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Case report

Rhinosinusitis and disseminated cutaneous infection caused by *Mycobacterium chelonae* in an immunocompromised patient

Yasunori Enomoto [a, e, *], Misao Oba [b], Norihisa Ishii [c], Kazue Nakanaga [c], Yuki Yagi [d], Hirotsugu Hasegawa [a], Yuichi Ozawa [a], Takashi Matsui [a], Koshi Yokomura [a], Takafumi Suda [e]

[a] Department of Respiratory Medicine, Respiratory Disease Center, Seirei Mikatahara General Hospital, Japan
[b] Department of Dermatology, Seirei Mikatahara General Hospital, Japan
[c] Leprosy Research Center, National Institute of Infectious Diseases, Japan
[d] Department of Otorhinolaryngology, Seirei Mikatahara General Hospital, Japan
[e] Second Department of Internal Medicine, Hamamatsu University School of Medicine, Japan

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ABSTRACT

Mycobacterium chelonae frequently involves the skin, and the disseminated form can be observed in immunocompromised patients. In contrast, rhinosinusitis caused by the bacterium is a rare manifestation, which occurs independently of immune status. We report here a rare case of *M. chelonae* infection presenting as both disseminated cutaneous infection and rhinosinusitis in an immunocompromised patient. He had received systemic corticosteroids for 11 months due to cryptogenic organizing pneumonia. Before admission, he sustained injuries to his left arm and hand; those injuries succumbed to an infection that would subsequently spread to his other limbs, face, and even nasal cavities. This valuable case suggests that disseminated cutaneous infection by *M. chelonae* could spread to other organs.

1. Introduction

Cutaneous infections by nontuberculous mycobacteria (NTM) have been increasingly reported, particularly by *Mycobacterium marinum* and rapidly growing mycobacteria; e.g., *Mycobacterium chelonae*, *Mycobacterium fortuitum*, and *Mycobacterium abscessus* [1]. Infections caused by *M. chelonae* commonly involve the skin, eye, bone, and soft tissue. With skin involvement, a disseminated form is frequently observed in immunocompromised patients [2,3]. Several authors have reported other atypical presentations of *M. chelonae* infection, including lung infection [4], thyroid abscess [5], meningitis [6], and endocarditis [7]. Rhinosinusitis caused by *M. chelonae* is also uncommon, but has been observed in both immunocompetent and immunocompromised patients [8–12]. We report here a rare case of *M. chelonae* infection presenting as both disseminated cutaneous infection and rhinosinusitis in an immunocompromised patient.

2. Case report

An 86-year-old Japanese male was admitted to our hospital with complaints of general fatigue and appetite loss persisting for 2 months. He had been diagnosed with cryptogenic organizing pneumonia 11 months ago, and had received long-term treatment with systemic corticosteroids. The lung disease was controlled by oral predonisolone (PSL) at adjusted doses of 5–30 mg/day. He had also suffered from chronic heart failure with mitral and tricuspid moderate regurgitation, chronic atrial fibrillation, and chronic kidney disease. Warfarin, furosemide, and spironolactone had been administered for the diseases. There were no other past medical histories including cutaneous and nasal/paranasal diseases. He had some difficulties in walking and eating by himself and lived in a nursing care home. One month ago, he fell over and sustained injuries to his left arm and hand. These injuries had been treated with

* Corresponding author. Department of Respiratory Medicine, Respiratory Disease Center, Seirei Mikatahara General Hospital, 3453 Mikatahara-cho, Kita-ku, Hamamatsu City 433-8558, Japan. Tel.: +81 53 436 1251; fax: +81 53 438 2971.,
E-mail addresses: yasuyasuyasu29@yahoo.co.jp, enomotoy@hama-med.ac.jp (Y. Enomoto).

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white petroleum jelly and had partially crusted, but not fully healed; they had become itchy and painful, and had gradually spread to his other limbs and face. Those abnormalities had not been found by the nurses in the nursing care home before the episode of injury. His general condition as well as the skin disease gradually deteriorated, and consequently, he became bedridden.

On admission, he was afebrile; blood pressure was 104/60 mm Hg, pulse was 90/min, and peripheral artery oxygen saturation was 98% on room air. His height and body weight were 157 cm and 45 kg respectively. Although his vital signs were stable, he appeared to be in poor health generally. The dosage of PSL was at 20 mg/day. Physical examination showed multiple ulcerated nodules with crusts on his face, subcutaneous nodules on his left elbow, and skin ulceration on his right leg and bilateral hands. Skin ulceration was severe, particularly on the dorsal parts of his fingers bilaterally (Fig. 1). Both nasal cavities were partially covered by crusts. After removing these, endoscopic intranasal evaluation revealed ulcerative mucosa, particularly in the nasal septum and middle nasal concha. White blood cell count was 6290/μL, hemoglobin was 13.9 g/dL, and platelet count was 41×10^4/μL. Although liver function tests were within normal ranges, serum creatinine and urea nitrogen were elevated (2.5 mg/dL and 77 mg/dL, respectively). C-reactive protein was also elevated (11.4 mg/dL). Anti-HIV antibody was negative. For infectious disease workup, blood, a respiratory tract specimen (collected by nasal suction), and pus from the skin eruptions on the limbs and face were extracted for cultivation. The smears of all samples except blood showed positive acid-fast bacillus on Ziehl-Neelsen staining. The DNA of *Mycobacterium tuberculosis* and *Mycobacterium avium* complex was not detected by PCR analysis in any of the samples. Chest CT revealed no abnormal findings, including consolidation and micronodules, suggesting the relapse of cryptogenic organizing pneumonia or pulmonary nontuberculous mycobacterial infection. Instead, sinus CT suggested mild sinusitis (Fig. 2). Bony involvement was also observed.

