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CASE REPORT

An Atypical Presentation of Extrapulmonary Tuberculosis with Acute Airway Obstruction Masquerading Laryngeal Carcinoma: A Case Report

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ABSTRAK

Tuberkulosis larinks primer (LTB) jarang berlaku. Kadar misdiagnosis adalah tinggi disebabkan oleh gejala yang tidak ketara. Laporan ini bertujuan untuk menyerlahkan aspek klinikal dan radiologi kes LTB, di mana pesakit mengalami ketumbuhan larinks dan gejala obstruktif saluran pernafasan atas akut. Seorang lelaki berumur 70 tahun hadir dengan stridor akut dan sesak nafas. Ketumbuhan subglotik dan halangan saluran udara yang ketara ditemui semasa pemeriksaan laringoskop. Ketumbuhan retro-trakeal berkesinambungan dengan esofagus toraks ditemui dalam pemeriksaan radiologi. Kekurangan gejala pulmonari dari klinikal aspek, serta hasil pemeriksaan tuberkulosis (TB) yang negatif termasuk biopsi untuk 'Acid-Fast Bacilli', telah secara kolektif mencenderungkan diagnosis awal ke arah kanser atau ketumbuhan. Cabaran kesukaran untuk mendapatkan biopsi pada ketumbuhan subglotik dengan pelbagai percubaan juga dibincangkan. Diagnosis LTB primer telah ditentukan selepas keputusan 'polymerase chain reaction' (PCR) positif diperolehi untuk Mycobacterium tuberculosis pada percubaan biopsi keempat. LTB mungkin dimanifestasikan dalam pelbagai gejala di larinks. Kajian ini menggariskan cabaran sewaktu mendiagnoskan LTB primer, di mana manifestasi halangan saluran pernafasan atas yang akut memerlukan pendekatan diagnostik yang komprehensif, kerjasama pakar perubatan interdisiplin, pematuhan kepada garis panduan rawatan yang ditetapkan serta pemantauan pesakit yang berterusan. Laporan ini menekankan keperluan pemeriksaan yang selanjutnya untuk LTB pada pesakit yang mengalami sebarang gejala saluran pernafasan atas terutamanya di kawasan endemik yang mempunyai prevalens TB yang tinggi, bagi mencapai diagnosis dan rawatan awal.

Kata kunci: *Halangan saluran pernafasan akut; gejala tidak tipikal; tibi ekstrapulmonari; tibi larinks*

ABSTRACT

Primary laryngeal tuberculosis (LTB) is rare. The misdiagnosis rate is high due to its vague symptoms. This report aimed to highlight the clinical and radiological aspects of a primary LTB case, where patient presented with laryngeal mass and acute upper airway obstructive symptoms. The challenges of diagnosis and insights learnt were shared which may facilitate prompt case management in the future. A 70-year-old man presented with acute stridor and dyspnoea. Multiple subglottic mass with significant airway obstruction was discovered during laryngoscope examination. The radiological evidence of

retro-tracheal mass appeared in continuity with thoracic oesophagus, the lack of clinical pulmonary symptom in addition to the negative general tuberculosis (TB) workup including biopsy for Acid-Fast Bacilli, had collectively led the initial working diagnosis towards malignancy. The challenges of difficulty in obtaining subglottic mass biopsy with multiple attempts were also discussed. The diagnosis of primary LTB was established after a positive polymerase chain reaction (PCR) result obtained for *Mycobacterium Tuberculosis* at forth biopsy attempt. LTB may be manifested in a variety of laryngeal symptoms. This study underscored the complexity inherent in diagnosing primary LTB, in which the presentation of acute upper airway obstruction deserved a comprehensive diagnostic approach, collaboration of diverse medical specialists, adherence to established treatment guidelines, and the crucial role of continuous patient monitoring. This report emphasised the necessity for a high degree of suspicion for LTB in patients presented with upper respiratory tract lesions especially within the endemic regions with high TB prevalence, to achieve early diagnosis and treatment.

