

An Unusual Cause of a Pulmonary Mass: Actinomycosis

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Abstract

We present the case of a 62-year-old male with chronic obstructive pulmonary disease and poorly controlled diabetes mellitus who presented with haemoptysis. A radiograph of the chest showed a right lower parahilar opacity which on the contrast enhanced computed tomography was seen to be an irregular, spiculated mass localised to the middle lobe. Considering malignancy as the most probable diagnosis, a bronchoscopic endobronchial biopsy was performed which surprisingly established pulmonary actinomycosis as the diagnosis. The patient was successfully managed with amoxicillin and clavulanic acid and glycaemic control. [Indian J Chest Dis Allied Sci 2015;57:177-179]

Key words: Actinomycosis, *Actinomyces* spp, *Nocardia* spp, Pulmonary mass, Malignancy.

Introduction

Thoracic actinomycosis is a fairly common disease entity in the developing world and tends to occur on the background of immunosuppressive conditions. However, of the many forms of thoracic actinomycosis, pulmonary affliction in the form of a lung mass is rather uncommon. Irregular, spiculated parahilar opacity on the computed tomography of the thorax generally points toward the diagnosis of malignancy. Despite clues suggestive of the disease, mis-diagnosis as lung carcinoma, tuberculosis and lung abscess is common.¹ Thus, the diagnosis of pulmonary actinomycosis requires a high index of suspicion. Previously, cases of pulmonary actinomycosis have been reported from India with signs and symptoms suggestive of tuberculosis or bronchogenic carcinoma.²⁻⁴

We report a case of an elderly male who presented with this picture consistent with malignancy but later diagnosed on bronchoscopic endobronchial biopsy as pulmonary actinomycosis. Considering its rarity of occurrence and similarity of presentation of this condition with other common respiratory disorders, this case is being reported.

Case Report

A 62-year-old male, retired coal-miner, ex-smoker presented to our Institute with progressive exertional dyspnoea and productive cough that had been present for the last 8 years. He had been diagnosed to have chronic obstructive pulmonary disease (COPD) and was receiving inhaled steroids and bronchodilators. However, he had started noticing haemoptysis for the last one month. He denied any history of fever, chest pain or loss of weight and appetite. Also, he was a diabetic since five years which was poorly-controlled

despite regular treatment. Physical examination was unremarkable except for a dull note on percussion in the right infra-mammary region and prolonged expiration on auscultation. Blood counts, kidney and liver function tests and urine analysis were within normal limits. Serological testing for human immunodeficiency virus was negative. The chest radiograph demonstrated irregular, well-defined parahilar opacity in the right lower zone, Silhouetting the right heart border, and thus, raising the suspicion of a malignancy (Figure 1A). A high resolution contrast enhanced computed tomography of the thorax in the axial plane showed irregular, spiculated mass in the right middle lobe compressing the bronchus intermedius (Figure 1B). The diagnosis of a pulmonary neoplasm was strongly considered at this stage and a bronchoscopic evaluation was planned.

Bronchoscopy demonstrated the right middle lobe bronchus to be partially obstructed by a white fungating mass with blood oozing from it. *Pseudomonas aeruginosa* was cultured from the bronchial aspirate which was negative for acid-fast bacilli, fungi and malignant cells. Although atypical cells or granuloma were not seen, the histopathological examination of the endobronchial biopsy from the mass surprisingly showed numerous bacterial colonies within a neutrophilic background. Also a Gram stain of the endobronchial biopsy (Figure 2) revealed filamentous, branching Gram-positive organisms within a neutrophilic inflammatory background. The diagnosis was now revised to be an infection due to a filamentous organism. To differentiate between *Actinomyces* spp and *Nocardia* spp, a modified Ziehl-Neelsen stain (1% H₂SO₄) was done which came out to be negative that ruled-out nocardial infection. However, a culture of the same could not be performed.

