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A clinical study on laryngeal manifestations of tuberculosis

Valli Rajasekaran[1]*, Srividhya G.[2]

[1]Department of otorhinolaryngology, [2]Department of Pulmonology, Shri Sathya Sai Medical College and Research Institute, Thiruporur, Chennai, Tamil Nadu, India

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***Correspondence:**
Dr. Valli Rajasekaran,
E-mail: valli_rajasekaran@yahoo.co.in

ABSTRACT

Background: In the recent years there is resurgence of tuberculosis and the presentation of the same has changed. Vocal cord paralysis can be due to involvement of vagus anywhere along its course. The lesions in the larynx can be the earliest presentation of tuberculosis.
Methods: A study has been done on all patients with tuberculosis with laryngeal lesions due to tuberculosis for a period of 6 months. These lesions were followed up and the resolution of these lesions and symptoms were documented.
Results: Vocal cord paralysis was the most common manifestation (66.6%). Tuberculosis of the larynx can be secondary to pulmonary tuberculosis or a primary manifestation. Vocal cord paralysis on the left side was due to mediastinal lesions and on the right side was due to apical fibrosis.
Conclusions: Vocal cord lesions due to active tuberculosis either nodal or parenchymal involvement usually recover completely with treatment. On the other hand, the lesions due to inactive lesions are likely to be permanent.

Keywords: Vocal cord paralysis, Laryngeal tuberculosis, Mediastinal node

INTRODUCTION

Tuberculosis is a disease often involving various organs, presenting with a wide variety of clinical manifestation. Laryngeal involvement in tuberculosis has been attributed to many reasons. It is usually considered to result from pulmonary tuberculosis (PT), although it might be localized in the larynx as a primary lesion without any pulmonary involvement.[1] Vocal cord paralysis owing to intrathoracic pathology in tuberculosis may be caused by three possible mechanisms a) Enlarged caseating mediastinal lymph nodes compressing the recurrent laryngeal nerve along the intrathoracic course / aortopulmonary window. b) Entrapment of the recurrent laryngeal nerve in the mediastinal fibrosis. c) Stretching of the nerve owing to retraction of the upper lobe bronchus towards the upper lobe in case of apical fibrosis.

Intrathoracic disease usually affects only the left recurrent laryngeal nerve because of its long intrathoracic course as it hooks around the aorta. The right recurrent laryngeal nerve hooks around subclavian artery and may be affected in apical pleural fibrosis or by supraclavicular lymph nodes (when left and right nerves are affected with equal frequency) or rarely mediastinal lymphnodes.[2-4]

As the prevalence of pulmonary tuberculosis has declined over the past few years, more extra pulmonary cases are being reported. Tuberculous lymphadenopathy is the most common form of extra pulmonary tuberculosis, of which hilar and mediastinal lymph nodes are more commonly affected.[5]

Laryngeal tuberculosis (LT) is the most common granulomatous disease of the larynx. The presentation of tuberculosis of larynx has changed over decades and there can be non-specific lesions in the larynx.[6,7] They are usually misdiagnosed as malignancy.[8] Although it can be treated successfully, tuberculosis of the larynx may cause irreversible fibrotic changes in the lamina propria of the vocal fold involved and may cause a permanent voice change.

Identifying the varying presentations of tuberculosis can help us identifying the disease early and initiating an appropriate treatment. This study aims to identify varying lesions in larynx due to tuberculosis and the reversibility of these lesions with antituberculous treatment.

METHODS

***Study place*:** Shri Sathya Sai Medical College and Research Institute.

***Study type*:** Longitudinal study

***Study duration*:** January 2016 – June 2016

The patients presenting to Pulmonology & ENT OPD who were treated or under treatment for pulmonary, mediastinal and laryngeal tuberculosis were included in the study. There were 108 patients during this period who were included in the study. All these patients were screened for pharngolaryngeal symptoms (voice change, breathing difficulty, painful swallowing, and throat pain). Among these patients 23 had laryngeal symptoms and findings on examination. Endolaryngeal examination was done in all patients. Only 9 patients had lesions in larynx secondary to tuberculosis. Other causes like oropharyngeal candidiasis, vocal nodule, and reflux laryngitis were excluded. Sputum AFB, Chest radiograph, HRCT chest was done in all cases of suspected mediastinal nodal/parenchymal disease. CT scan of neck was done in cases with laryngeal involvement. The causes of laryngeal symptoms were identified after investigations. Patients were started or continued on ATT after evaluation. Patients were followed up regularly and monthly laryngeal examination was done. The recovery of symptoms and signs were tabulated. Reversibility was taken as complete resolution of signs and symptoms.