Keywords: Acute airway obstruction; atypical presentation; extrapulmonary tuberculosis; laryngeal tuberculosis

INTRODUCTION

Extrapulmonary tuberculosis rarely presented at larynx, documented an incidence of <1% of overall tuberculosis cases with predominant occurrence among adults aged 40-60 years (Madolangan et al. 2024); up to 80% cases were misdiagnosed due to the lack in pathognomonic clinical symptoms. Laryngeal tuberculosis (LTB) often clinically manifested with hoarseness of voice (>75%), dysphonia, chronic cough and odynophagia (Cole et al. 2018). These vague symptoms may resemble common disorders of reflux or malignancy. The misdiagnosis rate is as high as 80% (Cole et al. 2018) and challenging as endoscopy of LTB often characterised by hypertrophic, exophytic and/or ulcerative lesions surrounded by erythema which mimics laryngeal malignancy (Madolangan et al. 2024; Migliorelli et al. 2022). Hence, its diagnosis is frequently a histological surprise. This report aimed to highlight the clinical and radiological aspects of primary LTB case, where patient presented with laryngeal mass with acute upper airway obstructive symptoms. The diagnosis challenges were also explored in order to share the insights learnt that may facilitate a prompt case management in the future.

CASE REPORT

A 70-year-old man, presented with sudden onset of stridor and dyspnoea. He denied of dysphagia, hoarseness, history of tuberculosis contacts nor constitutional symptoms. Neck examination showed a vague hard anterior neck fullness at thyroid level. Laryngoscopy examination revealed bilateral vocal cord abductor palsy and multiple subglottic mass with smooth surface at right lateral and anterior aspects causing significant airway obstruction (Figure 1 & 2). No ulcer or mass seen at subsites and neighbouring

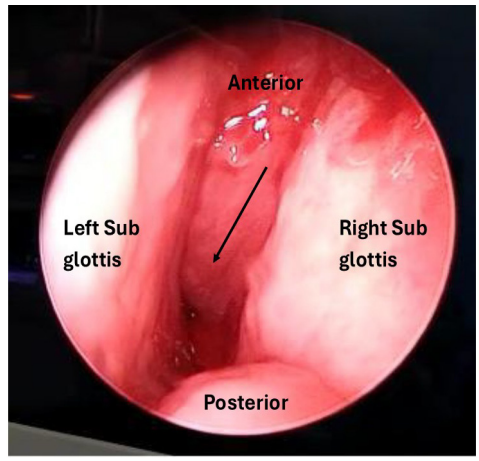

FIGURE 1: Laryngoscopy during acute presentation showed a subglottic mass at the true cord

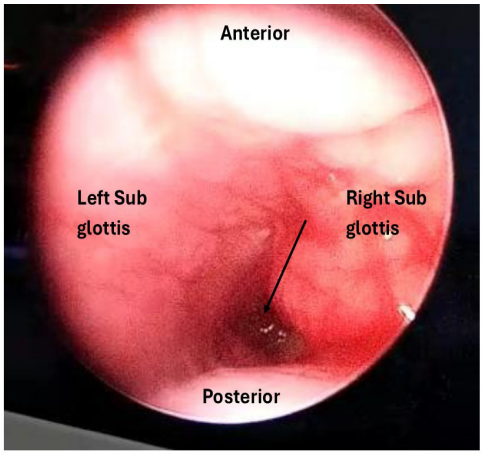

FIGURE 2: Subglottic narrowing could be visualised from the direct laryngoscopy

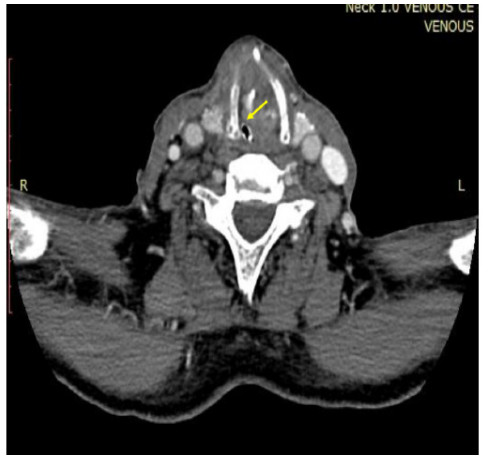

FIGURE 4: CT scan axial cut showed soft tissue edema at the subglottic region from the thyroid cartilage level, causing narrowing of the upper airway

