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Case Report

Endobronchial tuberculosis presented as multiple endobronchial vesicular lesions

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ABSTRACT

Endobronchial tuberculosis (EBTB) is a tuberculous infection of the tracheobronchial tree with microbiological and histopathological evidence, with or without parenchymal involvement. EBTB commonly presents as acute or insidious onset cough, wheeze, low grade fever, and constitutional symptoms. In elderly patients, other differentials like malignancy and pneumonia may lead to misdiagnosis. Hence, bronchoscopy is essential for confirmation of EBTB. Here we report a rare presentation of EBTB in a 65 year old patient who presented with 3 months history of fever and cough and have multiple endobronchial vesicular lesions on bronchoscopy.

Introduction

Endobronchial tuberculosis (EBTB) is the tuberculous infection of the tracheobronchial tree supported by histopathological and microbiological evidence [1]. Various retrospective studies have reported an incidence of 6–50% [2–4], although one recent prospective study reported an incidence of 54.3% in patients with active pulmonary tuberculosis (TB) [5]. It has been known to occur via five potential mechanisms: (i) direct invasion from infected pulmonary parenchyma; (ii) hematogenous spread; (iii) via infected sputum; (iv) invasion via tuberculous mediastinal adenitis through erosion; and (v) lymphatic drainage [6]. In many cases, diagnosis and treatment may be delayed due to the presence of non-specific symptoms such as cough and wheezing and may be mistaken for bronchial asthma or pneumonia. Endoscopy is by far the best modality to diagnose EBTB [6] and often it cannot be offered to all patients undergoing a workup for pulmonary TB, a fact that makes diagnosis even more challenging. This study reports a rare case of EBTB presenting as multiple endobronchial vesicular lesions and was diagnosed using bronchoscopy.

Case

A 65-year-old gentleman with no known prior co-morbids, presented with a history of low-grade fever and dry cough

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for 3 months associated with a documented weight loss of 8 kg in the same period. He had taken multiple oral antibiotics which included amoxicillin, clarithromycin and levofloxacin; however, his fever persisted. He was a current smoker and had a history of moderate alcohol use in the past. There was a history of TB contact in the family. On examination, he had a lean build, afebrile, and had a blood pressure of 124/63 mm Hg, a heart rate of 82 beats/min and a respiratory rate of 22 breaths per minute. He was maintaining an oxygen saturation of 96% on room air. On auscultation, he had coarse crackles on the right lower lung zone. The rest of the systemic examination was normal. His initial laboratory investigations were normal except for borderline low calcium levels of 7.8 mg/dl and an elevated ESR which was 38. His chest X-ray showed subtle infiltrates in the right lower zone around the perihilar region (Fig. 1). His blood and urine cultures were negative. As he was not expectorating any sputum, a bronchoscopy was done. His bronchoscopy showed multiple shiny vesicular lesions anteriorly at the lower part of the trachea, at the beginning of the right main stem, right middle and right lower lobe bronchi (Figs. 2 and 3). Endobronchial biopsies were taken from these lesions and bronchoalveolar lavage (BAL) was done from the right middle and lower lobes. BAL was negative for Acid Fast Bacilli (AFB) smear, but the culture was positive for *Mycobacterium tuberculosis* (MTB) after 4 weeks. His BAL was negative for MTB on Genotype line probe assay using MTBDR*plus*. The cytopathology of the BAL was inconclusive. The histopathology of the vesicular lesions showed fragments of respiratory epithelium with severe acute and chronic non-specific inflammation along with ill-defined granulomas with multinucleated giant cells highly suggestive of chronic granulomatous inflammation, most likely TB (Fig. 4). He was started on a 4-drug anti-tuberculous treatment and had a significant clinical and radiological improvement within 2 months of treatment (Fig. 5). He continued to complete 6 months of antituberculous treatment.

The patient agreed to submit his case as a case report for publication.

