

# Atypical Primary Laryngeal Tuberculosis Presented With Mutational Falsetto: A Rare Case Report

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## Abstract

Tuberculosis is the most common granulomatous disease of the larynx, but still constitutes <1% of all cases of extra pulmonary tuberculosis. We report a case of 17-year-old male who presented with hoarseness of voice for 2 years. On local examination, we diagnosed as puberphonia (mutational falsetto) and voice therapy were advised. Patient reviewed after 3 months with progressive voice change, odynophagia, loss of weight, fever and ring lesion in left face. Video laryngoscopy was done for further examination and laryngeal swab was taken. On examination of the latter by fluorescent light emitting diode microscopy, patient was diagnosed to have typical primary laryngeal tuberculosis and treated with anti-tuberculous regime.

**Keywords:** Laryngeal tuberculosis, Light emitting diode microscopy, Mutational falsetto, Puberphonia

## INTRODUCTION

Tuberculosis is a contagious disease. The main mode of transmission occurs predominantly by droplet infection. It affects lungs primarily but can occur in any organ.<sup>1</sup> Among extra pulmonary tuberculosis, the most common manifestation is the lymphadenitis. In ENT, head and neck tuberculosis is rare in which the most common site is larynx excluding cervical lymphadenitis.<sup>2</sup> Tuberculosis is considered one of the most common granulomatous diseases of the larynx, but still constitutes <1% of all cases of extra pulmonary tuberculosis.<sup>3</sup> The diagnosis of laryngeal tuberculosis is challenging, as its presentation varies. Mutational falsetto is a functional voice disorder, being a failure to change from the high-pitched voice of preadolescence to the low-pitched voice of adolescence and adulthood in male.<sup>4</sup> We report a case of atypical primary laryngeal tuberculosis, which presented with mutational falsetto.

## CASE REPORT

A 17-year-old male patient came to the ENT outpatient department with the history of hoarseness of voice for 2 years which were high-pitched. ENT examination was

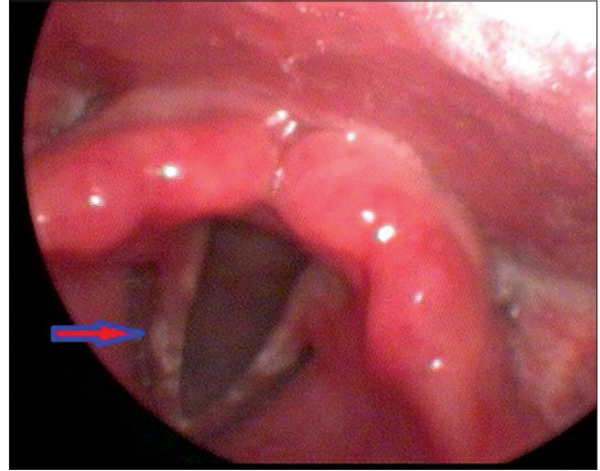
done. Video laryngoscopy using 45° rigid endoscope showed hooding of epiglottis (Figure 1), presence of phonatory gap during adduction (Figure 2) and normal-appearing vocal cords. Patient underwent voice assessment and speech profile showed high pitched voice, inadequate loudness, mild hoarseness and presence of pitch breaks. Maximum phonation duration shows 'a'-5 s, 't'-4 s, 'u'-4 s, 'z'-3 s. Hence, the patient was diagnosed as having puberphonia and was advised speech therapy. After 3 months, patient presented with progressive hoarseness of voice, odynophagia, fever, loss of weight and appetite and ring lesion in the left side of the face for 1 month duration. On local examination of the larynx, video laryngoscopy showed hooding of epiglottis with granulations, multiple bilateral ulcerations (mouse nibbled appearance) (Figure 3), bowing of true vocal cords and edema of the arytenoids and aryepiglottic folds (Figure 4). Dermatology opinion was obtained for lesion in face and impression was tinea infection (Figure 5). Mantoux test was positive (16 mm) (Figure 6) and sputum for acid-fast bacillus (AFB) by routine Ziehl-Neelsen method was negative. Basic laboratory tests including complete haemogram, blood sugar, renal function tests and liver function tests were normal except for elevated erythrocyte sedimentation rate (ESR) and lymphocytosis (Table 1). Plain film radiography of the chest posteroanterior view

was normal (Figure 7). A swab was taken from larynx with the help of 45° endoscope and examined under fluorescent light emitting diode (LED) microscope and tuberculous bacilli were clearly seen (Figure 8). Sputum culture done and was positive for *Mycobacterium tuberculosis*. Finally, the case was diagnosed as atypical

