Case Report

Hemoptysis secondary to actinomycosis: A rare presentation

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ABSTRACT

We present a 70-year-old female patient who had the history of hypertension and presented with massive haemoptysis. She had been complaining of cough with expectoration and mild streaking of blood in sputum for about 3 days with only crepts in right infrascapular and infra-axillary regions as positive clinical findings. Bronchoscopy revealed a cauliflower-like lesion in the upper- right lobe bronchus; bronchial aspirate showed occasional colonies of gram positive filamentous bacteria surrounded by neutrophils. The Trucut biopsy showed sheets of neutrophils with colonies of filamentous bacteria consistent with actinomycotic infection. She was started on intravenous benzyl penicillin 20 million units 6 hourly. She recovered with no further bouts of hemoptysis and was discharged on amoxicillin + clavulanic acid in a stable condition and she remained under similar condition for more than a year on follow up. Actinomycosis is a rare disease caused by a harmless commensal species, *Actinomyces.* Diagnosis of actinomycosis is a challenging situation, and more so, very few cases causing hemoptysis have come to light so far.

KEY WORDS: Actinomycosis, Hemoptysis, Bronchoscopy

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INTRODUCTION

Actinomycosis is a subacute, indolent form of chronic bacterial infection characterized by contiguous tissue spread, suppurative and granulomatous inflammation, and formation of multiple abscesses and sinuses discharging sulphur granules.[1] Cervico-facial actinomycosis is the commonest form comprising 50% to 60% of cases[2] followed by abdomio-pelvic in 20%[3] and thoracic actinomycos is in 15% cases.[4] Actinomycosis of the eyes, skin, heart, and disseminated forms are pretty rare.[5] We are reporting a case of pulmonary actinomycosis mimicking lung cancer that presented with haemoptysis, had initial radiological deterioration but finally responded to appropriate antibiotics.

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CASE REPORT

A 70-year-old female patient presented to us in the early morning of January 1, 2011 with massive haemoptysis. The patient was a known case of hypothyroidism and hypertension and on regular treatment. She had been complaining of cough with expectoration and mild streaking of blood in sputum for about 3 days. On examination the pulse rate was 96/min, BP 134/76 mm Hg, RR 25/min, and SPO_2 94% on 2 l of O_2. Chest examination revealed bilateral vesicular breath sounds with crepts in right infrascapular and infra-axillary regions. There was no history of dental manipulation, facial lesions or trauma to mouth, aspiration, or alcoholism. Her cardiovascular, GIT, and central nervous system examinations revealed no abnormality. She was admitted in the intensive care unit and her initial investigations including ECG, ABG, CBC, KFT, LFT, and RBS were within the normal range. Her sputum was sent for AFB, gram's stain, and fungal stain along with culture and sensitivity for pyogenic organisms. Her chest X-ray revealed right mid zone homogenous opacity along with the obliteration of both right costophrenic and cardiophrenic angles [Figure 1]. She was started on piperacillin + tazobactum along with IV haemostatics, IV fluids, and cough suppressants. Once stabilized, she was taken for diagnostic fibreoptic

bronchoscopy that revealed a cauliflower-like growth in RUL bronchus [Figure 2] raising a high suspicion of malignancy. BAL was taken and bronchial biopsy for histopathology was obtained from the lesion and sent for histopathological examination. She was continued on conservative treatment and the haemoptysis stopped. BAL was negative for AFB; no organisms were seen on gram's stain and fungal stain. Pyogenic culture also did not grow any organisms. Her chest X-ray after the antibiotics showed an increase in the size of the homogenous opacity abutting the heart [Figure 3]. CECT thorax revealed a large heterogenous soft tissue mass measuring 7 × 5.9 × 6 cm with surrounding parenchymal infiltrates in anterior segment of upper-right lobe and medial segment of middle-right lobe. The mass was abutting the anterior segmental bronchus of upper-right lobe, medial segmental bronchus of the middle-right lobe, costal and mediastinal pleura; the patchy area of consolidation was seen in lower-right lobe limited by oblique fissure with bilateral pleural effusions, which were more on the right side [Figure 4]. Diagnostic pleural aspiration was done. Pleural fluid did not show any organisms on gram stain, AFB stain, and fungal stain. Pyogenic culture was sterile and malignant cells were not seen. The ADA level was 4.76 IU, thus almost ruling out TB. Bronchial biopsy showed markedly inflamed bronchial mucosa with granulation tissue and sheets of inflammatory cells, predominantly neutrophils. Bronchial biopsy was also sent for culture where occasional colonies of gram positive filamentous bacteria surrounded by neutrophils were seen. CT-guided FNAC and Trucut biopsy were done for better understanding of the lesion. On performing FNAC thick pus was aspirated out. FNAC showed sheets of neutrophils and occasional branches of filamentous bacteria with impression of suppurative pathology. Trucut biopsy showed sheets of neutrophils with colonies of filamentous bacteria and sulphur granules [Figure 5] consistent with actinomycotic infection. She was started on Benzyl penicillin 20 lac units IV 6 hourly and had a dramatic response. Her symptoms disappeared and chest X-ray almost cleared [Figure 6]. Finally, she was discharged in a stable condition on oral amoxicillin + clavulanic acid combination. She is under regular follow up and has continued to be in a stable condition for more than a year.