RESULTS

Among the 108 patients who attended our OPD during the study duration, 23 patients had laryngeal symptoms. On further evaluation, 9 patients had lesions in larynx due to tuberculosis. The mean age of presentation was 39.2 yrs. Most of the patients were in the age group of 26-40 yrs (44.4%), followed by 41-55 yrs (33.3%). Most of patients were males (66.7%). The ratio of males to females was 2:1. All of these patients had voice change which was the most common presentation, followed by noisy breathing (33.3%) and odynophagia in (11.1%). Stridor was seen in patients with laryngeal tuberculosis (both primary and secondary). Systemic features were seen in both the patients with active pulmonary tuberculosis with secondary laryngeal involvement. Odynophagia was seen in only in 1 patient with secondary laryngeal tuberculosis (Table 1).

Table 1: Symptomatology in patients with laryngeal involvement.

Symptoms	No of patients (%)
Voice change	9 (100)
Noisy breathing	3 (33.3)
Systemic symptoms	2 (22.2)
Odynophagia	1 (11.1)

Table 2: Status of tuberculosis with vocal cord involvement.

Status of tuberculosis with vocal cord involvement	No. of patients
Active tuberculosis	6 (2 mediastinal lymphnode) / 1 endobronchial tuberculosis /2 secondary tuberculosis larnyx / 1 primary tuberculosis larynx)
Pulmonary tuberculosis sequelae (microbiologically inactive)	3 (2 parenchymal / 1 mediastinal lymphnode)

Of the 9 patients, 3 (33.3%) patients had vocal cord paralysis due to inactive disease (Table 2). 2 patients had healed fibrotic upper lobe entrapping the recurrent laryngeal nerve on the right and 1 patient healed calcified mediastinal lymph node involving left recurrent laryngeal nerve. All of these patients had an irreversible change in the larynx.

Among the 6 patients with active disease, 2 patients had tuberculous mediastinal lymphadenitis which was involving left recurrent laryngeal nerve.1 patient had enlarged mediastinal node at presentation which improved with ATT. The palsy recovered completely after treatment. Another patient who was diagnosed with tuberculous pleural effusion and was on ATT, developed left recurrent laryngeal nerve palsy after 6 weeks of ATT. HRCT chest showed multiple hilar and mediastinal nodes which was not evident on earlier imaging. On addition of oral steroids, the voice change and vocal cord palsy completely recovered within 4 weeks.1 patient had left mediastinal fibrothorax with endobronchial tuberculosis had involvement of left recurrent laryngeal nerve. The palsy improved partly with ATT (Tables 3-5).

All the patients with laryngeal tuberculosis, the diagnosis were confirmed with biopsy and histopathological

examination. 2 patients who had secondary laryngeal tuberculosis, the laryngeal symptoms developed 6 weeks after the symptoms of pulmonary tuberculosis. The lesions were involving both true and false vocal cords. There was involvement of arytenoid on one side in 1 patient and epiglottis in the other patient. The lesions resolved completely by 3 months of starting ATT and the voice recovered in 5 months. 1 patient who had primary laryngeal tuberculosis, had irregular proliferative lesions involving both vocal cords, sparing other parts of larynx. These lesions resolved completely and the voice improved after ATT by 4 months.

Table 3: Lesions in vocal cord.

