CASE REPORT

Pulmonary actinomycosis masquerading as lung cancer: A case report

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SUMMARY

Pulmonary actinomycosis is a rare yet important and challenging diagnosis to make. It is commonly confused with other lung diseases, such as tuberculosis and bronchogenic carcinoma, leading to delay diagnosis or misdiagnosis. A 49-year-old man presented with a chronic cough, hemoptysis, and pleuritic chest pain. His initial imaging studies including computed tomography (CT) was suggestive of bronchogenic carcinoma. A subsequent CT-guided biopsy was consistent with pulmonary actinomycosis and excluded the possibility of bronchogenic carcinoma. He was treated with antibiotic therapy and achieved remission with complete radiological resolution upon follow-up.

KEY WORDS:
Pulmonary actinomycosis, lung malignancy, bronchogenic carcinoma

INTRODUCTION

Actinomycosis is a rare, chronic granulomatous infection caused by *Actinomyces spp*. These gram-positive, non-spore forming, anaerobic bacteria belonging to the family of *Actinomyceataceae*.[1] Actinomyces are normal commensals of the human oropharynx, gastrointestinal tract, and female genitalia. Cervicofacial infection accounts for the majority of the cases while 15% may present with thoracic involvement.[2] Pulmonary actinomycosis most commonly occurs following aspiration of oral bacteria in saliva. It is a rare yet important and challenging diagnosis to make. It is commonly confused with other lung diseases such as tuberculosis or bronchogenic carcinoma, leading to delay diagnosis or misdiagnosis. Here, we report a case of pulmonary actinomycosis masquerading as lung cancer.

CASE DESCRIPTION

A 49-year-old man presented with a one-month history of a cough, hemoptysis, and left-sided chest pain. He did not experience any constitutional symptoms. He was a chronic smoker and owned a dairy farm. He had a history of recurrent gingivitis for the past two years with no proper dental follow-up.

Upon arrival, his vital signs were stable. Respiratory examination showed no cervical lymphadenopathy but reduced breath sound over the left lung field with stony dullness on percussion. Oral examination revealed the presence of gingivitis. Otherwise, cardiovascular and abdominal examinations were unremarkable.

His initial blood investigation showed leucocytosis ($22x10^9$/L) with neutrophilia and thrombocytosis ($611x10^9$/L). His hemoglobin level was normal. Other blood investigations yielded a normal renal profile and liver function. Chest radiography showed left-sided pleural effusion with suspicious mass over the left upper lobe (Figure 1a). Contrast-enhanced computed tomography (CT) showed a mass over the left lower zone with satellite lesion over the left upper zone, and left basal loculated effusion, which was highly suspicious of malignancy. However, cytology of sputum and transbronchial biopsy were negative for malignant cells. Cultures from sputum and bronchoalveolar lavage samples were also negative for bacterial, tuberculous or fungal infection. A CT-guided biopsy was carried out over the left lung mass and pathological examination demonstrated an extensive area of necrosis with neutrophilic infiltrations, reactive interstitial fibrosis, and clusters of *Actinomyces* were observed (Figure 2).

He was diagnosed with pulmonary actinomycosis and was started on intravenous penicillin 16 Megaunit/day for six weeks duration. His clinical condition and radiological findings (Figure 1b) improved significantly with treatment and was discharged with oral penicillin for another four months. Complete remission was achieved and the patient was clinically well during subsequent follow-up.

DISCUSSION

Pulmonary actinomycosis accounts for 15% of all actinomycosis with a bimodal age distribution, and a peak incidence in the fourth and fifth decades.[3] The incidence of infection is two to four times greater in males compared to females. Risk factors reported previously were underlying respiratory disorders and in alcoholics.[3] It most commonly affects the lungs following aspiration of oral bacteria in saliva. Actinomyces meyeri has been shown to have a

