

## SHORT COMMUNICATION

Bilateral Sporotrichoid Cutaneous Infection by *Mycobacterium haemophilum* in a Chinese Patient with Systemic Lupus ErythematosusWei Gao, Hao Chen<sup>#</sup>, Hongsheng Wang<sup>#</sup>, Haiqin Jiang, Weijun Liu, Danfeng Hao and Meiyu Tang

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Accepted Feb 16, 2015; Epub ahead of print Feb 24, 2015

*Mycobacterium haemophilum*, a type of slow-growing, fastidious, and iron-requiring microorganism which often infects immunocompromised individuals was first reported as a novel pathogen in 1978 (1).

## CASE REPORT

We report a case of an immunocompromised 30-year-old woman with systemic lupus erythematosus (SLE) with bilateral sporotrichoid cutaneous infection caused by *M. haemophilum*. The patient initially presented with painful deep erythematous nodules and ulcerations on her left forearms for several months. These nodular lesions were arranged along the lymphatic path and became suppurative, ulcerative, and crusted. Subsequently, the symmetrical part of the dorsum of the patient's right hand showed a similar nodular lesion (Fig. 1A–C). Eight years earlier, she was diagnosed with SLE and intermittently treated with steroid therapy (dosage was unknown), however, the facial rash still relapsed. Currently, the patient is receiving 20 mg prednisone once daily. Her medical history revealed no other systemic diseases and she denied any preceding history of trauma, gardening, or dealing with fish tanks. Laboratory examination showed the platelets were  $23 \times 10^9/l$  (normal:  $100\text{--}300 \times 10^9/l$ ) and the hemoglobin

was 105 g/l (normal: 110–150 g/l). Urine routine examination showed proteinuria and occult blood. Immunological findings included positive results for ANA (1:1,000), anti-RNP, and anti-SSA. The purified protein derivative (PPD) test and human immunodeficiency virus (HIV) antibody test were negative.

Histological examination of an erythematous nodule on the patient's left forearm revealed an abscess and granulomas without caseous necrosis in the superficial and mid-dermis, which involved mainly neutrophils, as well as lymphocytes, histiocytes, plasmocytes, and a small amount of eosinophils (Fig. 1D, E). The epidermis was mildly hyperplastic and Ziehl–Neelsen staining of the histopathology lesions revealed acid-fast bacilli (AFB) (Fig. 1F). Other specific stains, such as periodic acid Schiff and Giemsa stains, for microorganisms were negative.

Biopsy specimen culture for mycobacteria on a Löwenstein–Jensen medium was negative. Therefore, a direct sequencing protocol targeting *hsp 65* and *16S rRNA* genes of mycobacterium was applied in the tissue specimen. Sequence analysis of *hsp65* genes indicated 100% homology with the *M. haemophilum* strain ATCC 29548, and *16S rRNA* genes showed 99% similarity with *M. haemophilum* strain DSM 44634. Gene sequences were analysed using BLAST V2.0 software available at <http://www.ncbi.nlm.nih.gov/BLAST/>. The organism, when biopsy specimens were cultured for the second time on a blood

