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CASE REPORT OPEN ACCESS

A rare case report of pulmonary nocardiosis mimicking as lung malignancy

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Abstract

Pulmonary nocardiosis is a rare infectious disorder mainly affecting immunocompromised patients. It may remain cryptic which gradually progresses in its course. Our patient was a 37 years old immunocompetent female who presented with radiological picture of left upper lobe opacification. She was treated with empirical anti tuberculosis treatment outside, no radiological improvement seen. After she reported here, she was evaluated with bronchoscopy with biopsy and bronchial wash culture showed *Nocardia* species. She was managed with trimethoprim-sulphamethoxazole and amikacin with regular follow up for 6 months. She had radiological resolution and clinical improvement after 4 months of treatment. Hence we made the diagnosis of this rare infection in immunocompetent individual and successfully treated her, which was mistreated as pulmonary tuberculosis elsewhere.

Keywords: pulmonary nocardiosis; immunocompetent; modified acid fast stain; trimethoprim-sulpamethoxazole; *Nocardia* species

Introduction

Pulmonary nocardiosis is caused by *Nocardia* species, which are gram positive aerobic bacteria belonging to actinomycetes group. There are almost 100 species of genus *Nocardia*. Most human infections are due to Nocardia asteroids complex. Pulmonary nocardiosis is common due to inhalational route of transmission. They can also cause cutaneous, central nervous system (CNS), ocular, skeletal or disseminated infection. They usually affects immunocompromised individual.

Pulmonary nocardiosis is a rising bacterial infection, with a high chance of misdiagnosis. Pulmonary nocardiosis is a major cause of morbidity and mortality in immunocompromised patients. Lack of suspicion, non-specific clinic-radiological presentation (often mimicking tuberculosis and fungal infections), diagnostic intricacies, and lack of systematic reporting are the probable reasons that have hindered the true estimation of its incidence, worldwide. Pulmonary nocardiosis and disseminated forms of the infection are opportunistic diseases occurring mainly in patients deficient in T cell-mediated immunity.

We report here a case of pulmonary nocardiosis in an immunocompetent individual which is quite rare.

Case Report

35 years-old female with no known co morbidities presented to outpatient Department of Respiratory Medicine, Velammal Medical College & RI, Madurai with symptoms of productive cough, shortness of breath and chest pain for the past 3 months. Patient was started on empirical ATT (RHEZ) outside 3 months ago for the above mentioned complaints, based on chest skiagram.

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On examination, there was reduced intensity of breath sounds in left mammary, interscapular region with no added sounds. Lab investigations revealed leucocytosis with microcytic hypochromic anemia. Chest X ray showed heterogenous opacity left upper lobe (Figure 1). Computed tomography (CT) of Thorax done showed Consolidation with air broncogram in left upper lobe posterior segment with heterogenous enhancement (Figure 2). CT brain and ultrasound abdomen done were normal study. Bronchoscopy was done which showed Mucoid secretions in left upper lobe from which Bronchial wash taken (Figure 3). Transbronchial lung biopsy was taken from left upper lobe posterior segments. Bronchial wash analysis showed Filamentous Acid fast bacilli in modified AFB stain (1 % H_2SO_4) and culture grew *Nocardia* species (Figure 4).

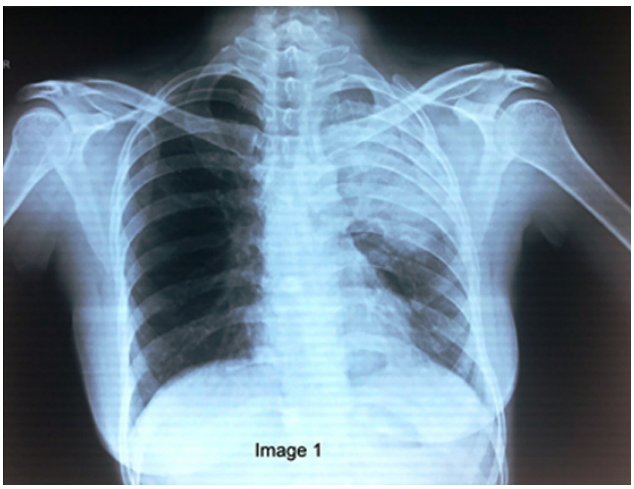

Figure 1: Chest X ray showed heterogenous opacity left upper lobe.

