

A case of laryngeal tuberculosis mimicking supraglottic carcinoma in a pregnant patient and literature review

Deniz Baklaci¹, Anil Cakir Turhan², Müge Harma²

¹ Department of Otorhinolaryngology, Faculty of Medicine, Bulent Ecevit University, Zonguldak, Turkey

² Department of Gynecology and Obstetrics, Faculty of Medicine, Bulent Ecevit University, Zonguldak, Turkey

ORCID ID of the author(s)

BD: 0000-0001-8449-4965
CAT: 0000-0001-7976-4123
HM: 0000-0002-4327-674X

Abstract

Tuberculosis (TB) is the most common granulomatous disease, but laryngeal involvement is rare. The risk of developing this clinical form is higher in immunocompromised patients due to primary infection or reactivation of latent TB. Laryngeal TB can be misdiagnosed as laryngeal cancer since they have similar macroscopic lesions, and both cause dysphonia. We present a case of laryngeal TB in a 37-week pregnant patient who complained of dysphonia, odynophagia, and dysphagia. A mass with supraglottic carcinoma findings was discovered during a laryngoscopic examination. The reason for presenting this case is to emphasize the necessity for a high degree of suspicion for laryngeal TB involvement in patients with upper respiratory tract lesions in regions with high TB prevalence, to achieve early diagnosis and treatment.

Keywords: pregnancy, larynx, mass, tuberculosis

Introduction

Tuberculosis (TB) is a chronic bacterial infection caused by a species belonging to the *Mycobacterium tuberculosis* complex. In the second half of the 20th century, the incidence of TB significantly decreased due to the development of effective antituberculosis drugs, improved living standards, and various public health interventions. However, the incidence of TB is showing an increasing trend due to the growing prevalence of drug resistance, immunosuppressive conditions, poor living standards in some parts of the world, travel to developing countries, and the spread of human immunodeficiency virus infections. This trend suggests that laryngeal TB may become more common in the coming years [1].

Women are particularly vulnerable to TB during pregnancy, which is often attributed to immunological changes associated with pregnancy that provide an opportunity for mycobacterial infection or reactivation [2,3]. Compared to non-pregnant women, pregnant women are twice as likely to develop TB, and the disease typically progresses more rapidly and aggressively in this population [4-6].

Laryngeal TB is a rare form of extrapulmonary TB, accounting for less than 1% of all TB cases. The clinical presentation of laryngeal TB is similar to that of laryngeal cancer, and it can cause dysphonia, dysphagia, and dyspnea. Laryngeal edema and granulations can mimic laryngeal cancer, making diagnosis difficult.

This paper reports on a 37-year-old pregnant woman with laryngeal TB who presented to our emergency department with dysphonia, odynophagia, and dysphagia. During her laryngoscopic examination, a supraglottic mass was detected. We discuss our clinical approach and treatment management.

Corresponding Author

Deniz Baklaci

Department of Otorhinolaryngology, Zonguldak
Bülent Ecevit University, Faculty of Medicine,
Zonguldak, Turkey
E-mail: doktorent@gmail.com

Informed Consent

The authors stated that the written consent was obtained from the patient presented with images in the study.

Conflict of Interest

No conflict of interest was declared by the authors.

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Case presentation

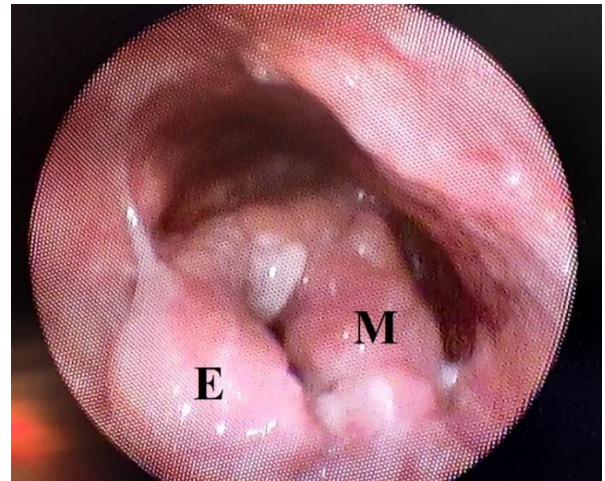
Written informed consent was obtained from the patient. A 37-year-old woman at 37 weeks gestation presented to our clinic with a 10-day history of sore throat, cough, dysphagia, and hoarseness. The patient had no significant medical or family history and had one previous cesarean delivery with a gravida of 2 and parity of 1. She reported no fever, night sweats, weight loss, or hemoptysis; her physical examination was unremarkable.