We performed multiple biopsies of the skin eruptions on the limbs and face, middle nasal meatus, and middle nasal concha. All of the biopsy slides typically showed moderate-to-severe inflammatory cell infiltration without evidence of granuloma formation, presenting with positive acid-fast bacillus (Fig. 3). We diagnosed a combined case of disseminated cutaneous infection and rhinosinusitis caused by NTM, and subsequently initiated empiric chemotherapy with a combination of clarithromycin (CAM) 400 mg/day, levofloxacin (LVFX) 250 mg/every other day, and rifampicin (RFP) 450 mg/day. The dosage of LVFX was adjusted on the basis of the patient's renal function. Although the skin eruptions showed some improvement after a week, the patient's general condition gradually worsened. He died suddenly, 12 days after initiating anti-mycobacterial treatment. We could not obtain consent to perform an autopsy. DNA–DNA hybridization identified the cultured mycobacteria as *M. chelonae*, which was consistent with the results of sequence analysis concerning 16S rRNA and *rpoB* [13]. The minimum inhibitory concentrations for CAM, LVFX, and RFP were 1.0 μg/mL, 16.0 μg/mL, and 32.0 μg/mL, respectively.

3. Discussion

M. chelonae infection frequently involves the skin, eye, bone, and soft tissue, deriving from inoculation with the bacterium. Cutaneous infection by *M. chelonae* has been widely reported in the

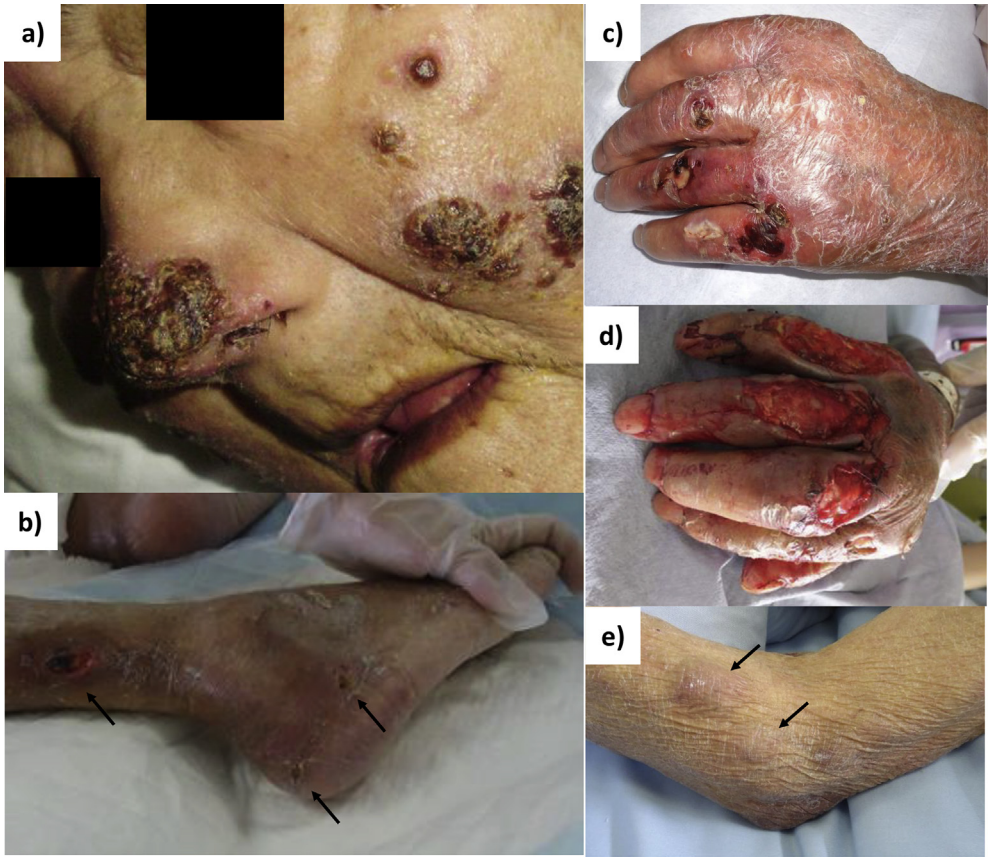

Fig. 1. Disseminated skin eruptions. Ulcerated nodules with crusts on the face (a). Skin ulceration on the right leg (arrows) (b), fingers of the left hand (c), and fingers of the right hand (d). Subcutaneous nodules on the left elbow (arrows) (e). These lesions underwent skin biopsies and culture examination.