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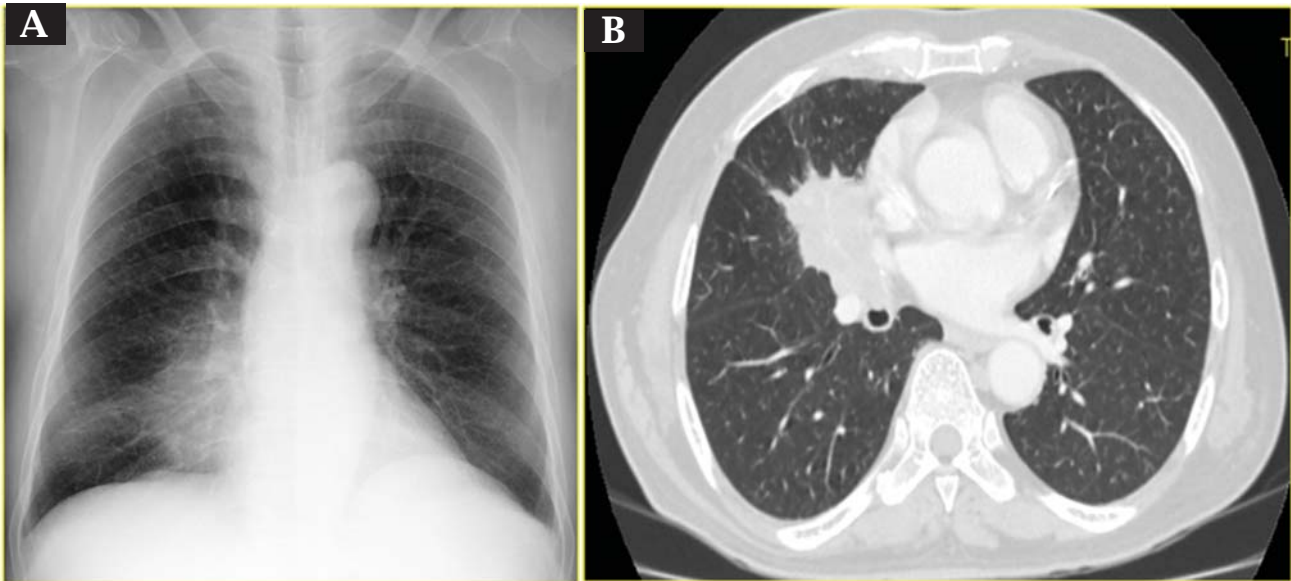


Figure 1. (A) Chest radiograph (postero-anterior view) showing an irregular, parahilar opacity in the right lower zone, Silhouetting the right heart border; (B) high resolution computed tomography of chest of the same patient showing an irregular, spiculated mass in the right middle lobe compressing the bronchus intermedius.

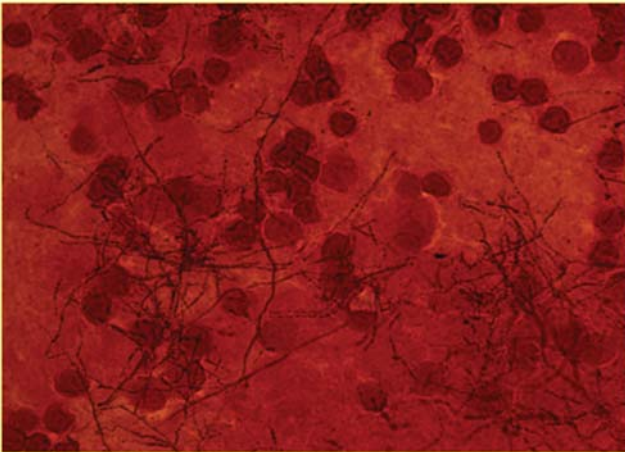


Figure 2. Gram's stain of the endobronchial biopsy specimen. Photomicrograph showing thin, filamentous, branching Gram-positive organisms with a neutrophil-rich background (Gram's stain x20).