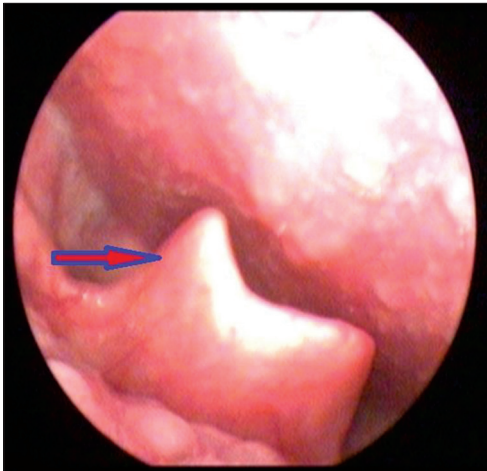
primary laryngeal tuberculosis. The patient was treated with anti-tuberculous regimen, topical clotrimazole cream for facial lesion and advised to continue speech therapy for 6 months. His family members were screened for tuberculosis contact.

**Table 1: His investigations are as follows**

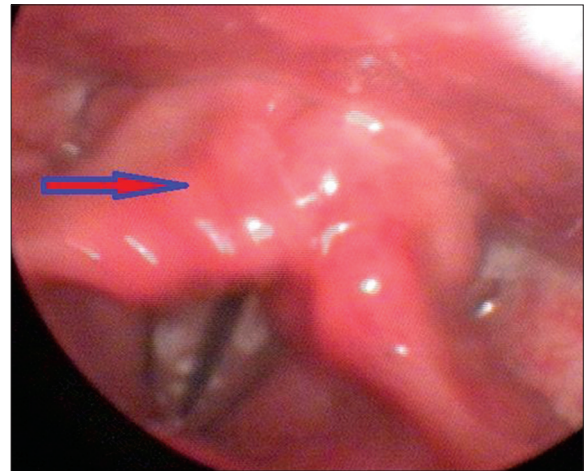
Hemoglobin	12 g
Total count	6200 cells/mm <sup>3</sup>
Differential count	P-42%, I-56%, e-2%
Erythrocyte sedimentation rate	66 mm/h
Platelet count	2.9 lakh/mm <sup>3</sup>
Random blood sugar	90 mg
Urea	21 mg
Creatinine	0.6 mg
Total bilirubin	0.9 mg
Direct bilirubin	0.6 mg
Aspartate transaminase	19 U
Alanine transaminase	23 U
Alkaline phosphatase	110 U
Serum albumin	4 g%
Total protein	7 g



**Figure 3: Mouse nibbled appearance**



**Figure 1: Hooded epiglottis**



**Figure 4: Arytenoids and aryepiglottic fold edematous**



**Figure 2: Phonatory gap present**



**Figure 5: Ring lesion**

## RESULTS

On the follow-up of the patient after 5 months, laryngeal lesions (Figure 9) and facial lesion (Figure 10) cleared up completely, repeat laryngeal swab examined under

LED microscope was negative for tuberculous bacilli (Figure 11) and voice became normal. The mode of presentation of typical primary laryngeal tuberculosis varies and in this case, it presented with mutational falsetto.



