

Thigh Abscess Due to *Nocardia Farcinica*

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Nocardia farcinica is an uncommon cause of nocardiosis and usually infects immunocompromised individuals. We describe a patient with Hodgkin's disease and a thigh abscess due to *N. farcinica*. To the best of our knowledge, this has never been reported before in the English literature. It is important to recognize this complication, because a delay in diagnosis may result in widespread dissemination. Unless initially suspected, culture and identification will be delayed, as selective media for isolating *Nocardia* are not routinely used in most clinical laboratories. It is also important to differentiate *N. farcinica* from other *Nocardia* species due to its resistance to many antibiotics that are routinely used to treat abscesses, including cephalosporins. A case report along with literature review is presented in an effort to stress the importance of including this pathogen in the differential diagnosis of immunocompromised patients with abscesses.

Key words: *Nocardia farcinica* ■ Hodgkin's lymphoma ■ thigh abscess ■ immunosuppression

INTRODUCTION

Members of the genus *Nocardia* are partially acid-fast, aerobic soil saprophyte, branched gram-positive pathogens, commonly found in patients with acute or chronic suppurative or granulomatous diseases.¹ The majority of infections are acquired through inhalation, and almost 90% of patients have pulmonary involvement. As the infection progresses, hematogenous dissemination occurs first in the central nervous system. This is usually followed by the skin and soft-tissue involvement.² Other frequent sites include bone, retina, heart (endocarditis), joints and kidneys. Infection by *Nocardia farcinica* comprises a minority of infections by *Nocardia* species. In the past, *N. farcinica* was classified in the *N. asteroides* complex. Recently, it has been identified as a species distinct from *N. asteroides*. We describe a case of thigh abscess caused by *N. farcinica* in a patient on chemotherapy for Hodgkin's disease.

Case Description

A 65-year-old Caucasian female was diagnosed with stage-IIA infradiaphragmatic Hodgkin's lymphoma based on a lymph node biopsy from the left inguinal region and associated retroperitoneal, para-aortic and pelvic lymphadenopathy detected on computed tomography (CT) scans of the abdomen and pelvis.

Chemotherapy was initiated with methotrexate, vinblastine and bleomycin. Two weeks after the third cycle of chemotherapy, she presented with chills, nausea and swelling in the right thigh. She denied any trauma or insect bites. Physical examination revealed elevated body temperature (37.5°C). There was a 5-cm tender and erythematous mass on the anterolateral aspect of her right mid-thigh. Her right femoral, popliteal and dorsalis pedis arteries were not palpable. Significant laboratory findings included elevated leukocyte count (13,700/mm³, reference range 4,000–11,000/mm³), C-reactive protein (11.1 mg/dl, reference range 0–0.9 mg/dl), creatinine (1.9 mg/dl, reference range 0.7–1.4 mg/dl) and erythro-

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cyte sedimentation rate (60 mm/hr, reference range 0–20 mm/hr). Blood and urine samples were sent for microbial cultures. A CT scan without contrast (since creatinine was high) of her right thigh demonstrated a 3-cm mass with surrounding edema in the vastus lateralis muscle and adjacent fat, radiologically suspicious for a hematoma or an abscess. Arterial Doppler and ultrasound examination demonstrated stenosis of superficial femoral and dorsalis pedis arteries and confirmed the presence of a mass in her right mid-thigh. An incision and drainage of the thigh mass was performed, revealing white purulent material.

Microbiological Findings

Examination of the purulent material showed a few leukocytes and several branching rods on gram stain. They were also acid-fast (AFB stain), suspicious for *Nocardia* species. The organism grew with opacification of Middlebrook 7H10 agar at 45°C. Identification of *N. asteroides* group was confirmed by hydrolysis of esculin and nondegradation of adenine, casein, hypoxanthine and tyrosine. The organism was then confirmed as *N. farcinica* by acid production from L-erythritol, D-glucose and L-rhamnose. The organism was sensitive to amikacin, amoxicillin/clavulanic acid, ceftriaxone, imipenem, trimethoprim/sulfamethoxazole and minocycline. It was resistant to ciprofloxacin, tobramycin and clarithromycin.

Treatment was initiated on trimethoprim (160 mg)/sulphamethoxazole (800 mg) twice a day. She remained on the drugs for three months, following which the infection resolved.

DISCUSSION

In the United States, there are an estimated 500–1,000 new cases of nocardiosis diagnosed each year.³ On the basis of epidemiological surveys conducted in France and Italy, the annual estimated incidence of human nocardiosis is 150–250 and 90–130 cases, respectively.^{4,5} Nocardiosis occurs more frequently in males than in females for unknown reasons.

