Mycobacterium fortuitum Infection Caused by a Nerve Block

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With its nerve blocking effects, intralesional injection (ILI) is a treatment method commonly used for controlling inflammation and pain syndromes in zoster patients. We herein report a case of chronic subcutaneous disease in a 52-year-old female patient caused by *Mycobacterium fortuitum*. Clinically, the lesion was arranged in a linear fashion, coinciding with the previous zoster site where we performed an ILI. Incision and drainage of the individual abscess pockets, with subsequent ingestion of antibiotics, was effective in our patient.

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Key Words: Mycobacterium fortuitum, Intralesional injection, Zoster site

INTRODUCTION

Soft tissue infections are rarely caused by atypical mycobacteria, but among them, *Mycobacterium fortuitum* (M. *fortuitum*) is one of the most common[1]. M. *fortuitum* is a rapidly growing mycobacterium, which is normally present in water, soil and dust. Although rarely a pathogen, direct inoculation of contaminated materials via injection, surgery and penetrating trauma can result in soft tissue and skeletal infections[2-4]. Tissue biopsy, special staining, mycobacterial culture and PCR restriction analysis (PRA) are performed for identifying this particular etiologic agent[5].

Here we report a case of soft tissue infection caused by M. *fortuitum*, which developed in a 52-year-old female after receiving a nerve block on the previous zoster site.

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CASE REPORT

A 52-year-old female with post herpetic neuralgia was referred to our department. To lessen the pain and pruritus of the right T9-10 dermatome, two sessions of ILI were given at an interval of one week. One month after the initial injection, multiple, erythematous subcutaneous nodules developed in a linear pattern, coinciding with the injection sites (Fig. 1A & B). On close examination, the lesions were targetoid with a peripheral halo and were painful on touch. We initially considered the lesions as an isotopic response with erythema multiforme over the previous zoster site. A biopsy was performed to aid diagnosis.

Histopathologic examination revealed severe perivascular lymphocytic infiltrates in the upper dermis, with little epidermal change. Under the impression of erythema multiforme, symptomatic treatment was given; 20 mg/day of systemic corticosteroids and antihistamines were prescribed to relieve local heat sensation and severe pruritus. But in less than a week, the lesions progressed into fluctuant subcutaneous abscess pockets. We performed an incision and drained the clear orange colored fluid from the abscess pockets. Bacterial culture from the tissue fluid was negative. Despite empirical doxycyclin (200 mg/day) and daily wound dressing, the abscess

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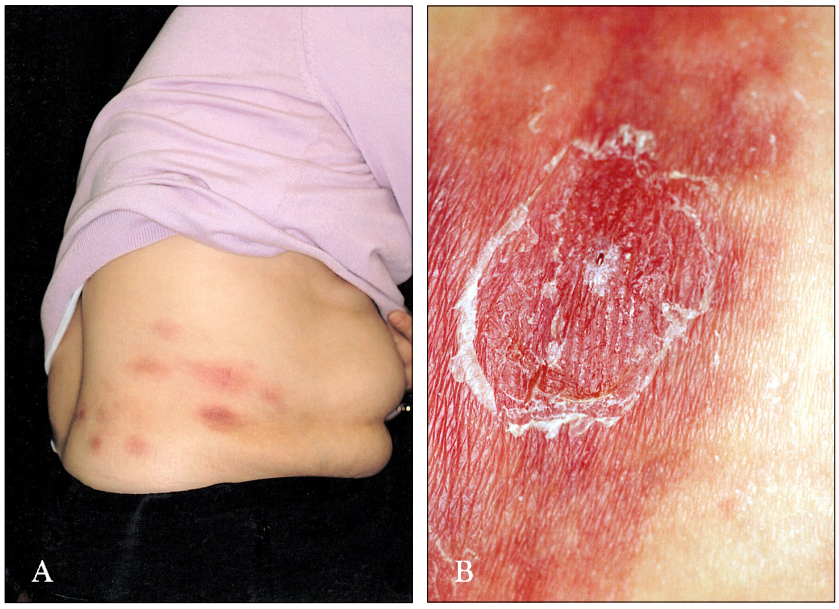

Fig. 1. A & B. Multiple, erythematous subcutaneous nodules developed in a linear fashion on the previous zoster sites. On close examination, the lesions were targetoid and scaly with a central punctum.

Fig. 2. Culturing of the tissue sample in the Ogawa media (3% KH_2PO_4) produced individual, small, colony islands without pigmentation at the 5-7th day.

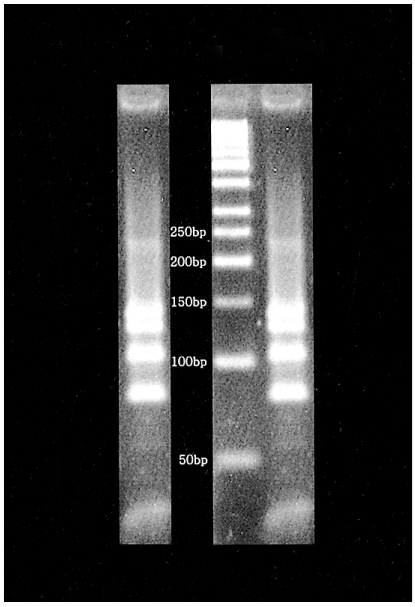

Fig. 3. PRA patterns from *Hae*III digests of amplicons of the clinical isolate (3rd lane) and the reference strain of M. *fortuitum* (ATCC 49403, 1st lane) are shown. Our patient's bands are identical to the reference bands (150, 130, 105 and 80 bp). The 2nd lane is a DNA size marker.

