

CASE REPORT

UNUSUAL PRESENTATION OF PULMONARY NOCARDIOSIS

Dhanasekar T¹, Gomathi R. G², Sindhura Koganti³, Rajagopalan B⁴

HOW TO CITE THIS ARTICLE:

Dhanasekar T, Gomathi R. G, Sindhura Koganti, Rajagopalan B. "Unusual Presentation of Pulmonary Nocardiosis". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 24, March 23; Page: 4215-4220, DOI: 10.14260/jemds/2015/607

ABSTRACT: Nocardiosis is an infrequent but potentially serious pulmonary infection caused by a soil borne filamentous bacteria. Presentation of nocardiosis infection is quite variable.^[1] A 67 year old man, non-smoker presented with clinical symptoms of Nonproductive cough and fever of 10 days duration. Chest x-ray showed a right upper lobe dense homogenous opacification and computed tomography demonstrated a Right upper lobe mass lesion with speculated margins suspicious of malignancy. The patient was admitted with diagnosis of suspected primary lung malignancy with a post destructive pneumonic infection as the total counts are elevated to 21, 400. Intravenous antibiotic piperacillin / tazobactem was started. Computed tomography guided needle biopsy showed no evidence of malignancy suggestive of chronic inflammation. Bronchoalveolar lavage from Right Upper lobe revealed filamentous, gram positive, weakly acid fast positive bacteria consistent with Nocardia species which is confirmed by bacterial culture. Treatment with trimethoprim / Sulfamethoxazole resulted in complete resolution of radiological and clinical symptoms. Our report emphasizes that a high level of clinical suspicion is required in patients without risk factors. Furthermore our case emphasizes that pulmonary nocardiosis is usually suppurative in nature, rarely a granulomatous Response may occur.

INTRODUCTION: Pulmonary nocardiosis is an infrequent but severe infection difficult to be diagnosed and mistaken for other lung diseases that commonly presents as a subacute or chronic suppurative disease, mimicking a lung carcinoma, abscess or pulmonary tuberculosis.^[2] Nocardia spp. are aerobic, gram positive bacteria belonging to Actinomycetes and are responsible for localized or disseminated infection in animals or humans.^[3] In humans, N. asteroides complex is the predominant pathogen. Pulmonary infection is usually caused by N. asteroides (85%), whereas N. brasiliensis causes cutaneous and subcutaneous abscess.^[4] Nocardia most often enters through the respiratory tract and produces infection in both immunocompromised and immunocompetent hosts. Common predisposing factors for nocardial infection include corticosteroid therapy, chemotherapy for neoplasm, and acquired immune deficiency syndrome (AIDS). These organisms are found worldwide in soil, decaying vegetable matter and water, although they have the propensity to become airborne, particularly in dust particles.^[2] Inhalation of the organism is considered the most common route of entry.

CASE REPORT: A 67 year old male, non-smoker, was admitted to the hospital with a history of Nonproductive cough, fever for 10 days duration. He was apparently normal 10 days back. There was no evidence of immune compromised status. On examination he appeared pale and emaciated, but not cyanotic. His vital signs included a blood pressure of 120/70, heart rate of 84 bpm, and respiratory rate of 20 breaths/min. chest auscultation revealed decreased breath sounds in right infraclavicular area. Cardiac auscultation showed no abnormality. And the remainder of physical

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examination normal. Laboratory evaluation revealed Total counts: 21, 400. Other routine blood investigation normal.

Fig. 1: Chest radiograph showed homogenous opacity in right upper zone suggestive of mass.

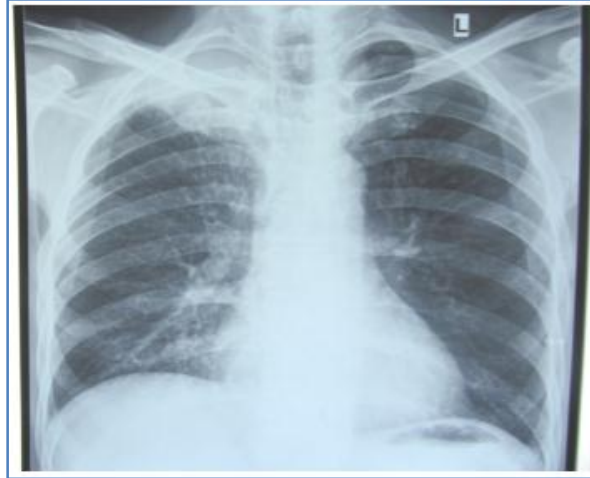


Fig. 1

Fig. 2 and 3: CT thorax plain and contrast revealed right upper lobe mass with speculated margins suspicious of malignancy.