Discussion

Endobronchial tuberculosis (EBTB) is one of the major complications of pulmonary TB. Most of the cases are reported to occur in people less than 35 years of age. In a recent study

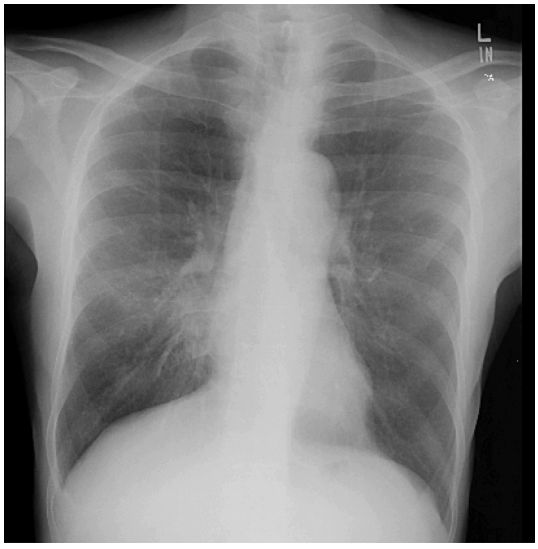

Fig. 1 – Chest X-ray on presentation showing subtle right perihilar infiltrates.

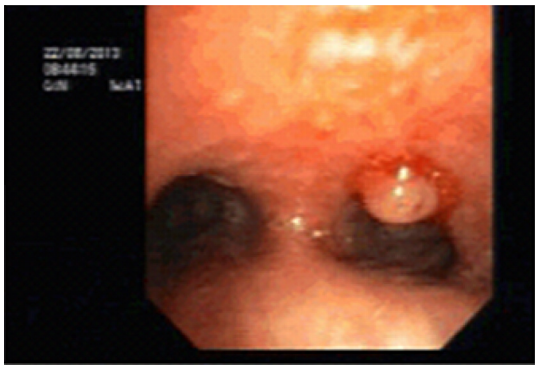

Fig. 2 – Opening of the right main stem bronchus at the carina showing shiny vesicular lesion.

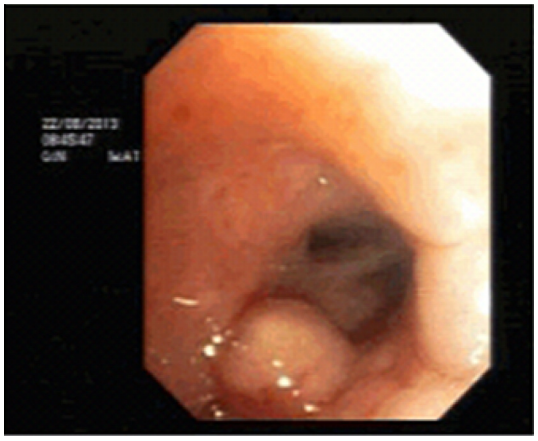

Fig. 3 – Right middle lobe bronchus showing similar shiny vesicular lesion.

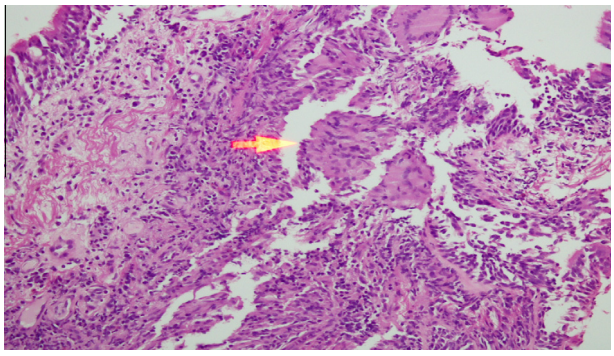

Fig. 4 – Bronchial biopsy; Histopathology H and E 20 × 10 of the vesicular lesions revealing multiple fragments of respiratory epithelium showing severe acute and chronic non-specific inflammation and granulomas. Arrow shows a granuloma with multinucleated giant cells.