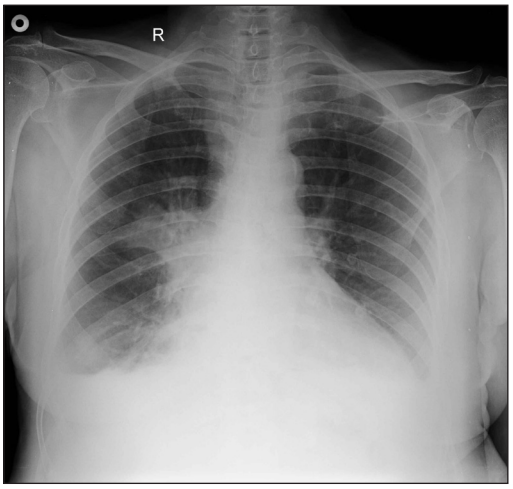

Figure 1: Initial chest X-ray showing pneumonia with pleural reaction

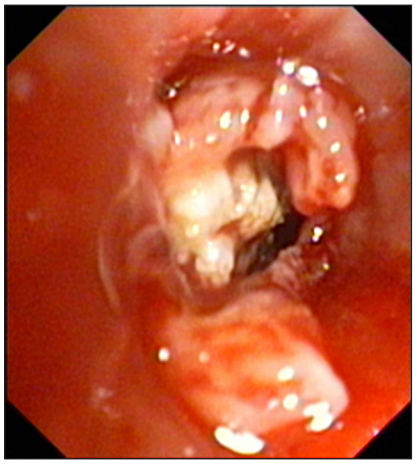

Figure 2: Bronchoscopic view showing cauliflower-like growth in RUL bronchus

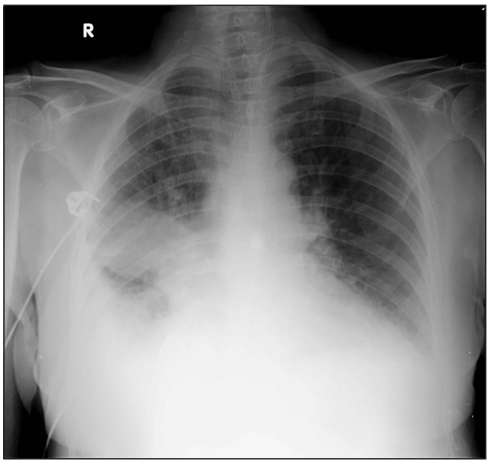

Figure 3: Chest X-ray showing deterioration and increase in opacity

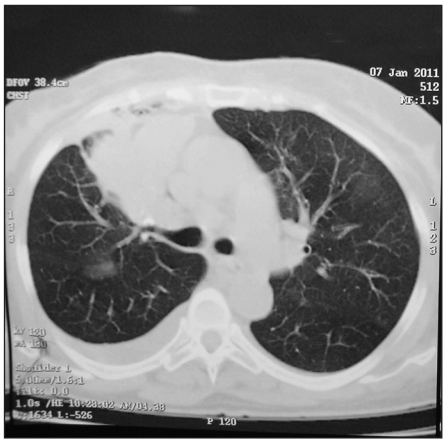

Figure 4: CT chest

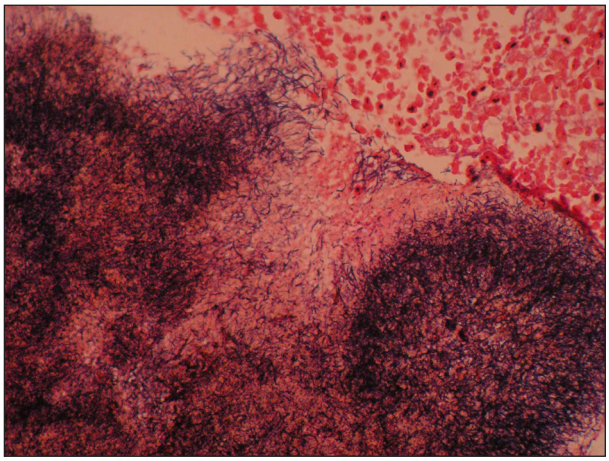

Figure 5: Lung biopsy showing sheets of neutrophils with abundant filamentous bacteria