structures. The first computed tomography (CT) neck showed hypodense soft tissue mass at retro-tracheal from C6/C7 level extending to T2 level, measuring approximately 1.8 cm x 1.4 cm x 4.8 cm (AP x W x CC), protruding into subglottic lumen, without clear demarcation with oesophagus, associated with adjacent enhancing lymph nodes (Figure 3 & 4). Inferiorly, this mass appeared in continuity with thoracic part of oesophagus. Superiorly, the glottis appeared swollen obliterating the vocal cords. Due to the acute upper airway obstruction with difficulty intubation, emergency tracheostomy was performed under local anaesthesia.

FIGURE 3: Sagittal view of CT scan neck showed retro pharyngeal soft tissue thickening with subglottic extension

Oesophagogastroduodenoscopy (OGDS) and barium swallow showed no significant abnormalities. Patient subsequently underwent direct laryngoscopy, tracheoscopy and neck exploration for tissues biopsy. The challenge of multiple biopsies was encountered, in which adequate tissue samples were difficult to be obtained due to limited accessibility. Given that patient had no pulmonary symptom in addition to the negative general tuberculosis (TB) workup, the initial leading diagnosis was towards cancer based on the friable and thickened soft tissue. TB was considered as differential diagnosis therefore biopsy was investigated only for Acid-fast Bacilli (AFB) without polymerase chain reaction (PCR) in the first two settings, considering the cost factor. Tissue for AFB were negative twice; the histological results showed only fibrotic tissues and signs of chronic inflammation. Tissue biopsy was attempted up to four times, and subglottic mass showed positive result for *Mycobacterium tuberculosis* from PCR which was sent during the forth biopsy. Patient was clinically stable post tracheotomy. CT neck was repeated after

5 months, revealed the persistent retro tracheal nodule and stable nodule posterior to right thyroid gland. The bilateral lungs were clear in CT chest, suggesting larynx as the primary site for infection.

Upon confirmation of provisional diagnosis, anti-TB regime was initiated by the internal medicine team. With the consideration of primary LTB as there was no evidence of the disease in any other organ or system, a standard 6-month anti-TB regime with a combination of isoniazid 75 mg, rifampicin 150 mg, pyrazinamide 400 mg and ethambutol 275 mg daily, was intensively started for 2 months followed by isoniazid and rifampicin for additional 4 months. Due to the atypical presentation of LTB, patient did not experience hoarseness or dysphagia therefore no noticeable impairment on voice and swallowing. Ryle's tube feeding was not indicated. Tracheostomy was decannulated 6 months post treatment after the mass had shrunk with radiological evidence of no significant subglottic obstruction.

DISCUSSION

LTB does not typically manifest as acute stridor, but it can be a delayed symptom when course of the illness progresses. During severe infections, 50-70% of the vocal cords and false cords will be inflamed, resulting in critical airway obstruction (Paulauskienė & Mickevičienė 2016). The respiratory distress might progress to respiratory arrest if unidentified and unmanaged promptly. The atypical appearance of the retropharyngeal node (RPN) was unusual for the patient's age group. This RPN, with its mass effect, could mislead a diagnosis toward thyroid malignancy. Additionally, poor differentiation between the lesion and the oesophagus could also skew suspicion towards an oesophageal tumour. Given these findings, performing both an OGDS and a barium swallow study was justified to thoroughly investigate and exclude the possibility of malignancy. While OGDS is the gold standard for direct visualisation of esophageal mucosa and obtaining biopsies for definitive diagnosis of esophageal cancer, having both barium swallow and OGDS can offer complementary value in improving the accuracy of diagnosis. In this case, due to the highly suspicious findings detected from CT scan, a preceding barium swallow provides broader anatomical and functional overview, for the anticipation of potential challenges during OGDS. Although less common, literature had also documented certain lesions might be better visualised with barium compared to endoscopic detection, hence this highlights the supplementary role of barium swallow (Chen et al. 2023; Elsayed et al. 2020).

