

## Laryngeal involvement in patients with active pulmonary tuberculosis

Murat Topak · Cagatay Oysu · Kursat Yelken ·  
Asli Sahin-Yilmaz · Mehmet Kulekci

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**Abstract** The aim of this study was to determine the incidence of laryngeal tuberculosis (LT) among patients with active pulmonary tuberculosis. A total of 319 patients under treatment for pulmonary tuberculosis were subjected to laryngoscopy. Five patients (1.5%) with LT were identified. Odynophagia was the most common complaint, followed by alteration in voice. The larynx returned to its normal appearance in 3–8 months (average 18 weeks) by antituberculous medication. Physicians dealing with pulmonary tuberculosis should keep in mind that symptoms of laryngeal involvement may be minor, and laryngoscopy should always be performed when laryngeal involvement is suspected in order to isolate highly infectious patients. Response to antituberculous medication is usually late in LT and diagnosis by “wait and watch” policy will cause a significant delay in the diagnosis of a possible larynx carcinoma.

**Keywords** Laryngeal tuberculosis · Pulmonary tuberculosis

### Introduction

Pulmonary tuberculosis remains a significant health problem in developing countries. Since 1990, tuberculosis has shown a rise in incidence worldwide and was declared a global emergency by the World Health Organization (WHO) in 1993 [1]. WHO reported 373,497 new tuberculosis cases in Europe in 2002, compared to 231,608 new cases in 1991 [1]. Pulmonary tuberculosis is an endemic disease in Turkey. The incidence of pulmonary tuberculosis was 28/100,000 in 1999 [2].

Laryngeal tuberculosis (LT) is one of the most common extra-pulmonary manifestations of this disease [3, 4]. The incidence of LT has significantly declined to the rate of 1.8, 1.5, and <1% in the last fifty years [3, 5–7]. The aim of this study is to determine the current incidence of laryngeal involvement in a relatively large group of patients with active pulmonary tuberculosis.

### Materials and methods

This study was conducted from January through September of the year 2003. 319 unselected patients with active pulmonary tuberculosis admitted in two major institutions of chest diseases in Istanbul were enrolled in the study. Active pulmonary tuberculosis was defined as positive sputum smear microscopy and/or culture [8]. In smears, detection of acid fast bacilli with the carbolfuchsin method (Ziehl–Neelsen stain) was considered positive. In cultures, mycobacterial growth in specimens inoculated onto egg-based culture media (Lowenstein–Jensen) was considered positive. The sputum specimens were subject to drug sensitivity testing on Lowenstein–Jensen medium if: (a) the patient had a previous history of tuberculosis infection, (b) if there was

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M. Topak · K. Yelken · A. Sahin-Yilmaz · M. Kulekci  
Department of Otolaryngology,  
Taksim Education and Research Hospital,  
Istanbul, Turkey

C. Oysu  
Department of Otolaryngology,  
Haydarpaşa Numune Education and Research Hospital,  
Istanbul, Turkey

C. Oysu (✉)  
Hacı Hakki Bey sk. Basel Ap. no.: 4/7,  
Erenköy, 34728 Istanbul, Turkey  
e-mail: coysu@doruk.net.tr

a clinical suspicion of multidrug resistant tuberculosis. If the smear or sputum culture was negative, the diagnosis was confirmed by positive tuberculin test results and/or radiological evidence of tuberculosis [8]. All the subjects had been receiving antituberculous medication including isoniazid, rifampicin and pyrazinamide with a duration varying from 2 weeks to 3 months at the time of inclusion.

All patients were subject to bedside indirect laryngoscopy by mirror or by endoscopic examination. The diagnosis of LT was established by biopsy and histological examination or rapid regression of the laryngeal lesions by antituberculous medication. Following the diagnosis of LT, patients were subject to query in detail in order to discover any neglected symptoms of LT. Taksim Education and Research Hospital ethical committee approved the study and we obtained informed consent from all subjects.

## Results

A total of 319 patients with pulmonary tuberculosis were examined. All of the patients were from lower socioeconomic classes. A total of 212 were living in rural areas. Totally, 273 were men, and 46 were women (male:female = 6:1). The age range was 14–80 years, with an average of 31.8 in men and 33.2 in women. Three hundred patients (94%) had a history of tobacco use and five (1.5%) were alcoholic. Totally, 249 of the patients were recently diagnosed with tuberculosis, and 70 (22%) patients were admitted due to reactivation of the disease.

