

Laryngeal tuberculosis: a rare presentation in a Nigerian child with disseminated tuberculosis

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Tuberculosis (TB) remains a ravaging disease, particularly in the low-income countries, with a protean manifestation in children. Thus, a high index of suspicion is the key to clinching the diagnosis when presentation is in a rare form such as laryngeal TB. In this study, the case report of a 10-year-old female child with laryngeal TB in the setting of other typical clinical presentation associated with TB is highlighted.

Keywords:

children, disseminated tuberculosis, hoarseness, laryngeal tuberculosis

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Introduction

Tuberculosis (TB) has remained a disease of public health importance, infecting approximately a third of the global population, of which ~10% are children [1]. Although the lung is the most commonly affected organ in TB, the manifestation of TB is protean, affecting almost any other system, each with a potential of fatal outcome if not promptly and appropriately addressed [2]. The diagnosis of TB is challenging in children because of the difficulty of isolating the mycobacterium in them as well as the fact that TB simulates many other disease conditions in children. Furthermore, when the uncommon forms of TB are encountered as in the case of laryngeal tuberculosis (LTB), a high index of suspicion will be required in making the right diagnosis. However, the diagnosis of uncommon forms is aided when it occurs with other overt symptoms of TB [3].

LTB is a form of TB affecting either the intrinsic larynx (mainly around the vocal cords) or the extrinsic parts, including epiglottis, arytenoids, and aryepiglottic folds [4]. Since the postchemotherapy era, LTB has rarely been encountered in most European countries [5], though an appreciable number of cases are still being encountered in the developing countries [4]. The disease accounts for less than 2% of TB cases and affects mostly adults, with a low incidence in children globally [3]. This is possibly owing to the paucibacillary nature of TB in children, as LTB usually results from the invasion of the larynx by infected sputum from advanced pulmonary disease, which usually follows a high bacillary load, and less often from hematogenous spread [4,5]. In view of the rare occurrence of LTB in children, and with few case reports emanating on the disease from Africa [2,6,7], we highlight this case identified in a Nigerian child.

Case report

A 10-year-old girl was admitted with a 4-month history of cough and weight loss, hoarseness and right ear discharge of 2 months, and recurrent fever of 1 month.

Cough was nonparoxysmal with no periodicity, initially wet, and productive of mucoid sputum, there was no history of hemoptysis or chest pain, and cough progressively worsened and became brassy at onset of hoarseness. Weight loss occurred in spite of an initial good appetite; however, there was a history of anorexia three weeks before presentation. Hoarseness progressively worsened such that one could barely hear her utterances at presentation. There was no history of odynophagia, dysphagia, drooling of saliva, abnormal posturing, or preceding neck trauma. Fever was initially low, intermittent, but became high and persistent few days before presentation.

There was no history of contact with anyone with chronic cough. A history of child been immunized against TB was given, but no Bacille–Calmette–Guérin (BCG) scar was seen. She had used some oral medications prescribed at a private clinic with no improvement.

She is a primary fourth-grade pupil, third of five children in a monogamous family of low socioeconomic status, and the entire family lives in one room with a single window.

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At presentation, she was in respiratory distress (intercostal and subcostal recessions), moderately pale, febrile (38.7°C), had fluffy hair, and was wasted. She was not cyanosed (SpO₂, 90–95% in room air) and had grade III digital clubbing and generalized lymphadenopathy (submandibular, anterior cervical, axillary). Her weight was 16 kg, which was less than 50% of expected for age, whereas the height was 124 cm (>90% of expected for age).

She was tachypnoeic (respiratory rate of 40 breaths/min), had inspiratory stridor, trachea was central, and had a flattened left hemithorax with reduced chest expansion on same side. Tactile fremitus was increased in the left mid and lower zones, and percussion note was dull in the left hemithorax and in the right upper zone. The breath sound was reduced in intensity globally, whereas bronchial breath sound was heard in the right upper zone as well as the left mid and lower zones anteriorly. Coarse crepitations were heard on right upper zone anteriorly and bi-basally. Ear examination revealed bilateral tragal tenderness with purulent discharge and perforation of both tympanic membranes. She had tachycardia and tender hepatomegaly. Other systemic examination findings including fundoscopy were normal. Direct laryngoscopy revealed hyperemic and edematous left vocal cord with bulbous appearance and thickening of the arytenoids (Fig. 1).

