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*Clinical Problems*

# Primary Endobronchial Actinomycosis Simulating Bronchial Carcinoma in a Patient with Stroke

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**Abstract**

A 65-year-old hemiplegic man was presented with cough and dyspnea for five months. Fiberoptic bronchoscopy was performed because of hilar mass on his CT scan, with a presumptive diagnosis of bronchial carcinoma. Flexible bronchoscopy demonstrated an obstructing yellowish mass on intermediate bronchus. Histologic examination of the biopsy specimen demonstrated *Actinomyces* infection. The patient responded well to penicillin therapy, and endobronchial lesion resolved completely in three months. To our knowledge, the association of endobronchial actinomycosis with cerebrovascular disease has not been reported previously, and should be suspected in patients with neurological deficit with tendency to aspiration.

**Keywords:** endobronchial, actinomycosis, cerebrovascular disease, bronchogenic carcinoma

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## INTRODUCTION

Actinomycosis is a chronic suppurative infection of the cervicofacial region, lung, and abdomen. Aspiration of organism in patients with carious teeth and periodontal disease is usually the cause of thoracic actinomycosis [1]. Primary endobronchial actinomycosis is an uncommon mode of thoracic actinomycosis, and instead of suppurative infection produces sinus tracts and abscesses of lung and pleura. To our knowledge, there is no previous report of endobronchial actinomycosis in a hemiplegic patient. We present a case of primary endobronchial actinomycosis in a patient with past history of cerebrovascular disease (CVD).

## CASE REPORT

A 65-year-old man, hemiplegic because of CVD for eight months, was presented with cough, dyspnea and deteriorating general condition for the past five months. He was unable to bring up sputum. Physical examination revealed poor general condition, left hemiplegia, and absence of teeth. Auscultation of the lung revealed diminished breath sounds over the right lung. A leukocytosis of 12,500/mm$^3$ with neutrophilic predominance of 78% and a sedimentation rate of 40 mm/h were remarkable. The remainder of biochemical tests were within normal levels. Chest X-ray of the patient showed consolidation over the right paracardiac region. However, when the thorax computed tomography (CT) revealed a 3.5x2 cm mass partially obstructing the right intermediate bronchus (Figure 1) and consolidation over the posterior segment of the right lower lobe (Figure 2), a bronchoscopy was planned with a presumptive diagnosis of pulmonary carcinoma. Bronchoscopy revealed a yellowish endobronchial mass occluding the intermediate bronchus completely, and the purulent secretion was remarkable in the right bronchial system. Pathologic specimen taken over the endobronchial lesion disclosed filamentous *Actinomyces* colonies with abscess formation (Figures 3, 4). Second bronchoscopy performed a few days later showed the same result, and penicillin G (4 million units q.i.d.) was initiated with the diagnosis of endobronchial actinomycosis. The patient progressed, and dyspnea and cough resolved gradually in the follow-up visits. He was discharged with oral penicillin V one month later. Bronchoscopic examination performed three months later showed complete resolution of the endobronchial lesion. There was no mass or infiltration on the follow-up thorax CT (Figure 5). Oral penicillin V was continued for eight months. The patient is still alive and in good health one year after treatment.

## DISCUSSION

Actinomycosis is an indolent, slowly progressive bacterial infection caused by a variety of Gram-positive, anaerobic rods - most of which are of the genus *Actinomyces*. The disease can affect nearly every organ and body site, but its most significant characteristics are the formation of "sulfur granules" and the violation of normal tissue plane barriers as infection spreads and creates sinuses.

Endobronchial presentation of actinomycosis is a rare condition, but it has been increasingly reported in recent years [2-19]. The organism usually reaches the bronchial system via aspiration of the organism from the upper res-

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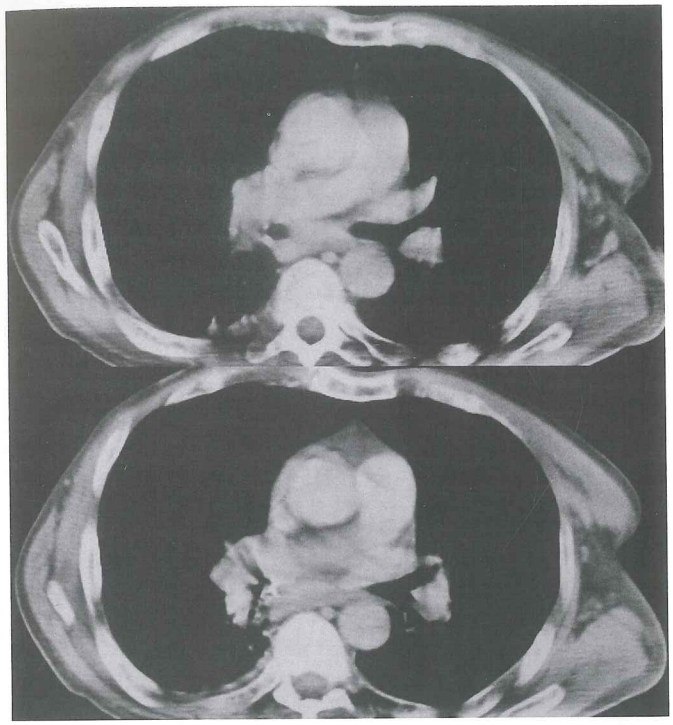