Laryngeal involvement was identified in 5 out of 319 (1.5%). All the patients with laryngeal involvement were male and age-range was 25–46 years (mean 37.2). All patients were heavy smokers (mean: 22 packs/year). Only one patient had a history of heavy alcohol consumption. All patients had been under medical treatment for tuberculosis for 2 weeks to 3 months (mean: 7 weeks) prior to inclusion. Commonly observed constitutional symptoms included weight loss in all five patients and fatigue in four of the patients with laryngeal involvement. None of the patients reported fever. In four of the cases, a biopsy was performed and histological examination revealed chronic granulomatous infection. In the remaining one case with diffuse laryngeal inflammation and edema, diagnosis was made by rapid recovery of laryngeal lesions with medical therapy.

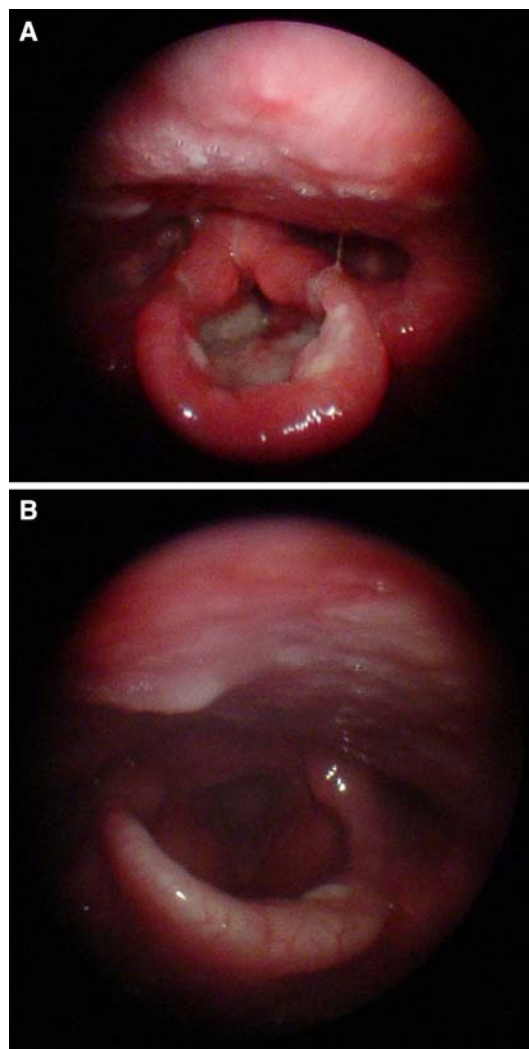
Laryngoscopic examination revealed lesions in the supraglottic area in all patients and involvement of the true vocal cords in case 2 (Table 1). Cases 1, 3 and 4 had an involvement of the epiglottis with an ulcerovegetative appearance (Fig. 1). The appearance of the lesion in case 2 was irregularity and edema. Case 5 had a granular lesion. In all cases except case 3, the larynx returned to its near normal appearance in 3–8 months (average 18 weeks); in case

**Table 1** The summary of clinical findings of five cases with laryngeal tuberculosis

Case	Age/sex	Duration <sup>a</sup>	Site of lesion
1	45/male	2 weeks	Ulcerovegetative lesion of epiglottis
2	28/male	8 weeks	Irregularity of right TVC and edema of the right FVC
3	25/male	3 weeks	Destructive ulcerovegetative lesion
4	42/male	7 years	Ulcerovegetative lesion of the epiglottis
5	46/male	15 years	Granular lesion of the right FVC

VC vocal cord, FVC false vocal cord, TVC true vocal cord

<sup>a</sup> The time interval between the date of initial pulmonary tuberculosis diagnosis and the date of laryngeal involvement diagnosis



**Fig. 1** This patient is a 48-year-old male with complaints of weight loss, fatigue,odynophagia, hemoptysis and foreign body sensation in the throat for the last 15 days. Diagnosis of laryngeal tuberculosis was confirmed by laryngeal biopsy. Endoscopic view at 2nd week of antituberculous medical therapy was as shown (a). Endoscopic view at 6 months of antituberculous medical therapy was as shown (b)

3, the tuberculous laryngitis healed in 8 months with sequel, but resulted in partial loss and scarring of the epiglottis.