Laryngeal mass could be attributed to benign lesion (papillomatosis, adenoma), infection (bacteria, fungal) and autoimmune lesions. Post tracheostomy, the size of the laryngeal mass of the patient remained insidious and static, making the diagnosis of aggressive tumour very unlikely. A slow indolent malignancy like adenocarcinoma might possible but rarely occurred in respiratory tract.

Majority of the LTB cases are secondary tuberculous lesion disseminated from primary site via haematogenous/lymphatic system. Primary LTB following inhaled tubercle bacilli which settling directly on larynx, is extremely rare. The existing reported cases of primary LTB presented with acute upper airway obstruction accounted for only 0.5-1% among population in developing countries (Benwill & Sarria 2014). Nevertheless, given that TB is an endemic disease in Malaysia despite *Bacillus Calmette–Guérin* (BCG) vaccination is mandatory in our national childhood immunisation program, physicians must have high index of suspicion although history of TB contact and constitutional symptoms are lacking (Kiakojuri & Hasanjani Roushan 2012).

LTB has numerous endoscopic presentation such as hyperaemic mucosa, ulceration, fungating mass, or leukoplakic changes. The features consistently mimicking malignancy. A complete TB workout must be performed simultaneously. Literatures had reported several cases of laryngeal squamous carcinoma coexist with LTB (Rajendran et al. 2017) which required sophisticated treatment approach. Given

that TB is a chronic disease, it is still able to progress aggressively, resulting in destruction of the surrounding soft tissues, cartilages and bone. An early and accurate diagnosis, prompt treatment and isolation are critical. Compared to conventional methods for TB detection like smear microscopy, culture, sensitivity testing and chest radiography, the PCR is more superior, rapid, with higher sensitivity (96%) and specificity (92%) (Wei et al. 2019). In an endemic region like Malaysia, a high degree of suspicion for TB is always necessary, even with atypical clinical or radiological manifestation. A more sensitive TB workup is highly needed in order to avoid treatment delayed, given that smear negative TB represents 30-60% of all TB cases, which cannot be detected by traditional smear microscopy (Campos et al. 2016). In order to overcome these diagnostic ambiguity and dilemma, previous Malaysian study has reported the superiority of GeneXpert tests (real-time PCR) for an early, rapid, sensitive and specific diagnosis, compared to the conventional AFB smears (Kabir et al. 2021). Therefore, the microbiological testing especially molecular assay like GeneXpert is a primary and crucial tool for diagnosing LTB and confirming the presence of *Mycobacterium tuberculosis*.

Stridor is life-threatening hence it requires immediate emergency management to establish a definitive airway. Tracheostomy for this patient was challenging due to bilateral vocal cords abductors palsy coexisted with subglottic narrowing; and anterior neck mass hence an integrated multidisciplinary approach is mandatory during the case management. Obtaining adequate tissue biopsy was another challenge. Multiple biopsies attempt from different sites are necessary for confirmatory histological analysis.

CONCLUSION

Primary LTB is possible without constitutional symptoms. All cases with laryngeal mass require a thorough head and neck examination followed by airway assessment. TB infection must be ruled out as a routine, together with optimal infectious control measures. Early diagnosis and treatment are helpful to prevent complications; and transmission of TB infection in the community. The successful resolution of this complex case offers important insights into negotiating the complex terrain of LTB and is a powerful tribute to the effectiveness of precision medicine and interdisciplinary teamwork.

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