

Lymphocutaneous Nocardiosis with Multiple Subcutaneous Nodules Distributed over the Extensor Aspect of the Forearm

Report of a Case

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We report a case of lymphocutaneous nocardiosis due to *Nocardia brasiliensis*, marked by multiple subcutaneous nodules and abscesses on the extensor aspect of the left forearm in a 53-year-old woman with systemic lupus erythematosus. Nine months before she was first examined, she had fallen on a concrete surface. A nodule had appeared 2 months later at the same site and had expanded and been followed by others, which finally covered most of the extensor aspect of the forearm. We speculated that the bacteria may have been conveyed retrogradely via the lymph vessels in a distal direction, perhaps as a result of the trauma and the subsequent development of an intradermal lesion. **Key word:** *Nocardia brasiliensis*.

(Accepted April 11, 1994.)

Acta Derm Venereol (Stockh) 1994; 74: 447-448.

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Cutaneous nocardiosis is a localized or disseminated suppurative infection caused by actinomycete. In studying the present case of lymphocutaneous nocardiosis, we examined a patient with systemic lupus erythematosus (SLE) who had received an abrasion on the left elbow and had later developed a specific clinical picture of multiple subcutaneous nodules and abscesses covering the entire extensor aspect of the left forearm. We found that *Nocardia brasiliensis* was present in these lesions. We report this case because such symptoms are extremely rare and may be of importance for diagnostic purposes.

CASE REPORT

The patient was a 53-year-old Japanese woman, a widow who lived in Osaka. She had had SLE for 14 years and was taking 1.5 mg oral doses of betamethasone per day. Nine months before her first examination, she had fallen on a concrete surface and received some contusion and abrasion to the lateral aspect of the left elbow. Some particles of the



Fig. 1. Multiple nodules and subcutaneous abscesses covering the extensor aspect of the left forearm.



Fig. 2. The infiltration of numerous lymphocytes, neutrophils and plasma cells can be seen in the entire dermis, from the upper to the deep layers (H&E staining $\times 100$).

Table I. Physiological and cell wall characteristics of the causative organism

Symbols: +, positive; -, negative.

Cell wall composition		
Sugars:	Arabinose	+
	Galactose	+
Diaminopimelic acid:	Meso-type	+
	LL-type	-
Physiological characteristics		
Acid fastness		
Decomposition of:		
	Adenine	+
	Casein	+
	Hypoxanthine	+
	L-tyrosine	+
	Xanthine	-
	Urea	+
Acid production from:		
	Arabinose	-
	Adonitol	-
	Glucose	+
	Galactose	+
	Inositol	+
	Mannose	-
	Maltose	-
	Rhamnose	-
	Sorbitol	-

concrete had penetrated the skin. Two months later, an area of erythema had appeared on the ulnar side of the elbow, followed by the formation of a nodule that soon became ulcerous and began to discharge pus. The patient had been treated by a local physician, but after a month, the extensor aspect of her forearm was covered with many nodules, and so she presented at our dermatology department.

On examination, we observed multiple fingertip-sized nodules with slightly depressed centers, distributed over the left elbow and the extensor aspect of the forearm. There was subcutaneous purulence in some nodules (Fig. 1). No fistulae were present, and we noticed no swelling of the axillary lymph nodes.

Results of laboratory tests were as follows: red blood cell count, $2.9 \times 10^9/\text{mm}^3$; hemoglobin, 9.9 g/dl; LDH, 467 U/l; BUN, 38.4 mg/dl; UA, 8.8 mg/dl; creatinine, 1.6 mg/dl; urinary protein, ++; ANA, 160 times; anti-DNA Ab, 80 times; and CH_{50} , 42.9 IU. No other abnormalities were detected. Nor did radiography of the chest and of the bones of the left forearm reveal any abnormalities.

A biopsy was taken from the nodule on the extensor aspect of the left forearm, and the histopathological findings with hematoxylin and eosin staining included the infiltration of numerous lymphocytes, neutrophils and plasma cells extending from the upper layers of the dermis through to the deep dermis (Fig. 2). Serial sections were examined but no grains were seen; nor were any bacillary bodies found using Gram's stain.

For our microbiological examination, we inoculated Sabouraud's culture medium with the skin biopsy specimen and cultured it. The colonies obtained as a result were yellowish-brown and convoluted in form. The physiological properties and cell wall characteristics of the causative organism are presented in Table I. Our observations led to the identification of this organism as *Nocardia brasiliensis*.

The patient was treated orally with minocycline 200 mg/day, and 5 months later, the lesions had cicatrized and healed completely. In the 2 years and 6 months since, there has been no recurrence.

DISCUSSION

Authors differ slightly in their classifications of the clinical types of cutaneous nocardiosis (1-5). In Japan, four categories have been established: (1) nocardial mycetoma, a chronic granulomatous mass with draining sinuses; (2) localized cutaneous nocardiosis, such as abscess and cellulitis; (3) lymphocutaneous nocardiosis, characterized by a primary inoculation site with spread of infection through the lymphatics in a chaining nodular pattern; and (4) nocardial metastatic subcutaneous abscesses (5).

In the present case, a nodule was formed in exactly the same spot as the trauma to the elbow, and many nodules and abscesses later appeared on the extensor side of the forearm, so that the clinical picture of the case was extremely specific. Since no abnormalities were found in radiographic examinations of the chest, and no lesions were detected in the internal organs, we considered that the case ought to be classified either as localized cutaneous nocardiosis or as lymphocutaneous nocardiosis. If the latter classification is accepted, the microorganism concerned should have been carried through the lymph vessels by the flow of lymph beyond the forearm into the upper arm. However, since the lesion appeared in the forearm after the left elbow had been injured, we speculated that the distal dissemination of the organism was due to a blockage of the lymph vessels, resulting in retrograde lymph flow. Another possible route of dissemination is by autoinoculation of the organism as a result of scratching and breaking the nodule on the elbow. However, the patient herself denies this, saying that she has no memory of scratching the nodule. Since clinical observation showed that the sites of the nodules and abscesses were subcutaneous, we consider that there is a high possibility that the lesion grew and spread to the entire forearm from the elbow because of lymph vessel blockage and retrograde lymph flow. It is extremely rare for a subcutaneous nodule to multiply in this manner, and the contents of this report are thought to be of importance for diagnostic purposes.

ACKNOWLEDGEMENT

We wish to express our gratitude to Dr. Yuzuru Mikami, of the Division of Experimental Chemotherapy, Research Center for Pathogenic Fungi and Microbial Toxicoses, Chiba University, for his identification of the organism in this case.

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