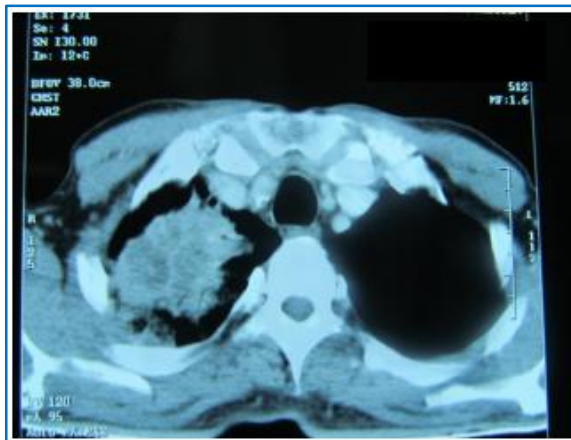


Fig. 2

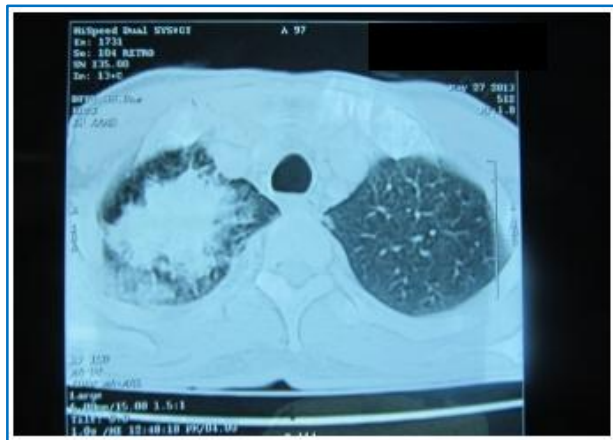


Fig. 3

CT Guided biopsy was done and histopathological examination showed no evidence of malignancy suggestive of chronic inflammation. Sputum samples were collected and tested for the presence of acid fast bacilli [Fig. 6], but all smears were negative. The patient then underwent bronchoscopy with bronchoalveolar lavage (BAL). BAL fluid bacterial culture [Fig. 4] revealed the presence of filamentous gram positive structures compatible with *Nocardia* species.

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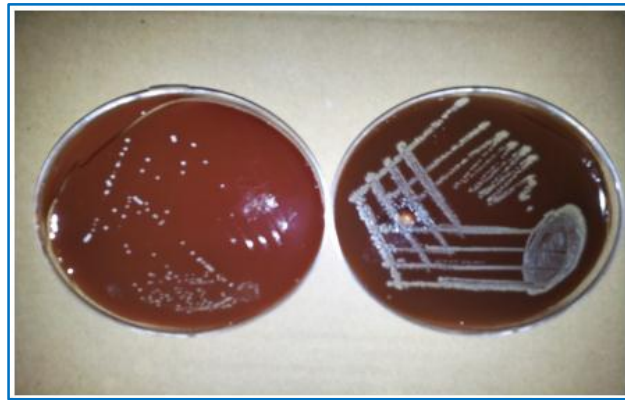


