

# Nocardia otitidiscaviarum pneumonia in an immunocompetent host

Haroon Yousaf, Irfan Saddique

## ABSTRACT

**Introduction:** Nocardiosis is typically regarded as an opportunistic infection, but approximately one-third of infected patients are immunocompetent. We herein report a case of immune competent female with pulmonary *N. otitidiscaviarum* infection in whom complete cure was provided with a seven months of antibiotic combination including trimethoprim sulfamethaxazole. **Case Report:** A rare case of *Nocardia otitidiscaviarum* pneumonia, in an otherwise healthy 44-year-old woman who complained of febrile illness associated with sore throat, dry cough, myalgia and diarrhea. She had never been a smoker. Her clinical symptoms showed a rapid deterioration in the two weeks before admission, despite a course of oral antibiotics. Gram-staining of her sputum taken at the time of his admission showed the presence of gram-positive branching filamentous bacilli. Sputum culture and PCR confirmed the diagnosis of *Nocardia otitidiscaviarum*. The patient was treated with a combination of antibiotics and showed excellent clinical and radiological response one month after treatment initiation. **Conclusion:** The majority of patients with nocardial infection are immunocompromised, most often with cell-mediated abnormalities. However, nocardiosis should always be considered in the differential

**diagnosis of indolent pulmonary disease even in immunocompetent patients.**

**Keywords:** *Nocardia otitidiscaviarum*, Pneumonia, PCR

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## INTRODUCTION

Nocardiosis is an uncommon gram-positive bacterial infection caused by aerobic actinomycetes in the genus *Nocardia*. *Nocardia* spp. have the ability to cause localized or systemic suppurative disease in humans and animals [1–5]. Nocardiosis is typically regarded as an opportunistic infection, but approximately one-third of infected patients are immunocompetent [6]. We herein report a case of immunocompetent female with pulmonary *N. otitidiscaviarum* infection in whom complete cure was provided with a 7 months of antibiotic combination including trimethoprim/sulfamethaxazole.

## CASE REPORT

A 44-year-old Caucasian woman presented with a five-week history of a febrile illness associated with sore throat, dry cough, myalgia and diarrhea. Her clinical symptoms showed a rapid deterioration during the last two weeks before admission, despite a course of oral antibiotics (macrolide and b-lactam). She was a lifetime

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nonsmoker and used to work in an environment with no known exposures to chemicals, fumes, dust and other environmental or occupational allergens.

Medical history of patient consisted of hypertension, for which she was taking hydrochlorothiazide, and several episodes of gout, for which she was taking allopurinol. There were no complaints of loss of weight or appetite. There was no past history of tuberculosis, diabetes mellitus or steroid therapy. Her physical examination revealed that she was obese, had a body temperature of 39.0°C, a regular pulse of 112 beats/minute and blood pressure of 145/90 mm Hg. Her respiratory rate was 20 breaths/minute with oxygen saturation of 94% on room air, which decreased to 89% on ambulation. There was no pallor, icterus, cyanosis, finger clubbing or pedal edema. Her neck was supple. The examination of the lungs revealed bilateral expiratory wheezes 65 and rare rhonchi. Cardiac examination demonstrated normal first and second heart sounds with a regular rhythm and no murmurs. Her abdomen was soft and nontender, extremities were warm and the skin was dry. Laboratory work up revealed; sodium 142 mmol/L, potassium 4.7 mmol/L, chloride 108 mmol/L, bicarbonate 25 mmol/L, BUN 10 mg/dL, Creatinine 0.9 mg/dL, Glucose 108 mg/dL, White blood cell  $12.5 \times 10^9/L$ , Neutrophils 70%, Hemoglobin 7.1 mmol/L, Hematocrit 33%, Platelets  $423 \times 10^9/L$  and LDH 128 U/L. Results of an HIV screening test were negative, and the patient's CD4 + T lymphocyte count was 1080 cells/mm<sup>3</sup>. Chest X-ray and CT of the chest revealed left lower lobe consolidation and multiple nodular opacities. A direct gram-staining of his sputum taken at the time of his admission showed the presence of gram-positive branching filamentous bacilli (Figure 1). A standard culture and conventional identification of his sputum sample yielded 104 CFU/mL of *Nocardia* spp. after three days of incubation (Figure 2). Accurate identification at species level was achieved after 16S rDNA amplification and sequencing leading to the discovery of *N. otitidiscaviarum*. Using the disk diffusion method we found out that the isolate was resistant to rifampicin, erythromycin, gentamycin, doxycycline and vancomycin. Meanwhile, we found it susceptible to amoxicillin, trimethoprim/sulfamethoxazole, imipenem and ciprofloxacin (Figure 3). The patient improved clinically while receiving a three-week course of intravenous ciprofloxacin, amikacin, and trimethoprim sulfamethoxazole. One month later, his leukocyte count decreased to  $6.4 \times 10^9/L$  (50% PMNs) and the culture was negative. Patient was then started on a six-month course of oral trimethoprim and sulfamethoxazole and nebulized amikacin in order to eradicate the bacterium. During a follow-up examination after one year patient denied any fever, cough and his shortness of breath was fully resolved.

