

Pulmonary Nocardiosis Presenting as Lung Abscess in an Immunocompetent Patient

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Abstract

A 58 year-old Thai man presented with high grade fever and right pleuritic chest pain before admission. The chest radiograph showed a right lower lung soft tissue mass. Fine needle aspiration under ultrasound guide was done, Gram's stain and culture grew branching gram positive filaments organism. The antimicrobials used trimethoprim-sulfamethoxazole orally. At the follow-up after 6 months, he was healthy appearing with normal chest radiograph.

Nocardia infection also called nocardiasis infection with bacteria called *Nocardia* which tend to strike the lungs, brain and skin, particularly in people with an impaired immune system. The majority (about 80%) of cases of nocardiasis involves lung infection, brain abscess or disseminated (wide spread) disease from *Nocardia*. The remaining 20% of cases are localized to the skin and cause cellulitis (skin infection) (Medicine Net).

While impaired cell-mediated immunity is significant risk factor for *Nocardia* infection, a substantial proportion of patients have no identifiable immunosuppression [1].

Pulmonary nocardiosis is an infrequent but severe infection that commonly presents as a subacute or chronic suppurative disease, mimicking a lung carcinoma, abscess or pulmonary tuberculosis [2].

This study obtained approval from the Ethics Committee for Research Involving Human Subjects of Bangkok Metropolitan Administration.

Case Report

A 58 year-old Thai man was admitted to a provincial hospital in May 2011 with high grade fever. Ten days before admission, he experienced high grade fever, cough with none purulent sputum, pleuritic chest pain at right side, severe malaise, loss of appetite and weight loss about 2 kg in 10 days. He was affected with hyper-uricemia and currently prescribed for an anti hyper-uricemic drug. He was seen by a physician at provincial hospital and had a chest radiographic that showed a right lower lung soft tissue mass diameter about 6cm. The computed tomography of chest with contrast study was performed; showing ill defined inhomogeneous enhancing mass at lateral segment of RLL which measured about 4.7 cm in diameter that adjacent to

pleura. He was prescribed medication for CAP and Influenza infection (Ceftriazone + macrolide + Oseltamivir) and then referred him to the provincial hospital for further management.

On admission at the provincial hospital, he had a temperature of 38°C, a blood pressure of 107/82 mmHg, a pulse rate of 105/minute, a respiratory rate of 14 per minute. He had in a good consciousness. The findings on respiratory examination showed no cyanosis, no clubbing of the fingers and the trachea was in the midline. There was normal in chest expansion, decreased breath sound, increased in vocal resonance and tactile fremitus at right lower lung field. Laboratory investigation revealed a hematocrit of 41 %, a white blood cell count of $7.77 \times 10^9/l$, predominate neutrophils (72%), and a platelet count of $336 \times 10^9/l$, none reactive of anti HIV.

A chest radiographic showed a pleural base mass at RLL diameter about 6 cm (Figure 1). Computed tomography of chest was previous described. (Figure 2) Sputum exam for Acid Fast Bacilli (AFB) for 3 days was shown negative staining; Gram stain was shown mixed organism and few branching gram positive filaments. Piperacillin plus Tazobactam were given for lobar pneumonia. Fine needle aspiration under ultrasound guidance was perform. Flank pus was aspirated about 0.5 ml. Evaluation of pus showed few branching form positive filaments for Gram's stain, positive branching filaments for modified AFB, negative stain for AFB. He was given the diagnosis of *Nocardia*



Figure 1: at admission date.

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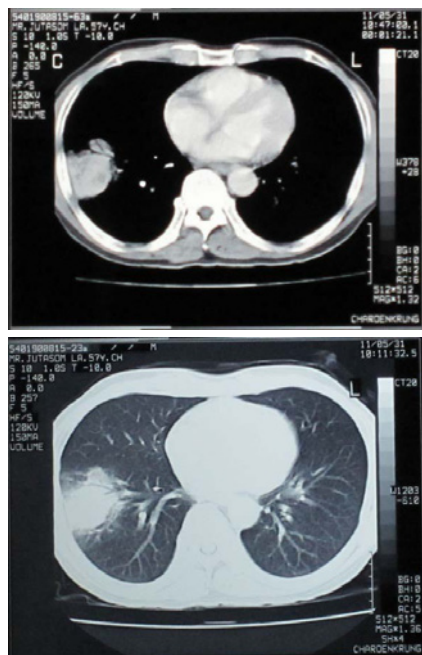


Figure 2: CT scan chest with contrast at admission date.