Fig. 4: BRONCHIAL WASH CULTURE

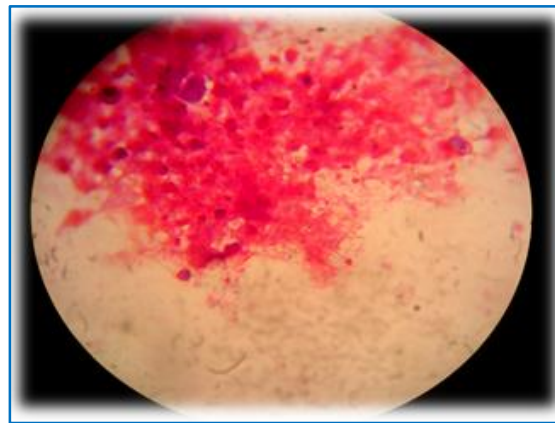


Fig. 5: GRAM STAINING OF BAL FLUID

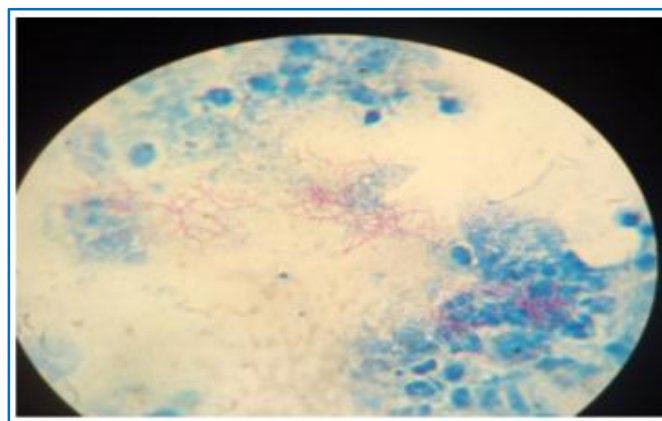


Fig. 6: ACID FAST BACILLI STAINING

The patient was started on trimethoprim –sulfamethoxazole, after 6 months of treatment the patient showed a complete regression of symptoms and radiological findings [Fig. 1 and 7].

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COMPARISON: BEFORE TREATMENT AFTER TREATMENT

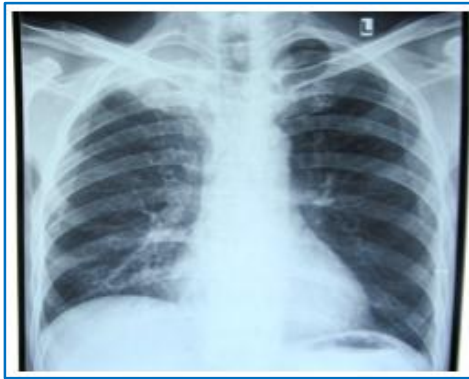


Fig. 1

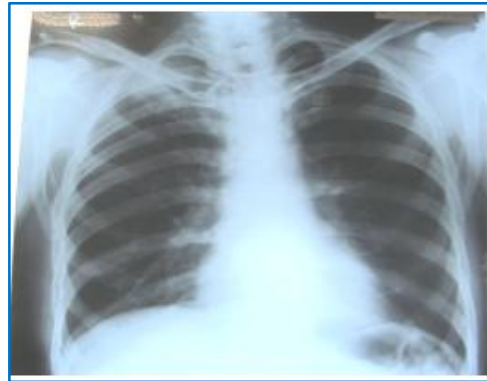


Fig. 7

FOLLOW UP: Patient completed 6 months of treatment showed good improvement. Chest x-ray after 6 months of treatment Fig. 8.

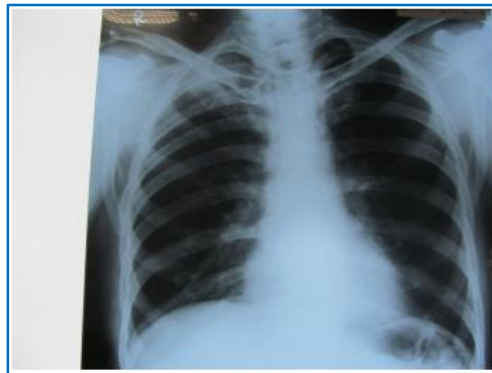


Fig. 8

Fig. 9 & 10: CT SCAN AFTER 6 MONTHS OF TREATMENT.