## DISCUSSION

The majority of patients with nocardial infection are immunocompromised, most often with cell-mediated

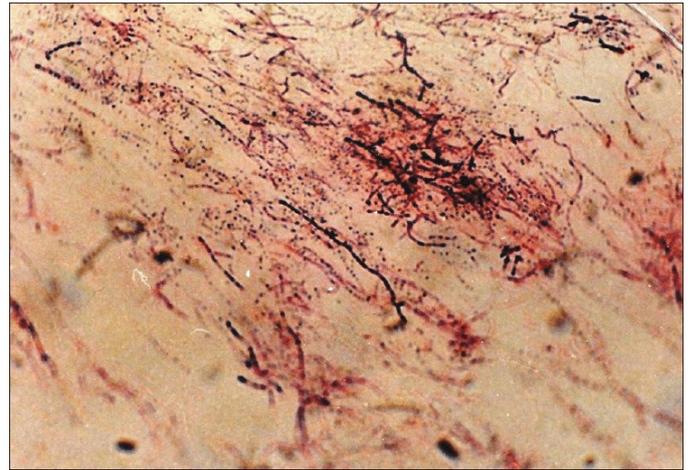


Figure 1: Sputum gram stain showing clusters of filamentous gram positive rods, consistent with actinomycotic colonies.

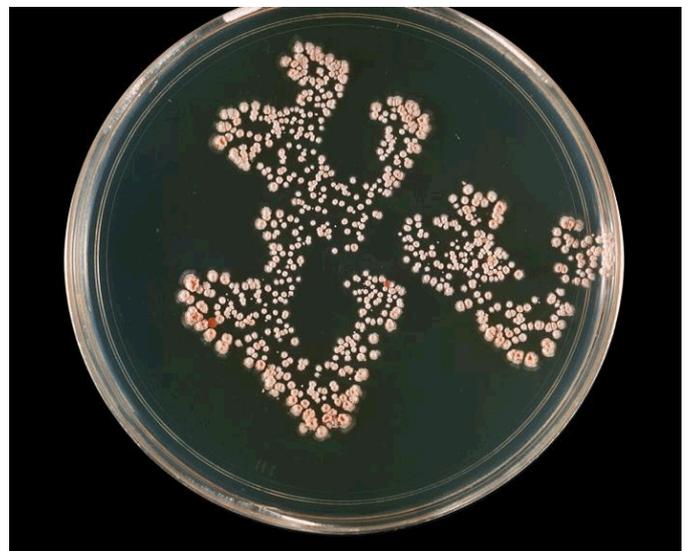


Figure 2: Plate culture of the bacteria *Nocardia* grown on 7H10 agar plates at 37° C.



Figure 3: Kirby-Bauer disk diffusion antibiotic-susceptibility test demonstrating sensitivity pattern of *Nocardia*.

abnormalities [3, 4]. However, nocardiosis should always be considered in the differential diagnosis of indolent pulmonary disease.

## CONCLUSION

Our case illustrates the need for a high index of suspicion of pulmonary nocardiosis even in immunocompetent patients.

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## Author Contributions

Haroon Yousaf – Substantial contributions to conception and design, Acquisition of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published  
Irfan Saddique – Substantial contributions to conception and design, Analysis and interpretation of data, Drafting the article, Final approval of the version to be published

## Guarantor

The corresponding author is the guarantor of submission.

## Conflict of Interest

Authors declare no conflict of interest.

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