Appearance of vocal cord	Cause	No.
Vocal cord palsy		
Right recurrent laryngeal nerve palsy	Right upper lobe fibrosis	2
Left recurrent laryngeal nerve palsy	Left mediastinal fibrosis with endobronchial tuberculosis	1
	Tuberculosis of mediastinal lymphnodes	1
	Tubercular pleural effusion with mediastinal node (paradoxical reaction)	1
	Calcified mediastinal lymphnodes	1
Diffuse papillary lesion involving both false and true vocal cords, right arytenoid	Secondary tuberculosis of larynx	1
Irregular proliferative lesion involving both true and false cords, congestion of part of laryngeal surface of epiglottis	Secondary tuberculosis of larynx	1
Reddish irregular proliferative lesion involving free border of both vocal cords	Primary tuberculosis of larynx	1

Table 4: Recovery of laryngeal lesions.

Recovery of lesions	No. of patients (%)
No recovery	3 (33.3)
Complete recovery	5 (55.5)
Partial recovery	1 (11.1)

Table 5: Duration taken for recovery of laryngeal lesions.

Duration taken for recovery	No. of patients
2-4 months	2 (mediastinal lymphnodes)
4-6 months	3 (secondary and primary tuberculosis larynx)
>6 months (partial recovery)	1 (endobronchial tuberculosis)

DISCUSSION

Larynx was commonly involved in tuberculosis of lung parenchyma or mediastinal nodes. It can also be affected primarily without underling lesion in lungs. The laryngeal manifestations were usually either vocal cord paralysis due to involvement of recurrent laryngeal nerve or tuberculosis of larynx. Lesions due to active disease usually resolved completely with treatment, but involvement due to inactive disease did not recover.

The recurrent laryngeal nerve could be involved due to tuberculosis in numerous ways. The left is commonly involved due to its long intrathoracic course**.** In our study, the left RLN was involved due to compression by mediastinal nodes in 3 patients and in 1 due to scar. The similar involvement of recurrent laryngeal nerve due to mediastinal lymphnode has been demonstrated in previous study where it was more due to direct extension of the tumour.[4,9,10] The right recurrent laryngeal nerve could be involved in right upper lobe fibrosis or rarely due to right mediastinal adenopathy.[6,11] In our study, both cases of right RLN involvement was due to upper lobe fibrosis.

Paradoxical reaction in tuberculosis is defined as clinical or radiological worsening of pre-existing lesions or development of new lesions in a patient who initially improves.[12] It was seen in one patient with tuberculous pleural effusion who developed hilar and mediastinal adenopathy. In this patient, the nodal size regressed on addition of oral steroids for 1month to ATT. In study by Breen et al, paradoxical reaction in tuberculosis treatment included lymph node involvement which improved with corticosteroids.[13]

The presentation of laryngeal tuberculosis was hoarseness or voice change in all our patients. Odynophagia was seen in only one patient with secondary tuberculosis of larynx. In the recent years, the common presentation was only hoarseness of voice and constitutional symptoms were less.[10] Odynophagia is not a common presentation of laryngeal tuberculosis in the recent years and was seen in only in 5% of patients in a study by Shin et al.[6]

The morphological appearance of tuberculosis of larynx has changed over decades.[6] There was involvement the entire length of anterior and posterior cord in all the patients. The classical involvement of posterior half of the larynx is less common. The lesions due to tuberculosis were proliferative or a papillary lesion. The classical ulcerative lesions were not seen in all the 3 patients. In a similar study by Ling et al, the lesions were more commonly seen along the vocal cord and the lesions were polpoidal, tumor like, papillary or congestion of vocal cord.[14]

The lesions in the larynx can be the first presentation of underling tuberculosis. The morphological appearance can simulate malignancy. A high index of suspicion can help us in early diagnosis and initiating an appropriate treatment. Vocal cord paralysis due to compression by mediastinal nodes and laryngeal tuberculosis usually recover completely.

CONCLUSION

The recurrent laryngeal nerve is commonly involved in thoracic tuberculosis both parenchymal and mediastinal node.

Laryngeal tuberculosis can be involved secondary to pulmonary lesions or sometimes be primarily involved without involving the lungs.

Most laryngeal manifestations due to active lesions resolve completely with treatment. The otolaryngologist must be aware of various changes in larynx in tuberculosis. Tuberculous etiology should be in mind in evaluating laryngeal lesions.

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