band and is associated with pulmonary tuberculosis in 80% of cases; however, isolated epiglottic tuberculosis can occur in some instances.^[6,7]

Primary laryngeal tuberculosis mostly occurs in adult males aged between 40 and 50 years.^[8] The disease affects the posterior part of the larynx more than the anterior.

In decreasing incidence, parts of the larynx affected by tuberculosis are inter-arytenoid folds, ventricular bands, vocal cords, and epiglottis.^[9] Laryngeal TB can develop due to contaminated sputum, particularly in the inter-arytenoid region (direct spread); this leads to the formation of sub-mucosal tubercles, which may later show caseation and ulceration. This

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process may also occur through hematogenous and lymphatic routes with or without lung lesions.^[10]

Laryngeal tuberculosis (TB) typically presents with symptoms that are often non-specific, making early diagnosis challenging. The presentation may vary depending on the extent of disease involvement, the individual's immune status, and the presence of pulmonary TB. The most common presentation includes a range of local and systemic symptoms. Hoarseness of voice and persistent cough are the most common symptoms of laryngeal TB and are early presenting symptoms. Dysphagia, odynophagia, cough, stridor, and hemoptysis are other symptoms. These localized symptoms may be associated with systemic complaints like low-grade fever, night sweats, body weight loss, malaise, and cervical lymphadenopathy. The symptoms of laryngeal TB may develop gradually and become more pronounced over time, especially if left untreated. These symptoms may simulate many other infections and malignancies.^[11,12]

When laryngeal tuberculosis (TB) is suspected, the diagnostic procedure involves direct laryngoscopic examination and biopsies for histopathological evaluation to confirm the diagnosis. Histological examination of the biopsy reveals granulomas with caseating necrotic centres, Langhans' giant cells, and acid-fast bacilli.^[13]

However, laryngeal tuberculosis is often misdiagnosed, which leads to delays in determining the appropriate treatment. This delay can result in the spread of infection, posing a significant public health risk.^[14] The delay in diagnosis is often due to seemingly minor symptoms, such as hoarseness, with more severe symptoms only emerging in later stages. These include laryngeal stenosis with dyspnea and stridor, dysphagia, otalgia, odynophagia, and hemoptysis, which eventually prompt patients to seek medical attention.^[15] Indeed, laryngeal TB resembles laryngeal carcinoma on laryngoscopy and imaging, making histological confirmation essential.^[16]

CASE PRESENTATION

A 41-year-old man from Baghdad was referred by an Otorhinolaryngologist to the National TB Institute as a case of epiglottis TB with an apical lung lesion to start treatment. The patient was a heavy smoker for more than 20 years and presented with a change of voice, night sweats, and a fever of 4 weeks. Cough was also present, though the patient did not pay considerable attention and attributed it to smoking. These symptoms did not respond to simple symptomatic treatment. The patient consulted an ear, nose, and throat (ENT) specialist who found an epiglottis swelling by a direct laryngeal fibro-optic examination.

The complete blood counts and liver, renal, and thyroid function tests were within normal limits. A neck ultrasound examination showed a normal-sized smooth outlined left thyroid gland lobe with normal vascularity in the Doppler study with no calcification. In contrast, the right lobe contained a few hypoechoic nodules; the largest size was 3*4 mm of total cystic texture thin wall and internal comet tail artefact (colloid cyst) with non-significant peri-nodal vascularity without calcification. The isthmus was mildly enlarged (4 mm) and smoothly outlined, with normal vascularity in the Doppler study without space-occupying lesions. There was no retro-sternal extension of the thyroid gland. Also, there were multiple bilateral symmetrical well-defined enlarged lymph nodes seen in the upper cervical chain, mainly submandibular cervical, also along the internal jugular vein with intact central fat hilum, the largest one on the right side 28*7 mm (that goes with epiglottic lesion). Parotid and submandibular glands were normal, with a homogenous texture and no focal lesions. Cervical vessels and carotid sheath were normal.

Guided by ultrasound, a fine needle aspiration (FNA) was performed on the cervical lymph nodes. The histopathological examination revealed lymphoid elements, predominantly small mature lymphocytes, lymphoid series, and histiocytic cells. The findings were consistent with chronic reactive



Figure 1 | bilateral patchy heterogeneous air space opacification mainly involving the right upper and middle zones and left upper zone with fine reticular shadows and volume loss causing shifting of the trachea to the right and elevation of right hilum .

lymphadenitis.

A CT scan of the neck and upper chest with IV contrast showed evidence of focal thickening forming a mass-like lesion measuring about 11*4 mm involving the epiglottis, and the remaining laryngeal and pharyngeal structures were unremarkable. There were multiple bilateral oval cervical lymphadenopathies. The CT scan showed normal thyroid, parotid, and submandibular glands. The visualized part of the upper chest revealed nodular septal thickening with innumerable tiny nodules seen bilaterally. Posterior-Anterior (PA) chest X-ray showed bilateral patchy heterogeneous air space opacification mainly involving the right upper and middle zones and left upper zone with fine reticular shadows and volume loss causing shifting of the trachea to the right and elevation of right hilum (see **Figure 1**). Sputum examination for cytology and microbiology was unrevealing.

Squamous cell carcinoma was suspected, and surgery to excise the epiglottic mass was performed using a direct laryngoscope under microscopic magnification. Multiple pieces of tissue measuring 1 cm were sent for histopathological examination. The section showed contact squamous epithelium with an area of ulceration and underlying heavy lymphoid infiltration, epithelioid cell collection

trying to form a granuloma, and multiple necrosis with a destroyed salivary gland invaded by multiple granuloma-like structures without any evidence of malignancy. In conclusion, the histopathological findings revealed chronic granulomatous inflammation, which strongly suggested tuberculosis (TB) as the underlying cause. The patient was referred to the National TB Institute in Baghdad for further evaluation and confirmation. At the institute, a GeneXpert test was performed on both the sputum sample and a biopsy specimen. The results of both tests were positive for *Mycobacterium tuberculosis*, confirming the diagnosis of tuberculosis. This diagnostic confirmation provided the necessary basis for initiating the appropriate anti-tuberculosis treatment.

