

## Endobronchial actinomycosis caused by occult foreign body aspiration

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**A**ctinomyces israelii is the representative pathogen in human actinomycosis. It is a gram positive, anaerobic, slow growing, filamentous microorganism frequently found in oropharyngeal and gastrointestinal tract normal flora.<sup>1-3</sup> Thoracic actinomycosis accounts for approximately 20% of the cases.<sup>1,2</sup> Primary endobronchial actinomycosis is an exceptionally uncommon form,<sup>1,2</sup> but should be considered in chronic symptomatic cases, and malignancy or foreign body aspiration should be excluded by repeated fiberoptic bronchoscopy (FOB).

We report a case of primary endobronchial actinomycosis that mimicked bronchial carcinoma and was associated with foreign body aspiration.

### Case

A 67-year-old male patient was admitted to our department because of persistent cough, low-grade fever and night sweats for seven months. Prior to his admission he was treated with different antibiotics, but had no relief. He was a nonsmoker and had no history of alcohol abuse. He used a calcium antagonist medication for hypertension. He had undergone a glaucoma and cataract operation 2 years previously.

On admission, his physical examination was unremarkable except for the fine crackles heard at the basis of the right lung. Chest x-ray showed consolidation on the right lower paracardiac region. WBC was  $7 \times 10^6/L$ , hemoglobin was 12.8 g/dL, and the erythrocyte sedimentation rate was 19 mm/hr. Routine biochemical analysis of blood and pulmonary function tests were normal. Sputum cytology and smear for acid-fast bacilli were negative. Sputum aerobic and anaerobic cultures were also negative. Thorax CT revealed consolidation in the posterior segment of the right lower lobe, the lumen of the bronchus intermedius seemed to be narrowed, and there were multiple mediastinal calcified lymphadenopathies (Figure 1).

Flexible FOB (Olympus BF P40, Olympus Optical LTD, Japan) revealed irregular mucosal infiltration in the bronchus intermedius with patchy white necrosis and a yellowish white mass occluding 90% of the right lower lobe bronchus. Tissue biopsies of the bronchus intermedius revealed chronic inflammatory changes with necrosis, squamous metaplasia and granules containing *Actinomyces* colonies (Figure 2). Biopsy fragments of the mass lesion in the right lower lobe bronchus revealed massive necrosis. Treatment with

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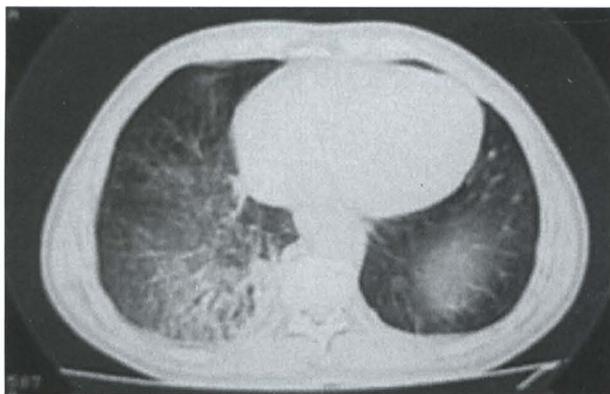
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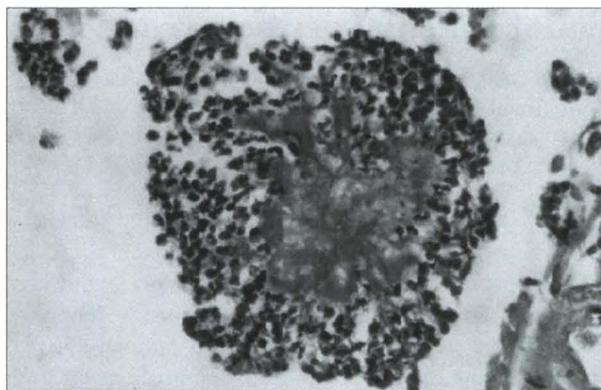
a macrolide antibiotic was started as the patient had used different penicillin-based medications before his admission to our department. Because of the probable coincidence of endobronchial actinomycosis and bronchial carcinoma, a second FOB was performed. Multiple mucosal biopsies from the bronchus intermedius, which revealed chronic inflammatory changes, were performed, but there was a regression in the occlusion in the right lower lobe bronchus and the yellowish white mass was found to be a foreign body covered with secretions (Figure 3). The patient expectorated a chicken bone shortly after the second FOB. Control CT and FOB performed two months later showed significant regression.

