Research Paper

Volume : 4 | Issue : 8 | Aug 2015 • ISSN No 2277 - 8179

Endobronchial Tuberculosis: Case Report of A Diagnostic Challenge

Medical Science

KEYWORDS : Tuberculosis, endobronchial, chronic obstructive pulmonary disease

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ABSTRACT

Endobronchial tuberculosis (EBTB) is defined as tuberculous infection of the tracheobronchial tree. EBTB is difficult to diagnose because the lesion is not always evident in the chest radiograph and the disease may have insidious onset simulating chronic respiratory disorders such as chronic obstructive pulmonary disease (COPD). This report describes a case of EBTB which was misdiagnosed as COPD with frequent exacerbations.For early diagnosis, a high index of awareness of this disease is required and the bronchoscopy should be performed as soon as possible in suspected patients.

INTRODUCTION

Endobronchial tuberculosis (EBTB) is defined as tuberculous infection of the tracheobronchial tree with microbiological or histopathological evidence. EBTB may have insidious onset simulating bronchogenic carcinoma, chronic obstructive pulmonary disease (COPD), asthma or may be acute, mimicking foreign body aspiration and pneumonia **(1).** Thus, it may act as a diagnostic challenge and may cause delays in exact diagnosis and treatment.

We hereby present a case of EBTB which was misdiagnosed as COPD with frequent exacerbations.

CASE PRESENTATION

A 54-year-old male presented to our hospital with progressive dyspnea and dry cough. He had been diagnosed with COPD at internal medicine department of another hospital a year ago. Although he had been prescribed bronchodilators, he had a history of an increase in shortness of breath and dry cough affecting him especially since last five months. He had visited his doctor for three times in this period and he was hospitalized with acute exacerbations of COPD each time. He was an illiterate and had been working as a farmer. He was also suffering from rheumatoid arthritis since 3 years and receiving sulfasalazine (2 g/day). He had never consumed illicit drugs, had no allergies, and had no history of an alcohol addiction. His smoking history was 40 packs/year and he had been quitted smoking immediately after diagnosis of COPD.

On examination, blood pressure was 120/70 mmHg and electrocardiography was showing sinus tachycardia with a rate of about 110 beats/minute. Physical examination of the chest revealed wheezes in the lower zones of the both lungs. Examination of blood samples revealed leukocytosis (12000/mm3), lymphocytosis (9500/mm3), thrombocytosis (560000/mm3) and anemia (haemoglobin: 10.5 g/dl). Results of blood chemistry were within normal limits. Erythrocyte sedimentation rate was 110 mm/h and serum level of C-reactive protein was 2.5 mg/dl. Measurement of arterial blood gas analysis on room air revealed pH: 7.43, $PaCO_2$: 38 mmHg, PaO_2: 72 mmHg, HCO_3^-: 24 mmol/L and SaO_2: 96% which was compatible with mild hypoxemia. Tuberculin skin test was measured as 16 mm at the end of 72 hours and anti-HIV antibody tests were negative. Chest radiograph findings were including a paracardiac shadow along the right border of the heart **(Figure 1).** Computerized Tomography (CT) of the thorax demonstrated occlusion of the segmental bronchi in the right middle lobe of the lung with a consolidation containing air bronchograms and necrotic areas. In addition, there were paratracheal, paraaortic, paraesophageal enlarged lymph nodes whose greatest diameter was measured as 12 mm, and multiple centrilobular nodule formations in the different locations of the both lung parenchyma **(Figure 2).** Fiberoptic bronchoscopy (FOB) demonstrated near total occlusion of the right middle bronchus by a mucoid, tenacious, and thick cheese-like pseudomembrane completely lining the subsegments. The right middle bronchus appeared inflamed and contained increased secretions. Pathologic view of the forceps biopsy was consistent with caseating granuloma and M. tuberculosis was isolated from the bronchial aspiration fluid. Based on the radiological, microbiological and histopathological features, the patient was diagnosed as endobronchial tuberculosis and antimycobacterial treatment was initiated (Isoniazid 300 mg/day, Rifampicin 600 mg/day, Pyrazinamide 1500 mg/day, Ethambutol 1200 mg/day). The symptoms of the patient reduced one month after the initiation of antituberculosis treatment.