So, the patient was diagnosed as a case of epiglottitis with pulmonary tuberculosis. Antitubercular medication was prescribed for a complete course of 6 months duration started as 2 months initial phase with four tablets of combined fixed dose four drugs formula; Isoniazid 75 mg, Rifampicin 150 mg, Pyrazinamide 400 mg, and ethambutol 275 mg, followed by 4-month continuation phase with four tablets of combined fixed dose two drugs formula; Isoniazid 75 mg and Rifampicin 150 mg. The patient's monitoring during the treatment course was uneventful. Progressively, the patient became clinically well with no fever, no sweating, and improvement in the quality of voice at the end of his treatment course.

DISCUSSION

In 1882, Robert Koch quoted, "If the number of victims which a disease claims is the measure of its significance, then all diseases, particularly the most dreaded infectious diseases, such as bubonic plague, Asiatic cholera, etc., must rank far behind tuberculosis".^[17]

Our patient is a 41-year-old male from Baghdad. Studies have shown that males were involved 3 times more commonly than females ^[18] with a ratio of 1.9:1.^[19] Male predominant involvement may be because men engage in

more social activity than females. The mean age of involvement varies between 49^[20] and 51^[21] years in the literature.

Our patient presented with a change in voice, night sweats of 4 weeks duration with fever, and cough. He consulted an ENT physician, who found an epiglottis swelling by fibro optic examination of the larynx. Similarly, studies have shown that the main presenting symptoms of laryngeal TB are dysphonia, odenophagia, and cough. The diagnosis is usually confirmed with the identification of granulomatous inflammation, caseating granulomas, and acid-fast bacilli on histopathologic examination of biopsied laryngeal tissue.^[22,23] Hoarseness is the most common presenting symptom due to true vocal cord involvement.^[24] Laryngeal tuberculosis may cause mild hoarseness of voice to severe odynophagia and dyspnea due to laryngeal oedema and granulations.^[25] Pathologically, the vocal cords show diffuse whitish oedema, ulcerated lesions, and chondritis.^[26]

In laryngeal tuberculosis, diffuse thickening of the free margin of the epiglottis is a characteristic and common finding. However, despite extensive involvement of the laryngeal mucosa, there is no deep submucosal infiltration of the pre-epiglottic and para-laryngeal fat spaces.^[27]

Involvement of the larynx with tuberculosis is usually secondary to chest involvement, as it is in our case. So, Chest X-ray is recommended when dealing with a suspected laryngeal lesion to assess pulmonary involvement.^[28]

The ENTist expected malignancy as a cause of the laryngeal lesions; however, sputum for cytology was negative for abnormal cells and sputum for tuberculosis by genXpert was only done at the National TB Institute, which was positive. A high index of suspicion is required to reach a diagnosis without delay and to minimize the damage caused by the transmission of infection to exposed people.

The PA chest X-ray of our patient showed volume loss involving the right lung apex with a patchy heterogeneous area of air space

opacification suggestive of fibrotic changes with reticule nodular shadow involving the left upper and middle zone. However, some reported cases of laryngeal TB still had negative findings on radiological examinations of the chest and negative sputum cultures.^[29]

The CT appearances of laryngeal TB are non-specific; however, the possibility of laryngeal TB should be raised when bilateral and diffuse laryngeal lesions are encountered in patients with pulmonary TB.^[30] The usual CT findings of laryngeal TB are focal, regular thickening of the left vocal cord associated with irregular thickening of the posterior laryngeal wall.^[31] Our patient's neck and upper chest CT scan with IV contrast showed focal thickening, forming a mass-like lesion measuring about 11x4 mm involving the epiglottis. The remaining laryngeal and pharyngeal structures were unremarkable.

As our patient had, the proper management should involve a tissue biopsy for pathological examination, searching for caseous granulomas and detection of the causative agent, *M. tuberculosis*.^[32] On the assumption of the presence of squamous cell carcinoma, the decision for our patient initially was to excise the epiglottic mass through a direct laryngoscope under microscopic magnification. Misdiagnosis of laryngeal TB with laryngeal carcinoma is reported in the literature.^[33]

In our patient, finding caseous granulomas was the drive for the ENTist to think of laryngeal TB and a positive GenXpert for TB at our institute confirmed the diagnosis.

Treatment of laryngeal TB is a four-drug regimen including rifampin, isoniazid, pyrazinamide, and ethambutol, administered daily for two months, followed by isoniazid and rifampin for the rest of the course of 4 months.^[34] We used this treatment regimen for our patient uneventfully with progressive clinical improvement.

CONCLUSION

Laryngeal tuberculosis (TB) is a rare form

of extrapulmonary TB that primarily affects the vocal cords, epiglottis, and other parts of the larynx. It often presents with non-specific symptoms such as hoarseness, cough, and dysphagia, which can lead to delays in diagnosis. Histopathological examination, including biopsy and GeneXpert testing, is essential for confirming the diagnosis. Early identification and appropriate treatment with anti-tuberculosis medications are crucial to prevent complications and the spread of the infection.

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Abbreviations list: Compute tomography (CT), Ear, nose, and throat (ENT), Fine needle aspiration (FNA), Posterior-Anterior (PA), Tuberculosis (TB).

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