pockets gradually increased in size and number. From the persistent nature of the lesions, we suspected infection by mycobacterium and carried out a second biopsy, AFB staining (both tissue and fluid), culturing and PRA for confirmation. Histological features of the second biopsy specimen were similar to those from the initial biopsy and all special staining, including the Ziehl-Neelsen stain were negative. However, direct AFB staining of the fluid discharge was positive (3+). By observing the rapid growth of non-pigmented, small, round and smooth-surfaced colonies on the Ogawa media (Fig. 2) and from the identical PRA patterns between the

reference strain of M. *fortuitum* (ATCC 49403) and our sample (Fig. 3), we identified the etiologic agent as M. *fortuitum*. All remaining and newly developed abscess pockets were incised and drained. The patient was treated with a double drug regimen (clarithromycin 1500 mg/day and ciprofloxacin 1500 mg/day) for 3 months from our drug susceptibility study. The patient has been followed up regularly since terminating therapy and signs of recurrence have not been detected so far.

DISCUSSION

M. *fortuitum* is a rapidly growing mycobacterium that belongs to group IV within the Runyon classification[5]. The organism is responsible for a number of infections which tend to be chronic, recurrent and resistant to treatment[2]. The majority of patients have a history of trauma at the infection site. In our case, the patient received 2 sessions of nerve block at the previous zoster sites. Initially, there was no change to the injection site, but tender erythematous nodules began to develop a month after the first injection.

The histopathologic findings of M. *fortuitum* infection are variable[6] and are highly dependant on the clinical severity of the lesion. Acute or chronic inflammation may be the sole finding in some cases, but others may show tuberculoid granulomas or abscesses. The detection rate of acid-fast bacilli from tissue staining depends on the histolopathologic findings[6]. Overall, the detection rate is not high, and it may be negative in many cases. Perivascular lymphocytic infiltration was the only notable finding in our biopsy specimen and all special stainings, including Ziehl-Neelsen stain, were negative. Since the diagnostic reliability of clinical, histopathological findings and special staining is low, confirmation is possible through culturing and PCR restriction analysis (PRA). M. *fortuitum* grows quickly, usually in 5-7 days, at 35-37℃. Their colonies are separate, small, round islands that usually lack pigmentation[7,8]. The culturing of our patient's tissue samples on Ogawa media (3% KH_2PO_4) produced colonies with the same features. From the culture findings, we could rule out slow-growing mycobacteria since they grow after 3 to 6 weeks. Nocardia was also excluded because their colonies have features of branching filaments. For further identification, we performed a PRA. Differentiation of M. *fortuitum* from M. *abscessus*, another rapidly-growing mycobacterium, was possible by comparing the DNA homology. The reference strains that were used for M. *fortuitum* and M. *abscessus* are ATCC 49403 and ATCC 19977 respectively. Whereas the amplified DNA of M. *fortuitum* produce four bands (150, 130, 105 and 80 bp) after digestion with *Hae* III, only three bands (145, 105, 80 bp) are normally identified in M. *abscessus*.

Since its initial isolation from an injection abscess in 1938 by Dacosta Cruz, M. *fortuitum* has been reported in various sources including outbreaks caused by contaminated needles[2]. The contaminated needles, syringes, drugs or instruments are likely causes of iatrogenic infection by M. *fortuitum*. Since we only used disposable needles, we suspect that the injected substance was most likely the causative source of M. *fortuitum* infection. The substance commonly used for zoster site injection is a mixture of triamcinolone and lidocaine. For convenience and saving time, we prepared a stock solution in the morning and kept the mixture bottle for a day, and therefore other patients had the chance to receive an ILI with the same contaminated solution. Surprisingly, however, similar cases have not occurred. It is hard to explain such findings, but our patient may have been more susceptible to infection or, the concentration of M. *fortuitum* might have been higher in the solution injected to this particular patient. As a matter of fact, the solution may not have been the source of M. *fortuitum* infection. Currently, the injectable solutions are freshly prepared in our department to prevent such incidence.

Surgical treatment normally involves wide excision or a thorough lay open and curettage of the sinus tracks and abscess cavities, as there are numerous fistulous tracks and satellite abscesses that penetrate much deeper than can be appreciated from the surface[9]. But some propose that surgical management should not be considered as a first-line treatment since it causes disfiguring scars[10]. An associated combination of antibiotics therapy for an adequate period of time is necessary for wound healing and the prevention of recurrence. M. *fortuitum* is usually resistant to anti-tuberculosis medication and it is crucial to perform a drug susceptibility test due to its variable response to antibiotics. Currently, clarithromycin, ciprofloxacin, amikacine and cefoxitin are considered as first-line drugs[10]. It is recom-

mended that the antibiotics should be given for a minimum period of 3 months[9] or for a period of 3-6 weeks after the wound heals completely[11]. In our case, incision and drainage of the multiple abscess pockets was performed to relieve tension caused by the fluid within the individual lesion and to collect tissue fluid for culture. After the isolation of M. *fortuitum*, an oral regimen of clarithromycin (1500 mg/day) and ciprofloxacin 1500 mg/day was administered. After 8 weeks of therapy, the individual abscess pockets were completely emptied with minimal discharge.

We report a case of soft tissue infection by M. *fortuitum* in a 52-year-old female after receiving 2 sessions of nerve block at the previous zoster sites. Contamination of the injected substance most likely caused such lesions.

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