Figure 3: Three wks after treatment.

lung abscess. The antibiotic were continued and combined with Trimethoprim-sulfamethoxazole. Twenty four hours after combined treatment with Trimethoprim-sulfamethoxazole, the body temperature has gone to normal and clinical significant was improved. A pus culture for bacteria was reported growth of branching gram positive filaments organism, the culture for mycobacterium was no growth. Hemocultures were also no growth of both specimens. The patient was discharged from hospital 12 days later. On follow-up at 14 days after discharged, he appeared healthy. His chest radiograph was decrease in infiltration nearly normal. (Figure 3), without chest symptom, Trimethoprim-sulfamethoxazole was continued. At 3 months after treatment, he was in healthy condition and radiography was almost normal (Figure 4),

Trimethoprim-sulfamethoxazole were continue for 6 months. At 6 months he was in normal conditions and chest radiograph also is in normal (Figure 5).

Discussion

Nocardia spp. is aerobic, gram positive filamentous bacteria belonging to Actinomycetes and are responsible for localized or disseminated infection in animals or humans that has a world wide distribution and can be cultured from the soil [3,4].

Nocardiosis should be suspected in patients with sub-acute or chronic pulmonary infiltration and pleural effusion, particularly if the patient is immunosuppressed. Support for the diagnosis is obtained from a Gram's stain of the sputum, The bronchoscopic washing or pleural fluid revealed the typical Gram's positive branching filamentous bacteria, The acid-fast stain revealed variably acid-fast filamentous

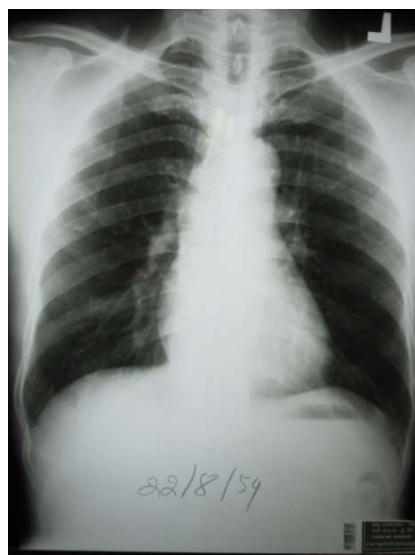


Figure 4: three month after treatment.

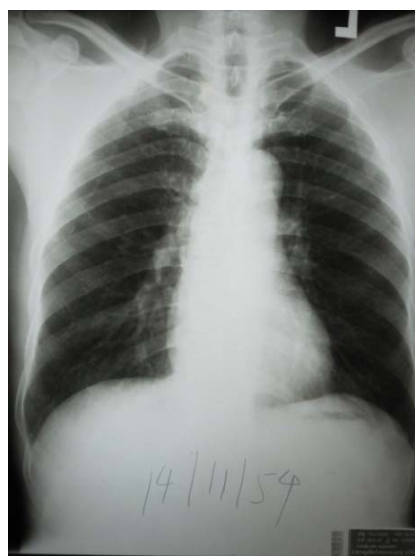


Figure 5: six month after treatment.

bacteria [5]. The immunocompetent subjects, the infection may run a chronic course and show a granulomatous reactions [6,7]. The definitive diagnosis was made by the demonstration of *N. asteroides* on aerobic bacterial culture from the sputum, bronchoscopic washings, or pleural fluid. Because *N. asteroides* is a slow growing organism, when nocardiosis is suspected the bacterial cultures must be maintained for at least 2 weeks. Not all patients have *N. asteroides* in the sputum. The lung is involved in about 75 % of patients with nocardiosis [8], and as many as 50 % of patients with pulmonary nocardiosis have a pleural effusion [9]. Patients with pleural effusions secondary to nocardiosis usually have associated with parenchymal infiltrates. The pleural fluid, in patients with nocardiosis is exudates, which can range from serous fluid to flank pus. Pleural fluid cultures may or may not be positive for *N. asteroides*.

In a series of 20 patients with positive sputum cultures for *N. asteroides*, nine of the patients did not have radiographic abnormalities [10]. Chest radiographs of patients with pulmonary nocardiosis may demonstrate fluffy infiltrates, irregular densities, pleural empyema, single or scattered regular or irregular nodules or masses which may have cavities, single or multiple abscesses and interstitial, reticulonodular, alveolar or rarely military infiltrates [11].