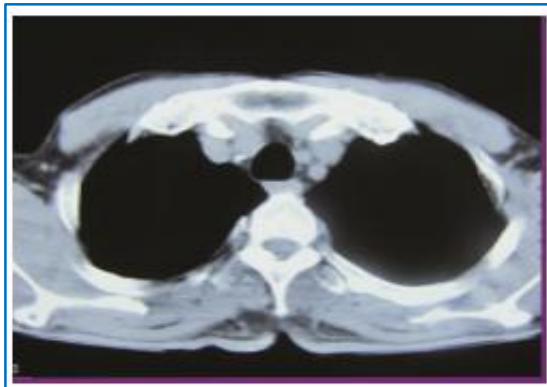


Fig. 9



Fig. 10

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DISCUSSION: Nocardiosis is a well-recognized opportunistic pathogen in immunocompromised individuals and also seen in immunocompetent patients with high risk being those on corticosteroids, chemotherapeutic agents, diabetes mellitus and malignancy. Chronic lung disease and alcoholism are additional risk factors for pulmonary nocardiosis. Nocardia is a rod shaped fungus like bacteria resembles actinomyces weakly acid fast, gram positive, catalase positive. Seven species of nocardia have been associated with human disease. *N. asteroides* is responsible for about 70% of infection caused by these organisms,^[5] and debilitated patients have a 45% mortality rate even with appropriate therapy. Mortality is increased in disseminated disease involving 2 or more organs. There is no age or race predilection. Inoculation occurs via inhalation, with over 90% of cases primarily resulting in pulmonary nocardiosis. The patients may present with cough, fever, and breathing difficulties.^[6]

The radiographic appearance of pulmonary nocardiosis is varied and nonspecific. The most commonly described findings include localized consolidation, cavitations, and lobar infiltrative disease with characteristically thick-walled cavities. Computed tomography findings include consolidation with or without cavitation, multiple discrete pulmonary nodules, pleural effusion, and chest wall extension. Notably, AIDS patients diagnosed with pulmonary nocardiosis were found to have more irregular, spiculated nodules, and a higher incidence of cavitory masses.^[7] The diverse radiological manifestations of pulmonary nocardiosis reflect its ability to cause both suppurative and granulomatous infection.^[6]

HIV-related nocardiosis usually appears in patients with advanced immunosuppression. Previous studies have reported that between 57% and 68% of patients have AIDS-defining criteria at the time of diagnosis of nocardial infection, and that the CD4+ count is less than 200 cells/ μ L in 88-100% of these patients.^[8]

Since the clinical and radiologic manifestations are non-specific, and the microbiological diagnosis is often difficult, it seems likely that, in some patients, pulmonary nocardiosis will be mistaken for other infections, such as tuberculosis or bacterial pneumonia.^[8]

The diagnosis of nocardiosis often is not considered in a patient with significant pulmonary infection, because the incidence of Nocardia is relatively low compared with that of many other organisms. Moreover, Nocardia is difficult to culture, and there is no reliable serologic test to detect its presence. Its marked radiographic pleomorphism also tends to exclude it from differential diagnosis of chest film abnormalities, since there are no characteristic findings that bring it to mind.^[9] For this reason, nocardiosis should be considered in the differential diagnosis of any chronic pneumonia not responding to the antibiotic treatment.^[10]

CONCLUSION: Pulmonary infection by this pathogen may thus be difficult to diagnose based on clinical and radiological features as these are not specific: Nocardiosis should always be considered in the differential diagnosis of indolent pulmonary disease even in immunocompetent patients. Our case illustrates the need for a high index of suspicion of pulmonary nocardiosis. Although pulmonary nocardiosis is usually suppurative in nature, an unusual granulomatous response may occur.

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AUTHORS:

1. Dhanasekar T.
2. Gomathi R. G.
3. Sindhura Koganti
4. Rajagopalan B.

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Chest & TB, Sri Ramachandra University.
2. Post Graduate, Department of Chest & TB, Sri Ramachandra University.
3. Assistant Professor, Department of Chest & TB, Sri Ramachandra University.

FINANCIAL OR OTHER

COMPETING INTERESTS: None

4. Professor, Department of Chest & TB, Sri Ramachandra University.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Gomathi R. G,
Flat No. 302, Tower 24, Phase 2,
Skycity Appartments, Vanagaram,
Chennai-600095, Tamil Nadu.
E-mail: drgomathi22@yahoo.com

Date of Submission: 28/02/2015.
Date of Peer Review: 02/03/2015.
Date of Acceptance: 10/03/2015.
Date of Publishing: 23/03/2015.