### Discussion

Human actinomycosis is usually caused by the bacterium *Actinomyces israelii*. The primary sites of infection are the cervicofacial region, thorax and abdomen. Thoracic actinomycosis accounts for 20% of human actinomycosis and usually involves the lung parenchyma as the infection is caused by the inhalation of contaminated aerosol particles.<sup>4,5</sup> Situations predisposing to actinomycosis are mainly debilitating states such as diabetes mellitus, malignancy, AIDS, mental retardation that facilitates foreign body aspiration, and poor dental hygiene.<sup>3,6</sup> Clinically the disease is characterized by an insidious presentation with a persistent cough, low-grade fever,



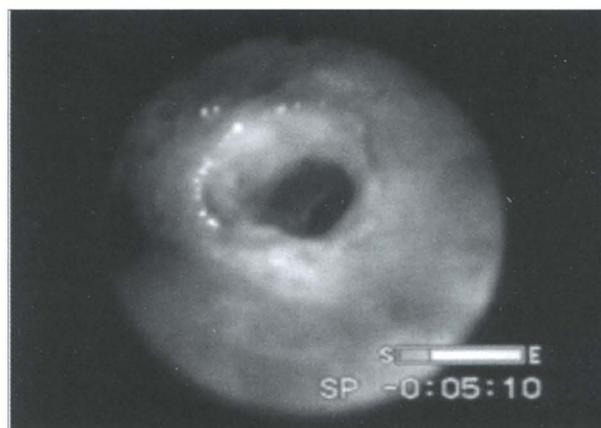
**Figure 1.** Consolidation in the posterior segment of the right lower lobe (thorax CT).



**Figure 2.** Granules containing *Actinomyces* colonies (HEX400).

dyspnoea, chest pain and sometimes haemoptysis.<sup>5,7</sup> In the advanced disease empyema, osteomyelitis of the ribs and spine, mediastinal involvement and chronic infiltrates with cavitations are the most common clinical and radiological manifestations.<sup>4</sup> Endobronchial actinomycosis is a very rare form. It may spread from an intrapulmonary disease into the bronchial submucosa or aspiration of contaminated material from the oral cavity may initiate the infection by distorting the bronchus and making the environment more suitable for the growth of *Actinomyces*.<sup>4,8,9</sup> Endobronchial actinomycosis frequently simulates bronchogenic carcinoma.<sup>10</sup> Our patient was a case of endobronchial actinomycosis associated with chicken bone aspiration. There was no history of choking in our patient, but this was not surprising as occult foreign body aspiration in adults can remain undetected for years. This is not a rare condition; choking history has been reported to be about 50% in adults.<sup>3,11</sup> In our case, as the disease onset was insidious with no history of choking and no sign of foreign body on chest radiograms, the suspected diagnosis was malignancy. The bronchoscopic view of irregular and necrotic mucosal infiltration of the bronchus intermedius and a yellowish white mass in the right lower lobe bronchus strongly mimicked bronchial carcinoma. Although *Actinomyces* colonies were detected histologically, a second FOB was performed to exclude the malignancy. The patient expectorated a foreign body detected in the second FOB shortly after the procedure.

We have found 13 endobronchial actinomycosis cases associated with foreign body aspiration in the medical literature.<sup>2,3,4,12</sup> All the patients were over the age of 55 years, with a male predominancy. The most frequent symptom was persistent cough. Poor dental hygiene was frequent among these cases, but there was neither poor oral hygiene nor a debilitating state in our case. As in our case, bronchial carcinoma was suspected in 50% of the cases. An endobronchial mass was reported in all the



**Figure 3.** Yellowish white lesion in the right lower lobe bronchus (chicken bone covered with mucus and granulation tissue) (fiberoptic bronchoscopy).

cases, but a foreign body was detected in only 45% in the first FOB. Pathologic examination revealed the definite diagnosis in all the cases, but microbiological cultures usually remained negative. The aspirated foreign body was a chicken bone in six cases and fish bone, bone fragments with a dental crown, grape seeds and beans in the others. The consolidation in the right lower lobe in our case disappeared shortly after the removal of the foreign body so it was regarded as a post-obstructive nonspecific pneumonic infiltration, and our case was regarded as endobronchial actinomycosis.

In conclusion, endobronchial actinomycosis is exceptionally rare but should be considered in chronic symptomatic cases. There may be an association with endobronchial benign or malignant lesions and foreign bodies. FOB is an essential diagnostic technique. Foreign body aspiration should be considered even in the absence of a choking history and should be excluded by a second FOB examination after the treatment of infection.

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