**Figure 1.** Thorax CT of the patient showing a mass lesion partially obstructing right intermediate bronchus.

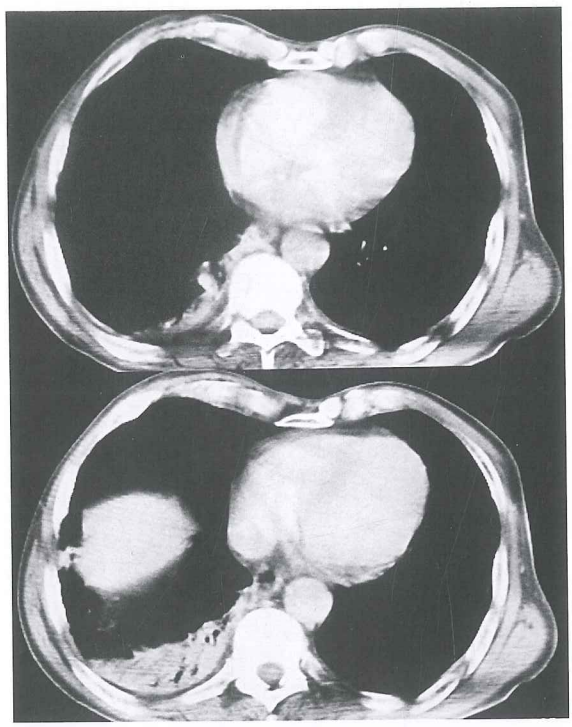

**Figure 2.** Thorax CT of the patient showing infiltration on posterior segment of right lower lobe.

piratory system. Carious teeth and periodontal disease are important risk factors for settlement of *Actinomyces* colonies in oropharyngeal mucosa. In most reports, endobronchial foreign bodies predisposed to endobronchial actinomycosis [3,4,7,10,14,16]. In these patients, endobronchial entry of *Actinomyces* organisms accompanied foreign bodies. In two of these cases, endobronchial lesions resulted from extension of intra-pulmonary disease [18,19]. In one other case, actinomycotic endobronchial lesions were overlying an endobronchial lipoma [15]. It therefore seems important to perform follow-up bronchoscopy after antibiotic therapy to exclude the presence of a foreign body or a benign tumor. Bronchoscopic resolution could be observed for as long as three months, as in our patient. Our patient had tendency to aspiration because of diminished gag reflex due to CVD. To date, there has been no reported case of pulmonary actinomycosis in a hemiplegic patient. But our patient did not have carious teeth or foreign body, which have been shown as important risk factors in the previous reports.

Definite diagnosis of pulmonary actinomycosis is usually based on demonstration of the typical filamentous mi-

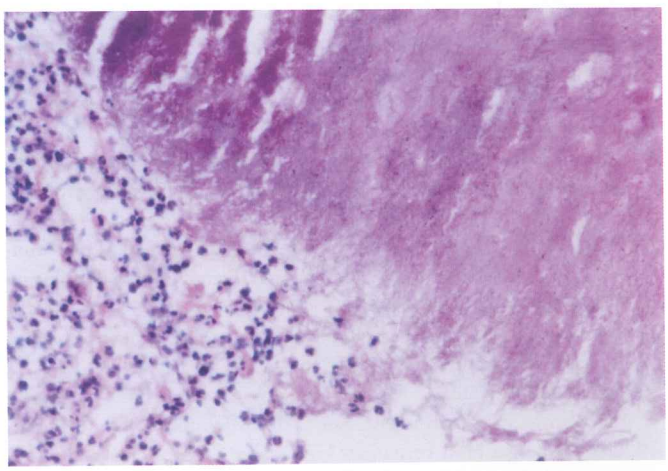

**Figure 3.** Dark-staining colonies of filamentous microorganism are remarkable with acute cellular inflammation (hematoxylin and eosin, original magnification x 200).