Figure 6: Moutaux test positive



Figure 9: Normal appearance of larynx

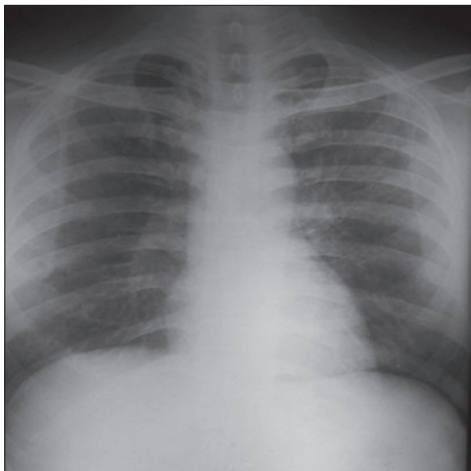


Figure 7: Chest radiography shows normal study



Figure 10: Ring lesion disappeared

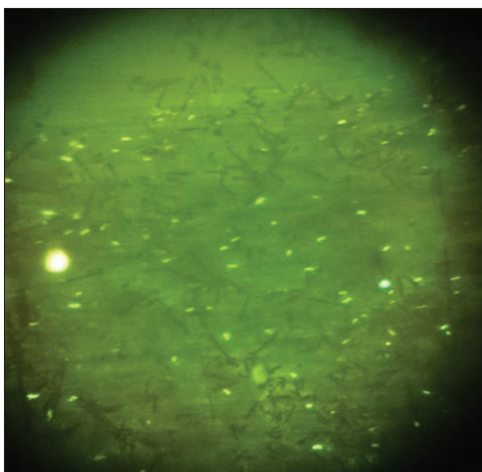


Figure 8: LED microscope shows presence of tuberculous bacillus

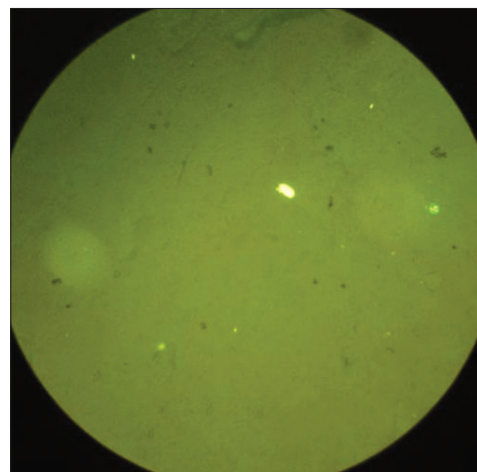


Figure 11: LED microscope shows negative for tuberculous bacillus

## DISCUSSION

The persistence of adolescent voice even after puberty in the absence of an organic cause is known as puberphonia. This condition is commonly seen in males. The patient has an unusually high-pitched voice persisting beyond puberty. This is uncommon in females because laryngeal growth spurt occurs commonly only in males.<sup>5</sup> Voice therapy is a behavioral method for changing the manner of voice production. Furthermore, the therapeutic techniques used in voice therapy may enhance wound healing following vocal fold injury. Voice therapy is an effective and appropriate method of treatment either as sole therapy for voice disorders or in conjunction with other treatment modalities.<sup>6</sup> The characteristics of laryngeal tuberculosis have changed over the years, and it has become a challenge for otolaryngologists to distinguish this disease from others. The laryngeal anatomy of individuals presenting with mutational falsetto appears to be normal, but in our patient it was not so.

The diagnosis of tuberculosis is suggested by a positive mantoux test, sputum for AFB, caseating granulomas on histopathological examination, classical radiological features, elevated ESR and positive AFB culture. However, we confirmed the diagnosis by using laryngeal swab examined under fluorescent LED microscope and AFB culture as confirmation is by identification of *M. tuberculosis*.<sup>7</sup> In LED microscope, fluorescent dye named auramine phenol is used as the primary stain and 0.1% potassium permanganate is used for counterstaining. LED microscopy provides a reliable alternative to conventional methods and has many favorable attributes that facilitate improved, decentralized, diagnostic services.<sup>8</sup>

Treatment includes direct observed treatment short course therapy according to the Revised National Tuberculosis Program Guidelines. Our patient, a newly diagnosed case of extra pulmonary tuberculosis, was treated under Category I regimen. It includes treatment with four drugs intensive phase for 2 months with isoniazid 300 mg, rifampicin 600 mg, pyrazinamide 1500 mg and ethambutol 1000 mg, followed by 4 months of the continuation phase

with isoniazid 300 mg and rifampicin 600 mg thrice a week. Although it seems difficult to detect laryngeal tuberculosis early, response to anti-tuberculous therapy is excellent in most of the patients.<sup>9</sup> Tuberculosis should be considered in the differential diagnosis of patients who present with any form of laryngeal lesion. Prompt diagnosis is important as a delay poses a significant public health risk.<sup>10</sup>

## CONCLUSION

Laryngeal tuberculosis is still a frequent complication of pulmonary tuberculosis. However, there can be primary laryngeal lesions without any pulmonary involvement, and this patient atypically seems to manifest as puberphonia that is very difficult to diagnose.

The successful management of typical laryngeal tuberculous patients, lies in a high degree of clinical suspicion, prompt diagnosis and early intervention by initiation of appropriate anti-tuberculous therapy.

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