

# Endobronchial Tuberculosis

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**E**ndobronchial tuberculosis (EBTB) is an inflammation of the bronchial walls caused by tuberculous infection. The diagnosis is established by culture of a mycobacterium from bronchoscopic biopsy material. The clinical, radiologic, and bronchoscopic presentation of EBTB is nonspecific, and it can easily be confused with common pulmonary disorders. The disease can occur in patients of all ages, and higher incidence has been reported in patients with HIV infection.<sup>1</sup> This article presents the case of a 32-year-old woman with a nonproductive cough and shortness of breath in whom EBTB is diagnosed.

### CASE PRESENTATION

#### Patient Presentation

A 32-year-old woman with a history of seizure disorder was admitted to the hospital because of a 2-week history of nonproductive cough and progressive shortness of breath that had persisted over the past 2 months. She reported no symptoms of night sweats, hemoptysis, or weight loss, and she had no history of contact with tuberculosis. Her temperature was 98.4°F (36.9°C), blood pressure was 126/84 mm Hg, pulse rate was 78 bpm, and respiratory rate was 13 breaths/min. Results of the physical examination were unremarkable.

#### Diagnostic Testing

Radiography of the patient's chest revealed a left hilar mass (**Figure 1**). A computed tomographic scan of the chest with contrast showed an enlarged left hilar node with obstruction of the superior segment of the left lower lobe bronchus (**Figure 2**). The patient's purified protein derivative skin test was positive, with an induration of 24 mm. Her erythrocyte sedimentation rate was 82 mm/h. An HIV screen by Western blot was negative; the patient's angiotensin converting enzyme level was 41 U/L (normal, 14–40 U/L). Her complete blood count and serum electrolyte levels, including calcium levels, were within normal limits.

The patient underwent a diagnostic fiberoptic bronchoscopy, which showed complete occlusion of the superior segment of the left lower lobe by a mucosal sessile

fleshy lesion (**Figure 3**). Smears from bronchial washings were negative for acid-fast bacilli or other organisms. Biopsy specimens of the endobronchial lesion revealed multiple necrotizing granulomas without evidence of malignancy. After 4 weeks, culture results of transbronchial biopsy specimens were positive for *Mycobacterium tuberculosis*.

#### Treatment and Outcome

From the day of her admission to the hospital, the patient was treated with isoniazid, rifampicin, ethambutol, and pyrazinamide. Based on the sensitivity pattern, her treatment was narrowed to isoniazid and rifampicin for a duration of 6 months. Her condition progressively improved, and repeat chest radiography on follow-up examination 4 months later showed good resolution (**Figure 4**).

### DISCUSSION

#### Epidemiology and Etiology

Classically, EBTB has been thought to occur most frequently in young women, but some studies show a greater incidence in men.<sup>2</sup> The reported rate of occurrence of EBTB resulting from pulmonary parenchymal processes varies between 10% to 30% (as determined by bronchoscopy before initiation of antituberculous therapy) and 40% to 80% (as documented in autopsy reports<sup>3</sup>). EBTB can also result from residual bronchoganglionic lesions, contracted several years previously, in which the dormant bacilli regain activity.<sup>4</sup> This scenario may apply to the case patient, who had no evidence of parenchymal involvement.

#### Pathogenesis and Clinical Manifestations

The pathogenesis of EBTB has been variable and is still controversial. In children, EBTB occurs as a

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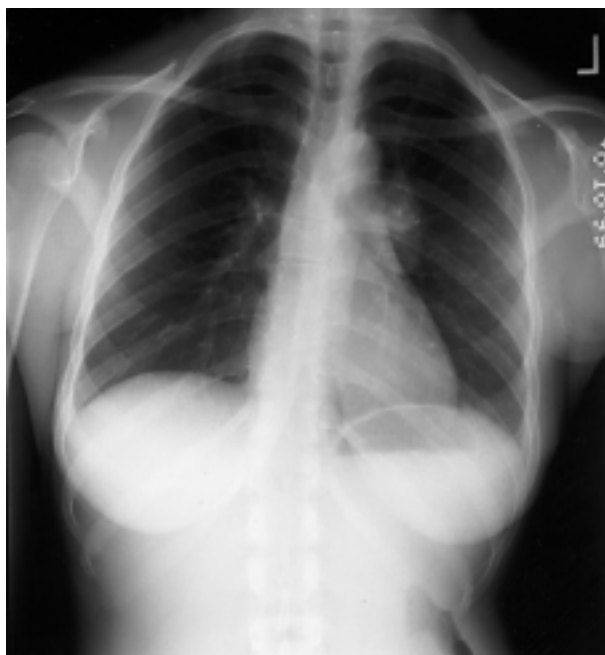


Figure 1. Chest radiograph of the case patient, showing a left hilar mass.

presentation of progressive primary tuberculosis from intrathoracic lymph node disease.<sup>5</sup> In adults, EBTB can occur as a result of postprimary involvement in which direct extension of the caseous material from adjacent parenchymal lesions causes the endobronchial lesion.