Nocardia species are ubiquitous environmental saprophytes, living in soil, organic matter, or water [4]. Animal-to-human, human-to-human, and vertical transmission have not been reported [12] they cause opportunistic infections among immunocompromised hosts, especially in patients with Human Immunodeficiency Virus (HIV) infection, but may be diagnosed by modified AFB stain or by culture. It grows mostly on nonselective media used routinely for cultures of bacteria, fungi, and mycobacteria [13]. The importance of infection caused by *Nocardia* is increasing because of the common predisposing factors for *Nocardia* infection were treatment for systemic lupus erythematosus, cancer, diabetes, and Acquired Immune Deficiency Syndrome (AIDS) [14].

Sulfonamides have been the mainstay of therapy of nocardiosis since the 1940s; trimethoprim-sulfamethoxazole is currently preferred in a dose of 15 mg/kg/day of trimethoprim and 75 mg/kg/day of sulfamethoxazole, either parenterally or orally. Treatment of pulmonary nocardiosis should be continued for 6 to 12 months. Central nervous system disease requires treatment for one year, unless all apparent disease has been excised, in which case 6 months is sufficient. For immunocompromised patients with nocardiosis, therapy should be continued for 12 months [15].

Conclusion

Pulmonary infection by *Nocardia spp.* could present with many features of chest radiographic, and clinically could be similar to other bacterial pulmonary infections. Nocardiosis should always be considered in the differential diagnosis of indolent pulmonary disease even in immunocompetent patients. However, the nature of pulmonary nocardiosis is usually suppurative.

References

1. King AS, Castro JG, Dow GC (2009) *Nocardia farcinica* lung abscess presenting in the context of advanced HIV infection: Spontaneous resolution in response to highly active antiretroviral therapy alone. *Can J Infect Dis Med Microbiol* 20: 103-106.
2. Gillespie SH, Hawkey PM (2006) *Principles and Practice of Clinical Bacteriology*. (2nd Edn), West Sussex: John Wiley & Son Ltd.
3. Winn WC, Allen SD, Janda WM, Koneman EW, Procop GW, et al. (2006) *Koneman's Color Atlas and Textbook of Diagnostic Microbiology*. (6th edn), Baltimore: Lippincott Williams & Wilkins.
4. Menéndez R, Cordero PJ, Santos M, Gobernado M, Marco V (1997) Pulmonary infection with *Nocardia species*: a report of 10 cases and review. *Eur Respir J* 10: 1542-1546.
5. Sorrell TC, Iredell JR, Mitchell DH (2000) *Nocardia species*. In: Mandell GL, Bennett JE, Dolin R (eds.) *Principles and practices of infectious diseases*. (5th edn), Churchill Livingstone, Philadelphia.
6. Apisarnthanarak A, Razavi B, Bailey T (2002) Disseminated *Nocardia asteroides* presenting as pulmonary non-caseating granulomas in a patient with Waldenstrom macroglobulinemia. *Infection* 30: 38-40.
7. Rolf MW, Strieter RM, Lynch JP (1992) Nocardiosis. *Semin Respir Med* 13: 216-233.
8. Uttamchandani RB, Daikos GL, Reyes RR, Fischl MA, Dickinson GM, et al. (1994) Nocardiosis in 30 patients with advanced human immunodeficiency virus infection: clinical features and outcome. *Clin Infect Dis* 18: 348-353.
9. Kramer MR, Uttamchandani RB (1990) The radiographic appearance of pulmonary nocardiosis associated with AIDS. *Chest* 98: 382-385.
10. Frazier AR, Rosenow EC 3rd, Roberts GD (1975) Nocardiosis. A review of 25 cases occurring during 24 months. *Mayo Clin Proc* 50: 657-663.
11. Kim OH, Yang HR, Bahk YW (1992) Pulmonary nocardiosis manifested as miliary nodules in a neonate--a case report. *Pediatr Radiol* 22: 229-230.
12. Bennett NJ, Domachowski J, Johann-Liang R (2007) Pediatric Nocardiosis.
13. Tantracheewathorn T, Lolekha S, Tantracheewathorn S (2004) *Nocardia pneumonia* with empyema thoracis in a healthy neonate: a case report. *J Med Assoc Thai* 87: 438-441.
14. Kageyama A, Yazawa K, Ishikawa J, Hotta K, Nishimura K, et al. (2004) Nocardial infections in Japan from 1992 to 2001, including the first report of infection by *Nocardia transvalensis*. *Eur J Epidemiol* 19: 383-389.
15. Tunkel AR, Crane JK, Hayden FG (1991) Pulmonary nocardiosis in AIDS. *Chest* 100: 295-296.