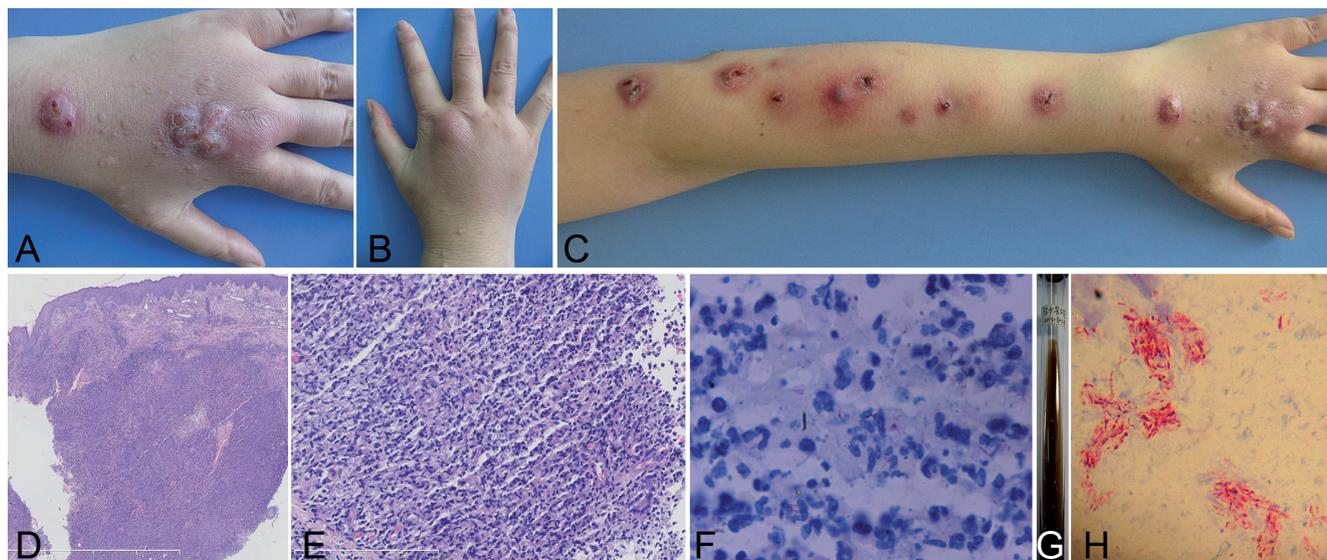


Fig. 1. Clinical manifestations. A) Some redness nodular lesions on the back of the left hand. B) A reddish nodule on the right dorsal hand. C) A chain of redness nodular lesions along the lymphatic path from the back of the left hand to the forearm. Some nodules developed into swelling and ulceration with crusts. D and E) Histologic examination of an erythematous nodule on the left forearm: an abscess and granulomatous under a slight hyperplastic epidermis without caseous necrosis in the superficial and mid-dermis, which involved predominantly neutrophils as well as lymphocytes, histiocytes, plasmocyte, and a small amount of eosinophils. F) Acid-fast bacilli were positive in histopathology by Ziehl-Neelsen staining. G) Culture result: moderate growth of small, smooth, flat, non-pigmented colonies were grown after 3 weeks of incubation (32°C) on a blood agar plate. H) Acid-fast bacilli were positive in the tissue fluid of skin lesion by Ziehl-Neelsen staining.

agar medium, demonstrated moderate growth of small, smooth, flat, and non-pigmented colonies after 3 weeks of incubation at 32°C (Fig. 1G). Ziehl–Neelsen staining confirmed that the cultured organisms were AFB (Fig. 1H), and the gene sequencing of the isolated strain was almost identical to *M. haemophilum*. Fungal and other standard bacterial cultures were negative.

At first, the patient was treated with itraconazole for several weeks without any effect. When positive colonies were found on the blood agar medium, the isolated strain was tested for drug susceptibility. Results showed that the mycobacterium was susceptible to isoniazid, rifampicin, moxifloxacin, and clarithromycin, but resistant to ethambutol. Therefore, an oral regimen consisting of clarithromycin (1,000 mg/day), rifampicin (600 mg/day), and moxifloxacin (400 mg/day) was administered. The patient was treated with 20 mg prednisone once daily for SLE. After two months of therapy, the patient's white blood cells decreased. Until now, she is still being administered with clarithromycin alone. Most lesions have disappeared without any new rash.

## DISCUSSION

*M. haemophilum* is a non-tuberculous mycobacterium (NTM) species that grows on a mycobacterial medium supplemented with ferric ammonium citrate or hemin (2). This microorganism is a rare pathogen causing human infections with only about 100 published cases worldwide (3). Our patient had a long history of SLE. Several cases of patients with SLE and *M. haemophilum* infection have been reported, and published data from 1990 until recent time are shown in Table S1<sup>†</sup> (4–7).

Infection with *M. haemophilum* in immunocompromised patients sometimes includes lymphadenopathy, cutaneous ulceration, arthritis, and osteomyelitis (8, 9). However, the most common clinical manifestations are cutaneous lesions with a preference for cooler body parts, such as the extremities. The development of sporotrichoid nodular lymphangitis caused by *M. haemophilum* infection is exceptional (10) and bilateral sporotrichoid cutaneous lesions, as described here, have only been reported 4 times previously (11).

Typical histological features include numerous well-formed infectious granulomas (12); acid-fast organisms can be detected in the biopsy sections in fewer than 50% of the cases (13). *In vitro* culture of *M. haemophilum* should be performed under certain conditions, with an iron-supplemented medium and growth at 28 and 33°C (1). The appropriate molecular techniques for the identification of stains include PCR, real-time PCR, or hsp65 and 16S rRNA gene sequencing (14, 15).

In conclusion, although the virulence of *M. haemophilum* is low and the disease is only slowly progressive, it can result in tissue damage and complicate the treatment of pre-existing diseases. Newly occurring lesions, such as plaques, nodules, and ulcers in SLE patients, may serve as important clues for NTM infections.

## ACKNOWLEDGEMENTS

This study was supported by grants from the National Natural Science Foundation of China (81371751), the fund for Natural Science Foundation of Jiangsu Province (2014020044) and the fund for Key Clinical Program of the Ministry of Health of China (2012ZD007).

*The authors declare no conflicts of interest.*

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<sup>†</sup><https://doi.org/10.2340/00015555-2076>