During rigid laryngoscopy, an ulcerovegetative mass lesion was observed, starting from the epiglottic laryngeal surface and extending to the aryepiglottic folds, arytenoid cartilage, and interarytenoid space. The mass involved the true and false vocal cords and hypopharynx, severely reducing airway patency (Fig. 1). Despite these findings, the patient did not exhibit respiratory distress, and her respiratory rate and blood oxygen saturation were within normal limits. The patient had a smoking history of approximately 20 pack/years. Given the possibility of laryngeal malignancy, direct laryngoscopy and biopsy was planned. After consultation with the obstetrics and gynecology clinic where she was being followed up, the patient was admitted to the hospital. Cold steam and 1 mg/kg steroid treatment were applied for laryngeal edema, and antibiotic treatment was initiated. If necessary, the patient and her relatives were informed about the possibility of emergency tracheotomy, and close respiratory distress monitoring was initiated.

Due to the patient's pregnancy, diagnostic tests such as the tuberculin skin test (purified protein derivative), chest X-ray, computed tomography, and magnetic resonance imaging were not performed. After consulting with the otolaryngology, gynecology, and obstetrics clinics, simultaneous cesarean section and biopsy under direct laryngoscopy were planned. The cesarean section was completed under spinal anesthesia without complications, and a healthy infant with an Apgar score of 9–10, weight of 3.490 g, and height of 50 cm was delivered. The patient was then intubated using a video laryngoscope with a size 5 endotracheal tube, and multiple punch biopsies were taken from many areas of the laryngeal mass under general anesthesia. The histopathological examination revealed necrotizing granulomatous inflammation with no evidence of malignancy.

Based on these findings, the patient was diagnosed with TB with laryngeal involvement, and the chest disease clinic was consulted. Acid-fast bacilli were detected in Ziehl-Neelsen staining of the patient's bronchoalveolar lavage (BAL) fluid, and *M. tuberculosis* was identified in the polymerase chain reaction (PCR) test of the BAL fluid. No pathological findings were observed in the histopathological examination of the placenta. The patient was started on treatment with isoniazid 300 mg/day, rifampicin 600 mg/day, pyrazinamide 1,500 mg/day, and ethambutol 1,400 mg/day. No serious side effects were observed during the treatment, and the patient was remotely interviewed once a month. At the end of the 6-month treatment period, follow-up examinations showed the resolution of symptoms and improvement of the mass.

Figure 1: Laryngoscopic image revealing the mass (M) starting from the epiglottis (E) laryngeal surface, extending to the aryepiglottic folds, arytenoid cartilage, and interarytenoid space, involving the true and false vocal cords. E: epiglottis; M: mass.



Discussion

TB is a significant non-obstetric cause of maternal mortality, with an estimated one-third of TB-related deaths occurring in women of childbearing age, predominantly in resource-limited countries [7]. Pregnancy-related changes in the immune system increase the risk of primary TB infection and the reactivation of latent disease. *M. tuberculosis* is the cause of TB, which typically affects the lungs. However, there is also a notable rise in head and neck infections, particularly in developing countries.

Extrapulmonary TB infection commonly affects the cervical lymph nodes (>90%) in the head and neck region, followed by the larynx (2–6%) [8,9]. Involvement of the eye, pharynx, thyroid, sinonasal region, temporal bone, and skull base is less frequent [8-10]. Laryngeal TB typically affects individuals in their 50s or 60s, and initial symptoms include hoarseness, followed by odynophagia, dysphagia, dyspnea, stridor, cough, and hemoptysis [11]. In the case being discussed, the patient's most prominent complaints were odynophagia and dysphonia.