The query of symptoms revealed that odynophagia was reported by all the patients. Mild to moderate changes in voice existed in three of the cases. Hemoptysis and foreign body sensation in the throat was reported by one patient each.

## Discussion

According to recent reports from the WHO, the situation of tuberculosis in the countries of central and eastern Europe is alarming [1]. As the incidence of tuberculosis increases, LT is encountered by an ever-increasing number of otolaryngologists and chest physicians [4]. The number of LT cases reported from industrialized countries remained low in the late twentieth century. Several studies reported an incidence of laryngeal involvement varying from <1% to 1.8% [5–7]. In developing countries such as Pakistan and Tanzania, the incidence of laryngeal involvement was reported to be higher and equal to 37% and 27%, respectively [4, 9]. In autopsies of patients who died of pulmonary tuberculosis, Fetterolf [10] showed laryngeal lesions in up to 83% in 1914. This finding suggests that it is difficult to estimate the exact current prevalence of LT among patients with pulmonary tuberculosis. It is likely that LT is more common than is clinically recognized. Our study revealed an incidence of asymptomatic LT among hospitalized patients with pulmonary tuberculosis of 1.5%. However, the patients included in this study had already received antituberculous medication, and it is possible that the incidence of LT would have been much higher if the patients were examined prior to therapy.

Our study supports findings that the male gender predominates among tuberculosis patients, a finding that has been reported both in pulmonary and extrapulmonary tuberculosis [11–13]. Lower socio-economic and cultural conditions and higher level of social activity have been postulated as factors that cause male predominance in tuberculosis [14]. Besides these factors, one cannot exclude the possibility of higher exposure to cigarette smoke in the male population of Turkey [15].

The most commonly reported symptom of LT is hoarseness, followed by sore throat and odynophagia, whereas most of our patients complained of odynophagia followed by alteration in voice [16]. Because our study was designed to scan unselected, asymptomatic cases, instead of hoarseness, minor symptoms such as odynophagia and mild to moderate changes in voice were predominant complaints. This situation may also be attributed to the fact that the supraglottic larynx was the predominant site of involve-

ment in our patients. Furthermore, the fact that all of our cases were under antituberculous medication might have affected the symptoms. Since all cases were heavy smokers, these symptoms may have been ignored by the patients and attributed to chronic laryngitis by the physicians. Because LT is the most infectious form of the disease, even minor symptoms in patients at risk should be taken into account by the physicians [17, 18].

Moreover, laryngeal carcinoma that may easily mimic LT or laryngeal carcinoma may concurrently exist with laryngeal or pulmonary tuberculosis [19]. Biopsy or rapid response to antituberculous treatment are two methods in the diagnosis of LT [20, 21]. Although biopsy is crucial for definitive diagnosis, the hazard of close proximity to the “highly infectious” patient during indirect laryngoscopy and biopsy may sometimes lead the physician to follow a “wait and watch” policy [21]. Contrary to our experience, there are reports that most lesions resolve over a 2-month period [6, 19, 20]. To our experience, a rapid response to the medication is possible only in a minority of the cases. In our study, only one of five cases showed a rapid response. It took our patients several months to get back to a near normal laryngeal appearance. For this reason, a “wait and watch” strategy will not be appropriate in patients with LT as it may cause a delay in diagnosis of laryngeal carcinoma.

## Conclusion

- The incidence of unrecognized LT among patients with active pulmonary tuberculosis is 1.5%.
- Physicians dealing with pulmonary tuberculosis should keep in mind that symptoms of laryngeal involvement may be minor, such as odynophagia and minor alteration in voice. In these cases, an otolaryngological examination should be performed. Early diagnosis of LT may protect the health care professionals from exposure to “highly infectious” patients.
- Laryngeal carcinoma may mimic LT. Response to antituberculous medication is usually late. Diagnosis by “wait and watch” policy will cause a significant delay in the diagnosis of larynx carcinoma. Therefore, early biopsy should always be considered.

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