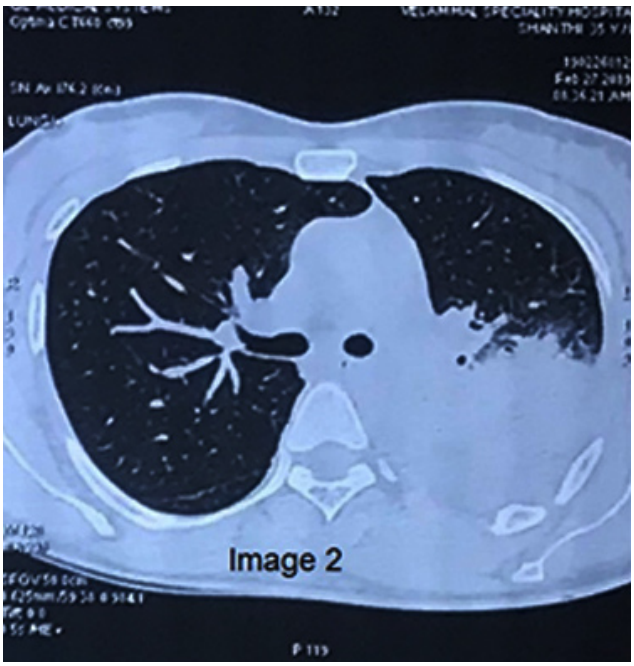

Figure 2: Computed tomography of thorax done showed consolidation with air broncogram in left upper lobe posterior segment with heterogenous enhancement.

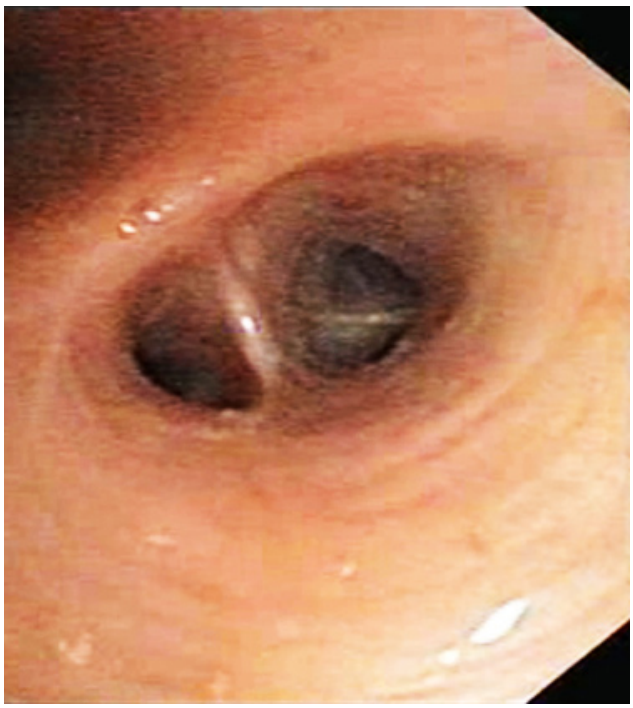

Figure 3: Bronchoscopy showed mucoid secretions in left upper lobe from which bronchial wash taken.

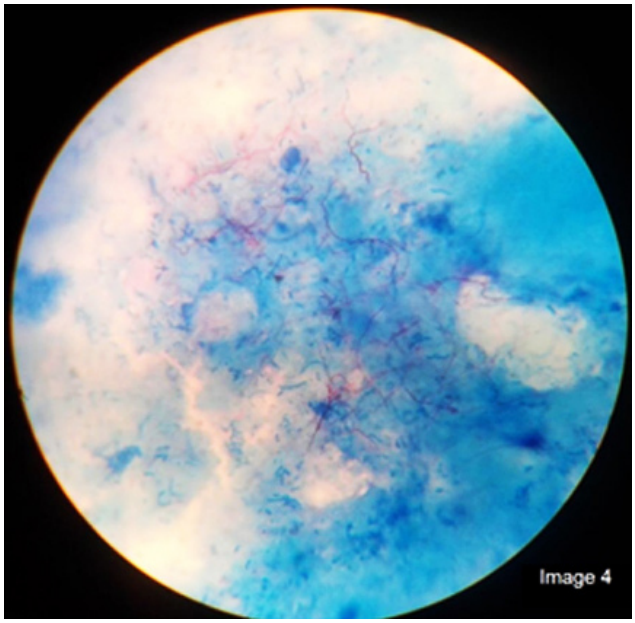

Figure 4: Modified AFB Stain (1% H2SO4)- Bronchial wash analysis showed filamentous acid fast bacilli in

Bronchial wash AFB and cytology were negative. Histopathological examination revealed chronic suppurative inflammation with presence of organisms morphologically suggestive of Nocardia (Figure 5). Patient was initiated on trimethoprim-sulphamethoxazole double strength twice daily and inj. Amikacin 15 mg/kg once daily. Renal and liver parameters were monitored weekly for 3 months and were within normal limits. Chest X ray after 4 months of treatment showed clearance of left upper lobe lesion with symptomatic improvement (Figure 6).