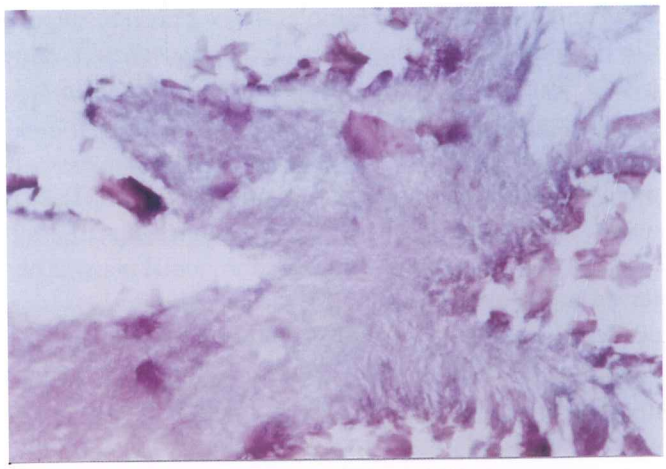

**Figure 4.** Bronchial biopsy shows eosonophilic materials in the peripheral portions of colonies (hematoxylin and eosin, original magnification x 400).

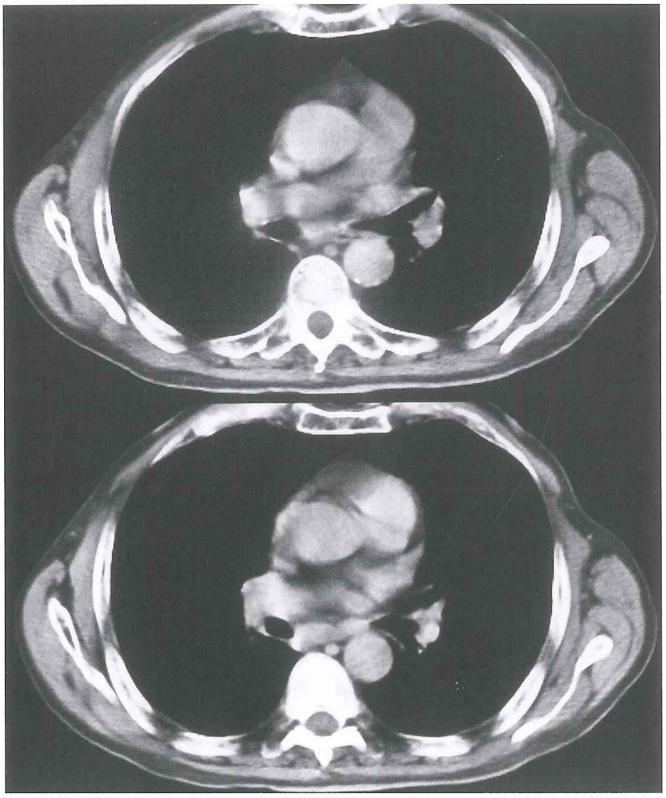

**Figure 5.** Thorax CT of the patient three months after treatment showing resolution of the mass and infiltration.

croorganisms on tissue specimen [3-9,11,13-15,17]. Culture is usually negative in endobronchial actinomycosis, as the microorganism is strictly anaerobic, and is frequently associated with non-aerobic contaminants. Nevertheless, since the organisms are part of the normal respiratory flora, a positive sputum culture is of little significance. The presence of granules in sputum is suggestive of diagnosis, but they are seldom found. We diagnosed *Actinomyces* on bronchial biopsy. The hallmark of actinomycosis is the presence of sulfur granules, but diagnosis is sometimes difficult in small and crushed biopsy samples. In one previous report, the diagnosis of endobronchial actinomycosis was done with a Wang needle aspiration of the mass when forceps biopsy was nondiagnostic [5].

The endobronchial presentation of actinomycosis is usually as mass lesion that at first mimics bronchial carcinoma. The typical endobronchial appearance of actinomycosis is a yellowish, obstructing endobronchial mass, as observed in our case [4,5,8,14,15]. In fact, surgical excision of such a mass because of suspicion of malignancy is not a rare mode of diagnosis [1]. In most cases, the right side is more frequently affected, probably because of easy settlement of aspirated organisms to the right bronchial system, as in our case [4-9,11,14,17].

In conclusion, there are two important distinguishing features of our case. The first is the endobronchial presentation of the case, which is a very rare form of the disease, with a diagnosis by bronchoscopic biopsy. The second is primary endobronchial actinomycosis presenting in an hemiplegic patient, which has not been reported previously. Once the diagnosis is definite in endobronchial actinomycosis, the prognosis of the disease is excellent with antibiotic therapy.

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