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Case Report

Cutaneous Type of Nocardiosis Caused by *Nocardia brasiliensis* in an Elderly Patient☆

Chen-Yi Su [1,2], Chung-Shu Lin [3], Sui-Hing Yan [1], Chung-Kwe Wang [1]*

[1] *Department of Internal Medicine,* [2] *Division of Infectious Medicine,* [3] *Department of Plastic Surgery, Taipei City Hospital, Renai Branch, Taipei, Taiwan*

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SUMMARY

Acute soft tissue infection with *Nocardia brasiliensis* is an uncommon manifestation in the elderly. A case of cellulitis and an abscess on the foot due to *N. brasiliensis* in a 77-year-old man with chronic obstructive pulmonary disease is reported. *N. brasiliensis* was isolated from fluid from the bulla. Treatment with trimethoprim–sulfamethoxazole for 6 months led to complete resolution and no evidence of recurrence was noted. Nocardia infection must be considered in the differential diagnosis for elderly patients with soft tissue infection, especially in those with severe underlying diseases, and we suggest that trimethoprim–sulfamethoxazole is an effective and safe treatment.

1. Introduction

Acute soft tissue infection with *Nocardia brasiliensis* is an uncommon manifestation in the elderly[1], but is probably a more frequent cause of disease than is believed. Cutaneous nocardiosis can be divided into primary cutaneous nocardiosis precipitated by trauma or due to other causes[2], and secondary cutaneous nocardiosis precipitated by pulmonary infection. Localized infection of soft tissue occurring in the absence of pulmonary lesions is often diagnosed by examination of the wound discharge with acid-fast stain and *Nocardia* ID QUAD plates. However, this approach is rare in Taiwan given the rarity of the infection. We recently encountered a case of primary cutaneous nocardiosis with soft tissue infection over the right foot in a 77-year-old man with underlying chronic obstructive pulmonary disease. The infection was successfully treated with trimethoprim–sulfamethoxazole.

2. Case report

A 77-year-old man was admitted to the Taipei City Hospital, Renai Branch, on December 11, 2009 because of redness of the right foot and pain that had worsened in the 7 days prior to hospitalization. The patient had previously visited a local clinic for management of the symptoms and had been prescribed a 7-day course of amoxicillin. The patient had a history of chronic obstructive pulmonary disease without cutaneous disease for several years, and had on several occasions received systemic adrenocorticosteroids. The patient worked with soil and manure in a chicken run. There was no history of fever, chills, preceding injury to the affected area or sweats; preceding exposure to salt water, a recent cat scratch, rat bite, or rabbits; or travel outside Taiwan in recent years. Laboratory findings on samples collected after admission were: white blood cell count, 9920/mm^3 (80.7% segmented, 8.4% lymphocytes, 7.2% monocytes, 3.6% eosinophils, 0.1% basophils); red blood cell count, $409 \times 10^{4-}$/mm^3; hemoglobin, 13.5 g/dL; and platelets, 9.1×10^4/mm^3. Blood chemistry results included alanine aminotransferase, 26 U/L; blood urea nitrogen (BUN), 19 mg/dL; and blood sugar, 107 mg/dL. A physical examination conducted at the time of admission revealed a tender 10 cm × 10 cm erythematous lesion with a sharp demarcated oval bulla on the dorsal aspect of the right foot, with surrounding local edema that extended over the ankle. There was no crepitus, purulence, exudate, or loss of motor function or sensation distal to the lesion. The head, neck, lungs, heart, abdomen, and other extremities were normal. A neurologic examination was negative. The patient's blood pressure was 139/95 mmHg, his pulse rate was 92/min, and his temperature was 36.2°C. There were rales over the right lower lung field and dysnea with productive cough. A culture

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* Correspondence to: Dr Chung-Kwe Wang, Department of Internal Medicine, Taipei City Hospital, Renai Branch, No. 10, Section 4, Renai Road, Taipei 10649, Taiwan.
E-mail address: daa80@tpech.cov.tw (C.-K. Wang).

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of bulla fluid grew *N. brasiliensis* after 3 days. The organism dissolved casein and tyrosine agar, but not starch or xanthine agar, and was positive in an acid-fast stain, consistent with its identity as *N. brasiliensis*. A skin biopsy and debridement were performed on December 16 (Fig. 1). Specimens were obtained from the primary skin lesions on the right foot. Microscopic examination of the specimens revealed a skin ulcer with acute necrotizing inflammation and a few regenerative atypical squamous cells, necrotic debris, and some infiltration of polymorphonuclear leukocytes (Fig. 2). Treatment with oral trimethoprim (13 mg/kg per day)—sulfamethoxazole (65 mg/kg per day) was instituted. Follow-up examination 3 days later revealed improvement of the clinical skin lesion and the absence of *N. brasiliensis* in a wound culture.

Thereafter, erythematous swelling of the right foot subsided, the ulcer diminished in size, the bulla diminished, and pain was alleviated. Ten days after admission to the hospital, the affected foot displayed mild pigmentation with a small open wound. Subsequent examination revealed no new skin lesion. The patient was discharged 11 days after admission with a prescribed regimen of trimethoprim (13 mg/kg per day)—sulfamethoxazole (65 mg/kg per day) for 14 days followed by trimethoprim (6.5 mg/kg per day)—sulfamethoxazole(33 mg/kg per day) for 6 months. No evidence of recurrence was observed after trimethoprim—sulfamethoxazole treatment was discontinued. There were no signs of reactivation of *Nocardia* infection.

3. Discussion

Approximately 1100 cases of nocardial infection are diagnosed annually in the USA; of these, 85% are pulmonary and systemic infections. Nocardiosis is a localized and disseminated disease that is most commonly caused by *N. asteroides* and less often by *N. brasiliensis* and *N. caviae*. *N. brasiliensis* is usually associated with skin-limited disease.

Nocardia are Gram-positive, weakly acid-fast, dichotomous branching bacilli that are ubiquitous soil saprophytes worldwide. They are not normal flora in humans or animals, and hence infections can be difficult to recognize, which leads to misdiagnosis and consequently underestimation of the incidence of nocardiosis[3]. The most commonly recognized human infection due to *N. brasiliensis* is pneumonia, yet the usual portal of entry is through the respiratory tract. The body site most frequently involved is the lung[4,5], followed by the skin and the brain. Nocardiosis may also involve kidneys, joints, heart, eyes, and bones[6–8]. Complications of nocardial infection vary, depending on the parts of the body involved. Certain lung infections may lead to scarring and chronic shortness of breath. Skin infections may lead to scarring or disfigurement. Brain abscesses may lead to loss of neurological function. Skin and subcutaneous involvement is present in approximately 10% of patients. *Nocardia* organisms are often found in the soil and are extensively distributed in nature. Nocardial infections occur worldwide, particularly in tropical and subtropical environments. Although a common cause of skin infections in the Third World,

Fig. 1. Course of treatment. Clinical features (A) at the first visit and (B) 3 days, (C) 10 days and (D) 6 months later.