Systemic symptoms are uncommon in laryngeal TB [9,10,12-16]. The primary mode of spread to the larynx and trachea is through expectorated sputum [13,16,17]. Distinguishing between laryngeal TB and laryngeal carcinoma can be challenging, but odynophagia is a significant distinguishing symptom, as it is rarely observed in laryngeal carcinoma [12-16]. During an endoscopic examination of the larynx, laryngeal TB most commonly affects the vocal cords, followed by the epiglottis, ventricular bands and ventricles, arytenoids, posterior commissure, and subglottis [10,15,17]. In addition to edema, hyperemia, or ulcerative lesions, laryngeal TB may also present as a nodule, exophytic mass, or obliteration of an anatomical structure [17]. In the present case, there was an ulceroproliferative mass involving the supraglottic larynx. Due to the absence of pathognomonic features indicative of laryngeal TB and the rarity of the disease in industrialized countries, it can be easily mistaken for laryngeal carcinoma, which is more common [14,18]. The differential diagnosis of laryngeal TB also includes Bartonellosis, syphilis, sarcoidosis, Wegener's granulomatosis, and fungal infections [8].

Laboratory techniques for detecting *M. tuberculosis* infections include sputum microscopy, sputum culture analysis,

tuberculous PCR testing in sputum or other body fluids, and demonstration of *M. tuberculosis* by histochemical staining in histopathological tissue examination. In the histopathological examination, calcified granulomas in the subepithelial stroma, showing central necrosis surrounded by epithelioid macrophages, Langhans giant cells, and lymphocytes, was a diagnostic finding. Although tomography and chest radiography findings can mimic many other diseases, they cannot diagnose laryngeal TB definitively. In the present case, the histopathological diagnosis revealed a necrotizing granulomatous lesion, and the PCR test of BAL fluid showed *M. tuberculosis*, which was consistent with laryngeal TB.

The World Health Organization recommends that the treatment of TB in pregnancy should be the same as in non-pregnant women. Exposure of the mother to drug therapy for TB does not pose a risk of congenital anomalies in the fetus, except streptomycin, which can cause ototoxicity [7]. Liver function testing before treatment and frequent follow-ups are essential. Pyridoxine supplementation is recommended for breastfeeding mothers and infants. The infants of mothers taking rifampicin while on isoniazid should also be given vitamin K at birth due to the risk of postpartum hemorrhage [4,19]. Generally, 6 months of treatment is sufficient for complete recovery [20,21]. Methylprednisolone can be used as a supplementary therapy in the presence of lymphadenopathy or laryngeal edema [22,23].

In the present case, cold steam and steroid treatment alleviated laryngeal edema. Tracheotomy may be required in patients with severe dyspnea or those with sequelae after medical treatment. However, a tracheotomy was not performed on our patient, as she responded to steroid and steam treatment, and no oxygenation disorder was observed during close follow-up. During treatment, odynophagia and pain are the first symptoms to resolve, while dysphonia improves as glottic lesions regress. Radiological and endoscopic signs take a few weeks to resolve [22]. If left untreated, laryngeal TB can lead to subglottic stenosis or vocal cord paralysis due to cricoarytenoid joint or recurrent laryngeal nerve invasion [13,17]. The transmission of TB from mother to infant can occur through the utero-hematogenous spread and aspiration of infected amniotic fluid. It can also be transmitted by contact with infected amniotic fluid or genital secretions during the intrapartum period, aerosol spread, or through infected breast milk from an active TB lesion in the breast during the postpartum period. Therefore, the infant should receive the BCG vaccine and isoniazid prophylaxis [7].

Conclusion

TB is a significant non-obstetric cause of maternal mortality, and TB during pregnancy rarely affects the larynx, with laryngeal involvement most commonly associated with pulmonary TB. In this case report, we presented a pregnant patient with pulmonary TB and laryngeal involvement to emphasize the need for a high degree of suspicion for laryngeal involvement in upper respiratory tract lesions to achieve early diagnosis and treatment in regions with high TB prevalence. Adopting a multidisciplinary approach involving relevant medical branches is crucial to prevent complications related to this disease in both the mother and the infant.

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