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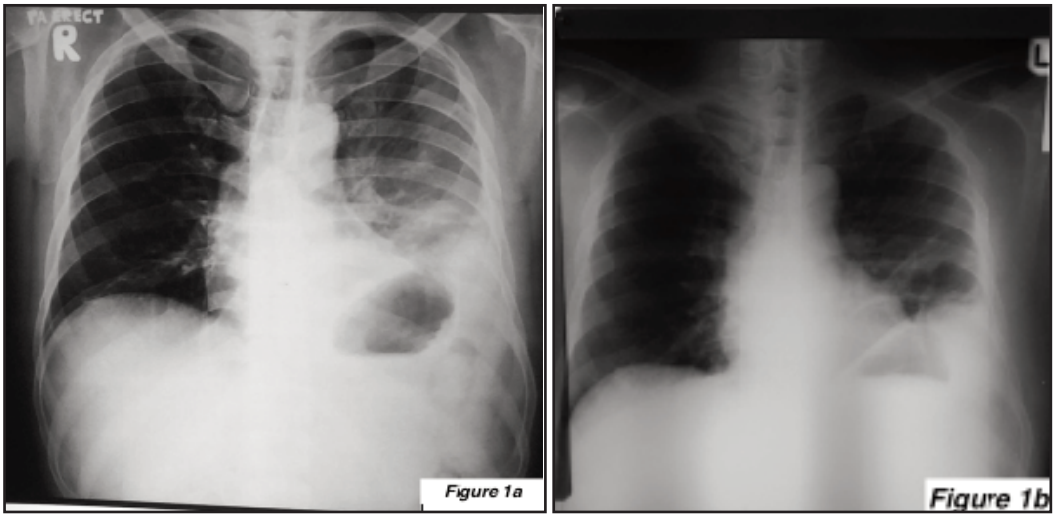

Fig. 1: Chest radiography showed left-sided pleural effusion with suspicious mass over the left upper lobe (a) with significant improvement 6 weeks after antibiotic therapy (b).

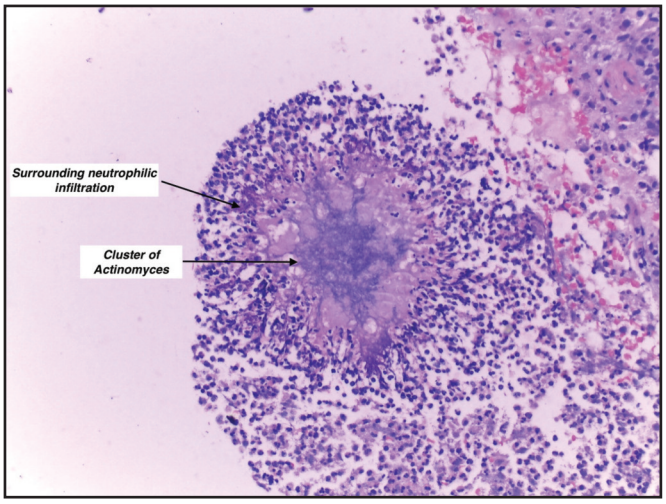

Fig. 2: Histopathological examination showed cluster of Actinomyces with surrounding neutrophilic infiltration.

predilection for causing pulmonary actinomycosis with dissemination to other organs has also been observed.[2]

The typical presenting features are prolonged cough, pleuritic chest pain, hemoptysis, and weight loss.[2] The differential diagnosis of these conditions are broad and include conditions such as tuberculosis and lung malignancy. Besides chest radiography, CT imaging is useful in evaluating the exact location and extends of the disease, and thus, helps in directing accurate biopsy and monitors the response. The ability to invade surrounding structures in actinomycosis leads to its confusion with bronchogenic carcinoma.[4] These features were present in our patient and further imaging studies were initially suggestive of lung malignancy. However, CT-guided biopsy was consistent with pulmonary actinomycosis, and therefore, excluded the possibility of bronchogenic carcinoma.

Antibiotic treatment with penicillin is associated with excellent clinical outcome.[5] It consists of intravenous penicillin for two to four weeks followed by a prolonged period of six to twelve months of oral penicillin.[5] Response to treatment should be monitored radiologically with chest radiography or CT scan. In the presence of treatment failure, bronchogenic carcinoma should be suspected and further investigations should be carried out. As for our patient, he had marked response to the antibiotic therapy with complete resolution on chest radiography during follow-up.

In summary, actinomycosis should be considered as one of the differential diagnosis in the presence of intrathoracic mass. Obtaining tissue biopsy will help to confirm the diagnosis and rule out other important differential diagnoses, including bronchogenic carcinoma. This will ensure early treatment and improve overall prognosis.

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