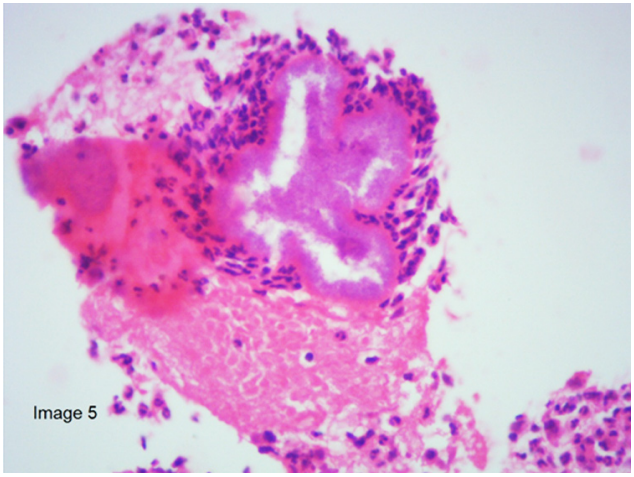

Figure 5: Histopathological examination revealed chronic suppurative inflammation with presence of organisms morphologically suggestive of Nocardia.

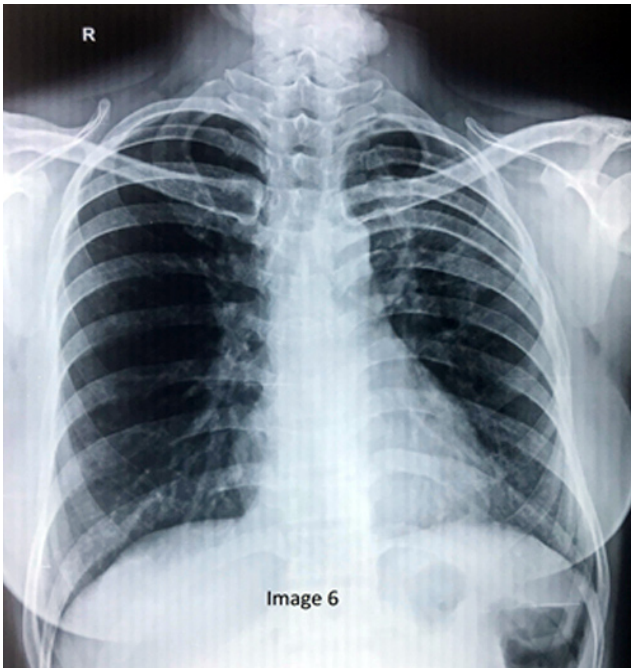

Figure 6: Chest Xray after 4 months of treatment showed clearance of left upper lobe lesion.

Discussion

Nocardia asteroids complex usually affects middle aged males [1]. Pulmonary nocardiosis presents as an acute, subacute, or chronic disease in patients with and without predisposing chronic conditions. Predisposing factors include patients with malignancies, human immunodeficiency virus infection and solid-organ or hematopoietic stem cell transplant and those on steroids or other immunosuppressive medications [2, 3]**.** The genus Nocardia are branching gram-positive, variably acid-fast, aerobic bacteria and they can fragment into rod-shaped or coccoid elements [4]. A modified Ziehl-Neelsen technique (1% sulphuric acid) is used to demonstrate Nocardia [5].

Most common symptoms in pulmonary nocardiosis include fever, weight loss, dry cough, anorexia, night sweats, dyspnea and hemoptysis. Acute presentation can be in the form of pneumonia, abscess formation, bronchopneumonia, pleural involvement and empyema. Involvement in preexisting lung cavities can produce "fungus ball" appearance in chest skiagram. Skin manifestations include superficial abscess, cellulitis, pustules, pyoderma and ulcerations. CNS involvement include cerebral nocardiosis and meningitis. Other systemic involvement includes peritonitis, epididymo-orchitis, iliopsoas, ischiorectal and perirectal abscess, endophthalmitis, retinitis, pericarditis, endocarditis, aortitis, septic arthritis and bursitis, osteomyelitis, and diffuse organ abscesses. Our patient had only pulmonary involvement in the form of left upper lobe consolidation.

Diagnosis is established by analyzing respiratory secretion and aspirate from abscess to be subjected to Modified Acid fast stain, grocott staining for demonstrating bacteria. Culture is the gold standard method of diagnosis and the culture should be observed for 2 weeks before discarding [6]. Bronchoscopy was done for our patient and bronchial wash showed Nocardia in modified Ziehl-Neelsen staining and culture grew *Nocardia* species.

Management of nocardial infection includes antibiotic therapy and surgery. Medical management includes Trimethoprim-sulfamethoxazole as monotherapy in mild localized infections. In case of severe pulmonary infection, CNS involvement, or disseminated infection 2 agents (such as trimethoprim-sulpamethoxazole or imepenem plus amikacin) should be used.In case of life threatening disease, 3 drugs should be considered [7]. Our patient was managed with dual antibiotic therapy. Immunocompetent patients with pulmonary or systemic nocardiosis, without CNS involvement should be treated for a minimum of 6-12 months extending to 12 months in those with CNS infection. Other agents used in nocardiosis include amikacin, imipenem, meropenem, ceftriaxone, cefotaxime, minocycline, moxifloxacin, levofloxacin, linezolid, tigecycline, and amoxicillin -clavulanic acid [8, 9].

Conclusion

Even Immunocompetent patients with atypical clinical and radiological features needs to be evaluated for *Nocardia* species as the virulence is high with multisystem involvement and increased mortality and morbidity.

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