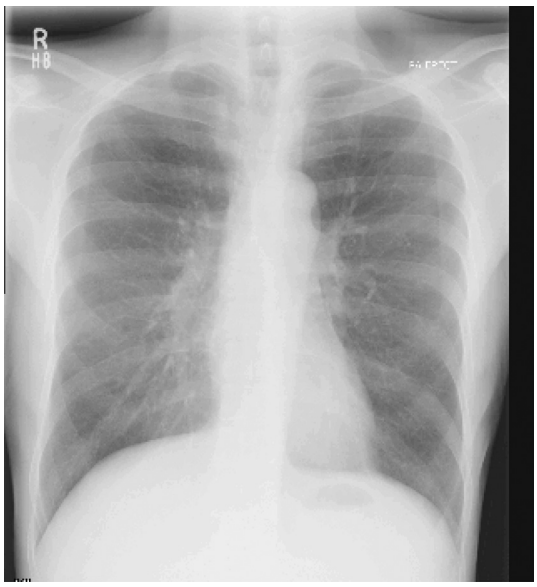

Fig. 5 – Chest X-ray after 2 months of anti-tuberculous therapy shows improvement in infiltrates.

done in Korea, female gender, no previous history of TB and a longer symptom duration (>4 weeks) were found to be independent predictors of concomitant EBTB with active TB. It also reported diabetes as the most common underlying disease followed by alcoholism and chronic lung disease (CLD) [5]. The symptoms include mainly cough, but can also present with fever, weight loss and hemoptysis. Some patients may be entirely asymptomatic [5,6].

Diagnosis is challenging for the clinicians as it may present with non-specific symptoms, such as cough, and may mimic other diseases like asthma, especially in the presence of a normal chest X-ray. Diagnostic work-up should commence with bacteriological confirmation in the sputum. Computed Tomography (CT) of the chest, particularly high resolution (HRCT), can provide valuable information regarding both the presence of the disease and the need for surgical intervention [6]. Endoscopy is the best modality to diagnose EBTB. It usually affects the lobar bronchi. Sputum positivity ranges from 16% to 53%. BAL is more sensitive than sputum smear microscopy, although the yield is still low in sputum smear-negative patients with EBTB; about 25% reported in a recent study [7].

Chung divided it into seven subtypes according to bronchoscopic features being actively caseating, fibrostenotic, edematous-hyperemic, tumorous, ulcerative, granular and non-specific bronchitic [2]. Presentation with multiple vesicular lesions as in this patient is rarely reported in literature. A recent study demonstrated that BAL fluid smear positivity and culture positivity ranges according to the sub-type, both being highest in the granular type (about 75%) [4]. Another study investigating the role of real-time polymerase chain reaction (PCR) on bronchial brushings found it to be more sensitive than smear microscopy, the sensitivities ranging between 75–94%, being the highest in the ulcerative type and the lowest in the tumorous type. The specificity was found to be 96% [8], indicating that it may be useful for the initial diagnosis and prompt treatment of the disease.

The prognosis of the actively caseating type and the edematous hyperemic type EBTB is worse, although relatively better for the granular, ulcerative, and nonspecific bronchitic types of EBTB [6]. Frequent complications include evolving of a fistula and bronchial stenosis and stricture formation, which develops in 60–90% of the cases [9,10]. Further complications due to stricture formation depends on the site involved; if in the trachea, it can lead to airway obstruction and stridor, while central bronchostenosis can eventually lead to bronchiectasis.

Treatment includes anti-tuberculous therapy for 6 months for non-MDR cases or according to sensitivity [6]. Corticosteroids have been used as an adjunctive therapy to prevent stenosis; however, its use has been controversial as some studies found it to be beneficial in children but no benefit was observed in adults [11]. Early diagnosis and prompt treatment is the mainstay of effective management and for preventing fibrosis and subsequent bronchostenosis.

Interventional bronchoscopy can initially be tried for management of bronchial stenosis with various techniques involving airway dilatation via balloon dilatation and airway stenting, ablation via electrocautery, argon plasma coagulation (APC), and laser therapy and cryosurgery [12–14]. The definitive management of bronchial stenosis after all the above fail is surgery and can include any of the procedures such as sleeve resection, end-to-end anastomosis and carinal resection depending on the site of stenosis [15].

Conclusion

EBTB is one of the frequent complications of pulmonary TB and can have grave consequences. EBTB may present as multiple endobronchial vesicular lesions. Bronchoscopy and histopathology are very helpful for early diagnosis. Early diagnosis and treatment can prevent future complications.

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Conflict of interest

None declared.

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