Investigation results include packed cell volume of 15%, ESR of 73 mm/h, Mantoux reading of 20 mm, three sputum samples for acid alcohol fast bacilli were positive, whereas HIV screening was negative. A chest radiograph showed hilar adenopathy, mottling in lung fields, as well as an almost homogenous opacity in the left mid and lower zones with cavities on the right upper lung zone (Fig. 2). An anteroposterior cervical radiograph showed subglottic narrowing (Fig. 3). Ear swab microscopy and culture yielded *Pseudomonas aeruginosa*.

Based on the clinical, radiographic, and microbiological findings, a diagnosis of disseminated TB (miliary and laryngeal) was made. She had anti-tuberculosis drugs consisting of daily rifampicin, isoniazid, ethambutol, and pyrazinamide for 2 months followed by 4 months of rifampicin and isoniazid. She was also given oral prednisolone for 6 weeks. Aural toileting and antibiotics were given for the ear infection, whereas a pint of packed red blood cell was transfused to correct the severe anemia. She made progressive improvement clinically as well as in laboratory parameters. Mantoux test results for mother and two siblings who were available were 19, 9, and 0 mm, respectively.

Figure 1



Direct laryngoscopy shows hyperemic, edematous left vocal cord with bulbous appearance, and thickening of the arytenoids.

Figure 2



Chest radiograph shows mottling in lung fields, as well as an almost homogenous opacity in the left mid and lower zones with cavities on the right upper lung zone.

Figure 3



Cervical radiograph shows subglottic narrowing.

Discussion

LTB may either be primary or secondary, with a primary LTB referring to the absence of pathology in the lungs or any other site, whereas a secondary LTB refers to the presence of a pulmonary pathology [4,5]. The findings in our patient, where LTB coexisted with other forms of TB as reported some earlier cases [2,4,5,8], underscores the pathogenesis of LTB as a secondary disease. However, this finding differs from the report of Plessis and Hussey [4], where the laryngeal disease was the sole manifestation of the patient at presentation, and the diagnosis was almost missed. This presentation identifies the importance of a high index of suspicion, especially in areas less endemic with TB, as this could forestall further progression and complication of the disease [4], as well as reduce the risk of exposure to other patients and health care providers [3].

Hoarseness, the most commonly reported presenting symptom of LTB [9–11], was present in the index case but other symptoms identified in earlier reports include odynophagia, dysphagia, stridor, hemoptysis, and cough [9,10]. The laryngoscopic appearance varies and includes nonspecific inflammatory, polypoid, ulcerative, or ulcerofungative lesions [9,10]. Furthermore, the lesion site is variable; the vocal cords are most frequently involved followed by the vestibular folds, arytenoids, epiglottis, aryepiglottic folds, and interarytenoid region [11,12]. The index case had nonspecific inflammation of the vocal cords and arytenoids involvement which is also a major finding reported by Gandhi *et al.* [13].

The definitive diagnosis of LTB involves performing direct laryngoscopy and laryngeal biopsy with histopathologic features of epithelioid granulomas with Langhans-type giant cells and caseating granulomas as well as identification of the acid-fast bacilli [5]. However, supporting evidence of *Mycobacterium tuberculosis* infection in the setting of other forms of TB could also be used to establish the diagnosis, as was used in the index patient and some other reports [2,7]. Thus, the presence of a hoarse voice in a patient with other overt symptoms of TB such as chronic cough and weight loss should engender a suspicion of LTB. Possible differential diagnosis of LTB includes laryngeal papillomatosis and laryngeal carcinoma which presents with features of stridor, hoarseness, and dyspnea. However, a biopsy enables differentiation of these disease conditions, which is important as the management option differs.

The management of LTB involves the use of anti-tuberculosis drugs with excellent prognosis which was earlier reported [2–4,7–10,13] and observed in the index case. Indeed, a prompt

response to anti-tuberculosis drugs was considered an important diagnostic criteria for LTB, with a biopsy needed only if the response is incomplete [14]. There is still, however, a prevailing problem of late presentation particularly in developing countries as was depicted in the highlighted case and some earlier reports [2,4,5].

LTB has a high potential for spread of the disease, as well as that of a fatal outcome including the possibility of an upper airway obstruction or dissemination of the disease [1,3]. The reactive Mantoux tests among our patient's relatives underscore the high infectivity rate associated with LTB and extensive pulmonary lesions, as well as the importance of contact tracing; this is especially so with young children where an adult in the home is a potential source of reinfection if not sought out [1]. Thus, a need for increased awareness and surveillance system for early detection and treatment of TB is paramount for an even better outcome.

Conclusion

LTB is a rare manifestation in children. Thus, an increased awareness of its occurrence and a high index of suspicion in a child with hoarseness are important in clinching the diagnosis especially when manifesting as a primary TB disease.

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Conflicts of interest

There are no conflicts of interest.

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