Most patients with *Nocardia* infections have varying degrees of immune deficiency. They are reported with an incidence of 2.3% in renal transplant recipients,⁶ 0.06% in cancer patients,⁷ 0.3% in bone marrow transplant recipients,⁸ and 0.38–1.8% in HIV-positive patients.^{9,10} Impaired pulmonary defense as seen in chronic obstructive pulmonary disease or other chronic lung condition also predisposes to pulmonary nocardiosis, particularly in patients requiring long-term corticosteroid treatment.^{1,11} It may involve any organ system in immunosuppressed patients and may manifest as bronchopneumonia, cavitary pneumonia, empyema, brain abscess, subcutaneous nodules, abscesses or cellulitis.¹² Other predisposing factors to

nocardia infections are diabetes mellitus, collagen vascular disease, alcoholism and penetrating wounds due to trauma.

Although uncommon, nocardiosis can occur in immunocompetent patients with a reported incidence of 10–25%.^{3,4,11,13} Healthy hosts with *Nocardia* infections often have percutaneous trauma resulting in soft-tissue inoculation.^{3,14}

In North America, most infections are caused by *N. asteroides* (90%), followed by *N. farcinica*, *N. nova* and *N. brasiliensis*.¹⁵ Dissemination is especially prevalent with *N. farcinica*.^{15,16} *N. brasiliensis* typically produces localized infection induced by skin trauma.¹⁵

Differentiation of *N. farcinica* from other *Nocardia* species is important, because *N. farcinica* has a high degree of resistance to various antibiotics, especially to the extended-spectrum cephalosporins, which may make it difficult to treat.^{17,18} Human and animal infections with *N. farcinica* may occur more frequently than previously recognized.^{16,19,20} This has been attributed to underdiagnosis or possibly a change in the spectrum of human nocardiosis in countries such as Germany, where *N. farcinica* is the more prevalent species.²¹ *N. farcinica* is often reported as the cause of postoperative wound infections in patients undergoing cardiac and other vascular surgeries.^{22–25} Unusual reported sites of involvement due to *N. farcinica* include subretinal part of the eye, sublingual space and the cornea.^{19,26,27}

In three large series of patients with pulmonary and systemic nocardiosis, 29–54% of patients had lymphoma.^{12,28,29} A review of literature revealed only a few cases of nocardiosis in association with Hodgkin's disease. Most were due to infection by *N. asteroides*.^{28,30–32} Our patient presented with a localized swelling of her thigh. The initial differential diagnosis included an abscess, hematoma or a recurrence of lymphoma in the soft tissue. There was additional concern of the mass compressing the major vessels of the lower extremity, causing ischemia. Hence, a vascular surgery consultation was obtained. Subsequent investigations, including microbiological evaluation, revealed an abscess due to *N. farcinica*, which responded to prolonged therapy with trimethoprim/sulfamethoxazole.

Due in part to its low incidence, nocardiosis is usually not considered in the initial diagnosis, and selective media are not routinely used for identification in most microbiology laboratories. Identification by standard methods is a lengthy process compounded by the fact that these organisms grow poorly in standard culture media and may be misinterpreted as contaminants. This can delay the start of appropriate antibiotic therapy, and such a delay may lead to dissemination of infection and a higher morbidity and mortality.¹⁶ Multiple specimens, often

from different body sites, may be needed—particularly in systemic infections.

Sulpha drugs remain the treatment of choice and may improve survival when used alone or in combination with other drugs.¹⁵ Primary agents that have been used successfully include minocycline, amikacin, imipenem and linezolid.¹⁵ For systemic disease, combination therapy is recommended. The duration of therapy is uncertain but should be protracted due to occurrence of considerable relapses with shorter duration of therapy. Some authors have recommended treatment for 12 months in immunocompromised patients or any patient with CNS involvement. Otherwise healthy patients with systemic involvement should receive a 6–12 month course of antibiotics and those with localized cutaneous infections may be treated for 2–4 months.¹⁶ Prognosis is excellent with isolated cutaneous involvement. However, with systemic involvement, the mortality ranges from 15–63%.^{2,6,7,9,10,13,19}

In conclusion, we recommend that all abscesses from immunosuppressed patients be routinely put up for *Nocardia* culture regardless of the site of infection. Multiple specimens may be necessary for appropriate microbial diagnosis. Therapy should be protracted to ensure complete resolution of the infection.

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