DISCUSSION

EBTB is an infectious disease that remains a diagnostic challenge which is present in 10-40% of patients with active pulmonary tuberculosis **(2).** EBTB usually starts as a submucosal tubercle that progresses to ulcer formation and granulation tissue that is generally formed looks like a polypoid mass. Five potential mechanisms have been suggested for the development of endobronchial infection: (a) direct extension from adjacent parenchymal focus; (b) implantation of organisms from the infected sputum; (c) hematogenous dissemination; (d) lymph node erosion into the bronchus; and (e) through lymphatic drainage from parenchyma to the peribronchial region **(3).**

EBTB is more common in young adults with a female predominance **(4, 5).** However, 15% of geriatric patients may also have EBTB **(6).** The common symptoms of EBTB include cough with or without expectoration, hemoptysis, breathlessness, and wheeze **(7).** The cough that is not responsive to an antitussive medication is also may be a feature of EBTB **(8).** EBTB is also a common cause of nonresolving consolidations and fever of unknown origin. The patient in this case had a long history of smoking, wheezes and progressive breathlessness which lead to misdiagnosis of COPD and it was a fault not to confirm the diagnosis with spirometry.

The main roentgenographic features of EBTB involve consolidation or loss of volume. However, 10-20% patients with EBTB may have a normal chest radiograph **(5).** Thus, a clear chest radiograph does not exclude the diagnosis of EBTB. Thorax-CT is more valuable in identifying endobronchial lesions. The most

common sites involved in EBTB are right upper lobe and right main bronchus. The localization of the lesions was right middle lobe in this case. Probably, chest radiograph of this patient was considered to be normal when he visited his doctor for several times and unfortunately further evaluation was not performed.

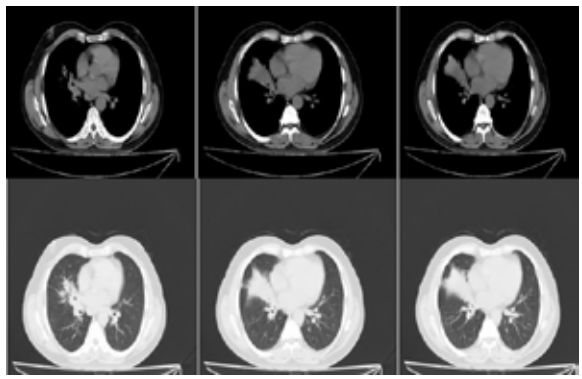
The key to the diagnosis of EBTB is a high index of suspicion and performance of diagnostic bronchoscopy. FOB can provide excellent material for diagnosis of suspected cases of EBTB **(8).** Even if bronchoscopic biopsy fails to supply tangible results, the bronchoscopic changes, supported by clinical and radiological findings may be sufficient to establish the diagnosis of EBTB **(9).** EBTB is divided into seven subtypes based on bronchoscopic appearance: (i) actively caseating, (ii) edematous-hyperemic, (iii) fibrostenotic, (iv) tumorous, (v) granular, (vi) ulcerative, and (vii) nonspecific bronchitis **(10).** Our case fulfilled the diagnostic appearance of actively caseating type of EBTB in view of a diffuse cheesy pseudomembrane.

Multidrug therapy still remains the cornerstone of all types of TB disease, as well as EBTB **(11).** Continuation of the treatment for 6 months is recommended **(11).** However, bronchial stenosis and strictures are irreversible, relatively common and delayed complications of EBTB occurring in spite of adequate antituberculosis treatment. Bronchostenosis may develop in 60-95% cases and may even involve the main stem bronchi **(1).** Actively caseating subtype is the most common form of EBTB as in this case, but its prognosis is usually grave resulting in fibrostenosis in two-thirds of the patients **(1).** Systemic corticosteroids, balloon dilatation, endobronchial stenting, and surgical interventions should be considered as an add-on to standard antituberculosis therapy in cases with bronchial stenosis **(12, 13).**

In conclusion, patients with chronic symptoms suggestive of COPD, poor response to COPD medications, and frequent exacerbations should be evaluated for compliance with bronchodilators, exposure to smoke or other environmental particles, other comorbidies that may have a significant impact on prognosis, and endobronchial lesions including EBTB.

Figure 1. Chest radiograph of the patient on admission

Figure 2. Thorax-CT images of the patient on admission



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