Case Report

Nocardia abscessus - Associated subcutaneous infection in a patient with non-Hodgkin's lymphoma

Ahmet Karakaş, Abdullah Kılıç, Cumhur Artuk, Mutahher Akçaer, Duran Tok, Yüksel Yurttaş, Ömer Coşkun, Bülent Beşirbellioğlu

Abstract

This paper describes primary subcutaneous infection caused by Nocardia abscessus in a 60-year-old male patient with the history of non-Hodgkin's lymphoma and chronic lymphocytic leukemia. The patient was presented with pain and swelling in his left thigh for 45 days. Soft tissue ultrasonography showed a heterogeneous and hypoechoic mass consistent with an abscess. Gram-positive and branched filamentous bacilli, along with neutrophils, were identified in Gram-stained smears of the pus. The pus culture was positive for Gram-positive bacilli, which identified as N. abscessus. Initially, the patient was treated with trimethoprim-sulfamethoxazole (TMP-SMX). Due to insufficient clinical response, ceftriaxone was added for 2 weeks. Then, the patient was prescribed a 3-month course of TMP-SMX. It is important to start appropriate and effective treatment as soon as possible in patients with immunosuppression.

Introduction

Nocardia species are short, filamentous Gram-positive branching rods, which belong to the aerobic Actinomycetes group (1). They were first described in 1888 and had since been recorded worldwide in soil rich in organic matter. The Nocardia genus includes 86 species, nearly half of which are pathogenic to humans (2). In general, they cause disease in immunocompromised patients. The most common forms are pulmonary, central nervous system, cutaneous, and disseminated forms, respectively (2). The mortality is higher in cases of disseminated disease and central nervous system involvement. There is a close relationship between the clinical presentation and Nocardia species. Nocardia brasiliensis, Nocardia otitidiscaviarum, and Nocardia mexicana are associated with primary cutaneous involvement, and Nocardia abscessus, Nocardia asiatica, Nocardia farcinica, Nocardia cyriacigerogica, and Nocardia nova are associated with lung involvement. Nocardia wallacei and Nocardia paucivorans are associated with disseminated disease. Disseminated disease may also occur during the course of other clinical forms. Pustules, ulcers, cellulitis, pyoderma, subcutaneous abscesses, mycetomas, and lymphocutaneous spread are nonspecific manifestations of cutaneous nocardiosis (3). For a definitive diagnosis, the culture of samples obtained from the lesion is required.

Traditional biochemical methods may fail to identify Nocardia species. Although molecular methods are accepted as the gold standard, the high cost and the need for experienced staff are major disadvantages. Reported cases of Nocardia infections have increased with the use of new diagnostic methods such as matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS) in microbiology laboratories (4). MALDI-TOF MS can quickly identify isolated...
microorganisms from cultures at the species level. We describe an immunocompromised patient with a subcutaneous abscess caused by N. abscessus.

Case Report

A 60-year-old man with a 45-day history of pain and swelling in his left hip was referred to our hospital. In his medical history, 13 years earlier, he had received chemotherapy treatment for a diagnosis of non-Hodgkin’s lymphoma. He had also been diagnosed with chronic lymphocytic leukemia and treated with six cycles of chemotherapy 2½ years earlier. He had been involved with gardening in the past 3 years.

On admission, the physical examination revealed a fever of 38.5°C, pulse of 115 beats/min, and blood pressure of 110/70 mmHg. Laboratory test results showed a white blood cell count of 12500/µL (4.000-10.000/µL), C-reactive protein of 283 mg/L (0-8 mg/L), and an erythrocyte sedimentation rate of 70 mm/h (<20 mm/h). Soft tissue ultrasonography of his left hip showed a heterogeneous and hypoechoic mass of 12 cm × 8 cm × 7.5 cm, with an irregular border and extending along the body of the femur, consistent with an abscess. On the 4th day of hospital admission, the abscess was drained and the pus was cultured. Numerous Gram-positive and branched filamentous bacilli, along with neutrophils, were identified in Gram-stained smears of the pus. The samples were inoculated on 5% sheep blood, chocolate, and eosin methylene blue agar (Salubris, Turkey) and incubated at 35°C under aerobic conditions. On the 3rd day of incubation, Gram-positive and branching bacilli were isolated (Figure 1). The isolated colony was identified as N. abscessus using MALDI-TOF MS.

In light of the clinical and microbiological data, the patient was diagnosed with primary subcutaneous nocardiosis caused by N. abscessus and started on oral trimethoprim-sulfamethoxazole (TMP-SMX, 10 mg/kg TMP component). Due to his immunosuppressive status, a series of imaging studies of the lung and central nervous system were performed to rule out other possible involvement of infection. Imaging studies showed no abnormalities. On the 15th day of treatment, a second surgical procedure was done because of increased pus drainage in infection site. The TMP-SMX dose was increased to 15 mg/kg TMP component, and ceftriaxone (2 g/day) was added. On the 2nd week of combination treatment, drainage from infection site was disappeared. Then, the patient was discharged from the hospital with a 3 months course of the treatment.

Discussion

N. abscessus usually causes pulmonary and disseminated diseases (5). The first case of N. abscessus was reported in a patient with knee abscess in 2000 by Yassin et al (6). In a study consisted of 186 clinical isolates of Nocardia spp., the frequency of N. abscessus was 12.4% (all but one from respiratory samples) (7). In 127 clinical isolates (24% extrapulmonary), the frequency of N. abscessus was 15% (8). Disseminated (9), cutaneous (10), and cerebral (5) cases of N. abscessus have also been reported. Although various Nocardia spp. has been reported from Turkey (11,12), only one case of N. abscessus was reported in a cohort consist of 45 cases (13). The present case is the second reported case of N. abscessus from Turkey.

In immunocompetent patients with nocardiosis, 6 months of treatment is usually enough, whereas no consensus on the duration of treatment in immunocompromised individuals. Despite appropriate therapy, nocardiosis-related mortality is high (14). Sulfonamides are the first line drugs for nocardiosis treatment. However, as Nocardia spp. shows different antimicrobial susceptibility patterns in life-threatening conditions, such as disseminated, cerebral, and pulmonary nocardiosis; the treatment must be guided by the susceptibility results of isolated Nocardia spp. Previously, N. abscessus was called “Nocardia asterodies complex antimicrobial susceptibility pattern-I.” The pattern-I is susceptible to ampicillin, amoxicillin-clavulanate, ceftriaxone, linezolid, and amikacin but resistant to imipenem (most of the strains), ciprofloxacin, and clarithromycin (2). In a previous study, all N. abscessus strains were susceptible to aminoglycosides, amoxicillin-clavulanate, cefepime, ceftriaxone, linezolid, and TMP-SMX. In the same study, the susceptibilities to quinolone,
imipenem, and doxycycline were 11%, 22%, and 89%, respectively (15).

**Conclusion**

In *Nocardia*-infected patients, it is important to start appropriate and effective treatment as soon as possible. In the present case, using the MALTI-TOF MS technique, the bacilli grown in culture were identified as *N. abscessus* in a very short time, enabling prompt treatment commencement.

**References**

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