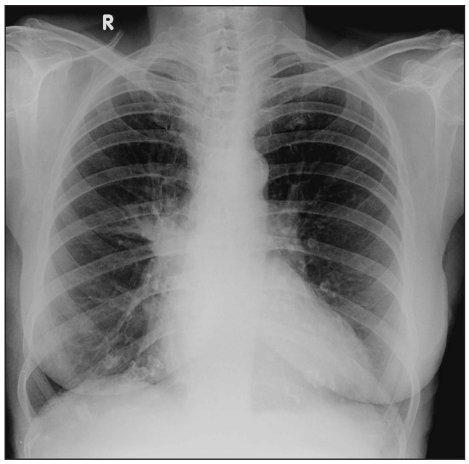

Figure 6: Chest X-ray on discharge

DISCUSSION

Actinomycosis was once a common and fatal disease.[4] It is characterized by slow invasion of body tissue and incidence has decreased because of advent of antimicrobial agents and better oral hygiene. In 1877, Bollinger reported 'lumpy jaw' in cattle discharging yellow granules and named the causative agent as *Actinomyces bovis*.[6] In 1878, Israel identified the major human pathogen, *Actinomyces israelii* in two patients.[7] It is a nonmotile, nonspore forming, nonacid fast, gram positive, and anaerobic to microaerophilic filamentous bacterial rod.[1]

The commonest age group is young to middle age and there is no racial predilection. Men are more affected than women (3:1) except for pelvic actinomycosis. Our patient was an elderly male and suffering from thoracic actinomycosis.

Actinomycosis is the most misdiagnosed disease, and it is said that no other disease is so often missed by expert clinicians as actinomycosis. Thoracic actinomycosis is usually mistaken for a neoplasm or for pneumonia due to more usual causes.[8] In our patient as well, the initial bronchoscopic picture of cauliflower-like growth made us think for malignancy.

Three clinical presentations should prompt the attention to this disease: (1) development of a spontaneously resolving and recurring sinus tract, (2) a relapsing or refractory infection after a short course of therapy, and (3) combination of progression across tissue boundaries, chronicity, and mass-like features, which may mimic malignancy.[8] Our patient had radiological deterioration after initial treatment; the chest X-ray after the antibiotics had showed an increase in the size of the opacity and bronchoscopic view was equally suspicious for the neoplasia.

These days, actinomycosis in itself is very uncommon, and haemoptysis as a presenting symptom is still rarer. In a 1,100-bed teaching hospital at Nottingham City, UK, pulmonary actinomycosis was diagnosed histologically in only four cases over a 15-year period.[5] The patient who presented to us had haemoptysis with no history of cervicofacial involvement or history of dental manipulation or trauma to mouth, aspiration, or alcoholism. The diagnosis of actinomycosis is always a challenge, in one series by Weese and Smith;[9] the diagnosis was suspected on admission in <7% of patients who later turned out to have the infection.

Routine isolation of actinomyces spp. is not diagnostic of the infection, they should be isolated in pure form from the body fluids, like BAL. Actinomyces spp. are commensals of the mucosa-lined orifices like human oropharnynx, female genitalia, and gastrointestinal tract, and are often routinely cultured from there.[5]

Our main differential diagnosis was between pneumonia and lung cancer, but the biopsy report, presence of sulphur granules, culture report demonstrating colonies of gram positive filamentous bacteria, and excellent clinical and radiological response to IV penicillin put the query to rest.

Penicillins, tetracyclines, and macrolide antibiotics are highly efficacious against actinomycosis; imipenem, ceftriaxone, and piperacillin-tazobactam are moderately effective but cephalexin, metronidazole, and aminoglycosides are not effective[5,8] and should not be used. Actinomycosis requires protracted antibiotic therapy for nearly 1 year, with the initial phase of high-dose (18–24 million units 6 hourly) intravenous penicillin for 2–6 weeks, followed by oral penicillin or amoxycillin for a total of 1 year. Inadequate antibiotic therapy may result in complications such as broncho-pleural fistulas and empyema.[5] Our patient was treated with IV penicillin and was discharged in a stable condition on amoxycillin with clavulanic acid. If the infection is recognized early and proper treatment is given, actinomycosis has an excellent prognosis with a very low mortality.[9,10]

The case is being reported because of following reasons:

i. Now-a-days, actinomycosis is very uncommon;
ii. Bronchoscopically, it mimicked lung cancer but was ruled out on histo-pathological examination;
iii. Patient had initial radiological deterioration but finally responded to appropriate antibiotics.

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