The patient was diagnosed to have COPD with pulmonary actinomycosis and was treated with an intravenous amoxicillin-clavulanic acid, 1.2 g three times a day for two weeks followed by oral therapy for six months. Follow-up radiograph at three months (Figure 3) showed resolution of the right lower parahilar opacity.

Discussion

The *Actinomyces* spp, are Gram-positive anaerobic bacteria that normally colonise human organs, such as oropharynx, gastrointestinal tract and female genitalia.⁵ *A. israeli* is the most common agent that causes human diseases.⁶ Most cases of pulmonary actinomycosis are related to poor oral hygiene, aspiration of gastrointestinal fluid and

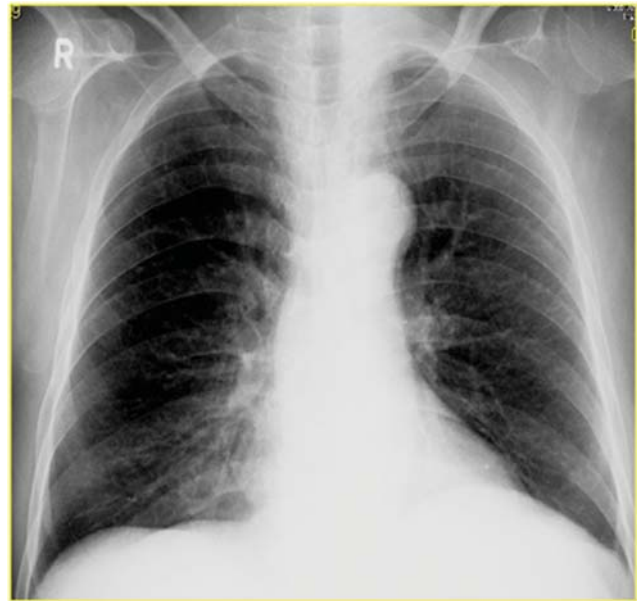


Figure 3. Chest radiograph (postero-anterior view) showing resolution of the opacity on the right side after three months of therapy with amoxicillin-clavulanic acid.

immuocompromised status.⁷ Established risk factors for pulmonary actinomycosis include smoking in 61%, alcohol addiction in 14%, COPD in 20% and poor dental hygiene in 31% patients.⁸ Most cases of actinomycosis are associated with a mixed flora comprising particularly of organisms like *Pseudomonas* spp which was also the scenario in our report.⁹ Actinomycosis is characterised by the ability to penetrate tissue planes, resulting in fistula or abscess formation. Up to 25% of cases with thoracic actinomycosis are initially mis-diagnosed as malignancy or tuberculosis given the similar

radiological picture.^{1,8} The chest radiograph findings may range from small nodular lesion to mass or consolidation.¹⁰ The radiological findings in the present case was consistent with malignancy.

The diagnosis of pulmonary actinomycosis is particularly challenging as this organism being an obligate anaerobe needs to be carefully processed from clinical specimens.¹¹ In the present case, a culture could not be performed given the unavailability of anaerobic methods of sample processing and culture. Although appearance of radially arranged sulphur granules from discharging sinuses is the pathological hallmark of this disease, the presence of these granules is neither sensitive nor specific.¹² Invasive investigations (e.g., bronchoscopy with transbronchial biopsy) are necessary to obtain samples for histopathological and microbiological identification.¹³ The diagnosis in the present report was established by endobronchial biopsy; Gram staining and modified Ziehl-Neelsen staining was done to exclude nocardiosis.

Pulmonary actinomycosis has an excellent prognosis with adequate antibiotic treatment.⁸ Antibiotic treatment duration should be individualised, and termination of treatment can be considered one or two months after complete clinical and radiological disease resolution in most patients.¹⁴ Diminution in the shadowing on a chest radiograph is expected within four weeks.¹ Many recent studies have reported that traditional long-term regimen is not necessary and short-term treatment is successful.¹⁵ A high level of clinical suspicion is required to differentiate pulmonary actinomycosis from malignancy.

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