Endobronchial tuberculosis can present with a variety of nonspecific signs and symptoms, which include cough (usually nonproductive), dyspnea, anorexia, weight loss, hemoptysis, chest pain, and hoarseness. Localized wheezing can occur if there is a stenosing effect by the endobronchial lesion.<sup>6</sup> The classic symptoms of night sweats, fever, fatigue, and hemoptysis can occur if EBTB is the result of spread from adjacent parenchymal disease.

The radiologic findings of EBTB include evidence of lymphadenopathy, parenchymal disease process, consolidation/atelectasis, and obstructive emphysema. At times, the chest radiograph can show no abnormalities. The bronchoscopic findings may be actively caseating, edematous-hyperemic, fibrostenotic, tumorous (as seen in the case patient), granular, ulcerative, or non-specific bronchitic.<sup>7</sup>

#### Differential Diagnosis

Based on the clinical and radiologic findings, EBTB can be confused with sarcoidosis<sup>8</sup>; this potential confu-



Figure 2. Computed tomographic scan of the case patient's chest, showing an enlarged left hilar node with obstruction of the superior segment of the left lower lobe bronchus.

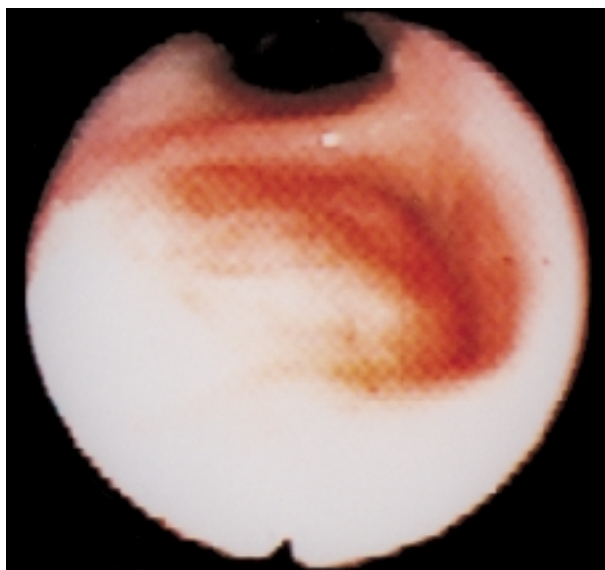
sion is problematic, because dissemination can occur if EBTB is empirically treated with corticosteroids. EBTB can also be mistaken for bronchial asthma,<sup>9</sup> lymphoma, Hodgkin's disease, or foreign body aspiration.<sup>10</sup> In elderly patients in particular, it can be mistaken for bronchogenic carcinoma, and both diagnoses must be conclusively evaluated because the diseases have been reported to coexist.<sup>11</sup>

#### Management

EBTB, like pulmonary tuberculosis, should be treated with combination chemotherapy comprising 3 to 4 antituberculous drugs administered initially for 2 to 3 months. Based on the sensitivity pattern, the regimen can be narrowed to 2 drugs administered for a total period of 6 months. The majority of patients with EBTB have negative results on sputum smears within 2 months of therapy.<sup>3</sup> Despite treatment, bronchial stenosis is a commonly reported complication of EBTB, and prospective studies evaluating the use of corticosteroids to prevent bronchial stenosis have not reported success.<sup>12</sup> Therefore, a high index of suspicion, appropriate diagnostic work-up, and prompt initiation of therapy is recommended in the management of this disease entity.

#### CONCLUSION

EBTB is a rarely reported disease that can mimic a variety of pulmonary disease processes. A high index of suspicion is necessary when making the diagnosis, especially in infiltrate-negative cases (as in the case patient). A purified protein derivative skin test, sputum sampling, diagnostic bronchoscopy with bronchial



**Figure 3.** Complete occlusion of the superior segment of the left lower lobe, as seen on fiberoptic bronchoscopy.

washings, endobronchial biopsies for acid-fast bacilli, sputum smear and culture, and initiation of antituberculous therapy should be performed in the appropriate clinical setting.

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**Figure 4.** Chest radiograph of the case patient at 4 months' follow-up.

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