

Mycobacterium avium Infection after Acupoint Embedding Therapy

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Summary: Nontuberculous mycobacterium is a ubiquitous environmental organism that is unusual to cause a true infection, but it can cause severe cutaneous infections. In this case report, we present a successful treatment for a Chinese patient with *Mycobacterium avium* cutaneous infection after acupoint embedding therapy. We managed to conduct pathogenic detection, drug sensitive test, and multidisciplinary consultation. Finally, a systematic treatment strategy of nontuberculous mycobacterium was performed. Twenty-two-month follow-up revealed excellent outcome without any recurrence. (*Plast Reconstr Surg Glob Open* 2017;5:e1471; doi: 10.1097/GOX.0000000000001471; Published online 26 September 2017.)

CASE REPORT

Nontuberculous mycobacterium (NTM) is a ubiquitous environmental organism that is progressively recognized as a human pathogen. It is unusual to cause a true infection, but it can be an important cause of severe cutaneous infections, especially in immunocompromised patients and after invasive procedures such as acupuncture or minor surgery.¹

Acupoint embedding therapy (AET), as one of the most common kinds of acupuncture, embeds absorbable foreign substances such as polydioxanone sutures in acupoints to achieve their long-term stimulation.² Recently, AET has been widely used in both Asian and Western countries. However, little is known about the adverse effects of this therapy, especially about the infection of NTM.

In this article, we report a Chinese patient with *Mycobacterium avium* cutaneous infection after AET. The patient was informed that data concerning the case would be submitted for publication.

The 33-year-old Chinese woman presented with redness, swelling, hardening, and a fistula with purulent discharge on the right lower extremity (Fig. 1). The skin lesions had occurred 5 days previously after the AET, and the skin lesions were centered around the embedding points. The patient did not have a fever or lymphadenopathy.

The patient had received routine antibiotics treatment of the beta-lactam antibiotic ceftriaxone (2g/d) for 2

months in another hospital, which proved no significant improvement. At presentation, the fistula with purulent discharge had worsened (Fig. 2). She was transferred to our hospital for further evaluation and treatment.

Ultrasound examination showed subcutaneous free echo fluid collection at the scar area of the right leg measuring up to 0.3 cm in depth. Fluid collection was also seen between the muscle of the right calf measuring 3.0 × 0.3 cm in the area, without flow signal on Color Doppler.

Histological examination of the biopsy obtained from the lesion on the right leg showed suppurative granulomatous inflammation with neutrophilic microabscesses, caseous necrosis, and acid-fast bacilli (Fig. 3).

Gram staining and routine culture were performed repeatedly, which led to negative results. Because infection of mycobacterium was suspected, acid-fast bacillus (AFB) staining test and polymerase chain reaction test were conducted before culture test was conducted for *M. tuberculosis* and nontuberculous mycobacteria. The results of AFB staining were positive, and the isolate was identified as *M. avium*.

Then pathogenic detection and drug sensitivity test were conducted immediately. Meanwhile, we organized a multidisciplinary consultation including plastic, respiratory, and dermatological specialists. Finally, the treatment decision of azithromycin (250 mg/d), amikacin (600 mg/d), moxifloxacin (400 mg/d), and cefoxitin (4 g/d) was made based on retrieval and reviewing information of evidence-based clinical practice guidelines from the literature, especially the treatment and diagnostic guidelines for nontuberculous mycobacteria recommended by the American Thoracic Society and the Infectious Diseases Society of America. Twenty-two-month follow-up revealed excellent outcome with no recurrence and only a small scar deformity (Fig. 4). This patient may have sub-

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Fig. 1. *Mycobacterium avium* infection after acupoint embedding therapy. Redness, swelling, hardening, and a fistula with purulent discharge with a linear distribution on the right lower extremity.



Fig. 2. *Mycobacterium avium* infection after acupoint embedding therapy. The fistula with purulent discharge had worsened when the patient was transferred to our hospital.

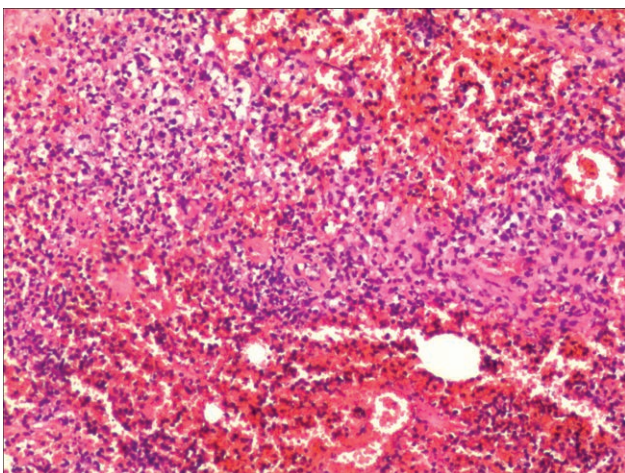


Fig. 3. *Mycobacterium avium* infection after acupoint embedding therapy. Acute suppurative granulomatous inflammation with neutrophilic microabscesses, caseous necrosis, and acid-fast bacilli (hematoxylin-eosin stain).

sequently plastic and aesthetic surgery to treat the scar deformity, but anti-NTM agents are not needed.

DISCUSSION

Along with the increase in the number of people with immunosuppressive states over the past few decades, the incidence of nonmycobacterial infections has increased worldwide in recent years. Also, the occurrence of nonmycobacterial infections is usually related to injections, surgical procedures, or minor trauma. AET is widely performed in Asia, where these kinds of infections are usually epidemic.¹

It is usually difficult to diagnose cutaneous NTM infections because of the variety of clinical manifestations affected patients present with as well as the frequent false-negative culture results they show. It is difficult to confirm *Mycobacterium tuberculosis* complex or NTM infection in the conventional method such as histopathological examination, AFB test, and culture. Microscopic detection of mycobacterium is limited due to low sensitivity. Culture has high sensitivity and specificity but takes a longer time before results are confirmed. Compared with other diagnostic methods, the polymerase chain reaction test method was reported to show the highest sensitivity and accuracy for diagnosis of mycobacterium infection.³

There are reports of NTM infections being contracted after tattooing and acupuncture.^{4,5} However, this is the first report of a localized infection of *M. avium* associated with AET.



Fig. 4. *Mycobacterium avium* infection after acupoint embedding therapy. After 19-month anti-NTM therapy and 22-month follow-up, it turns out to be an excellent outcome with no recurrence and only a small scar deformity.

Unlike other NTM species, *M. avium* would seem to have different response patterns to antibiotic treatment. Thus, clinical practitioners should suspect NTM in patients presenting with abscesses and fistulas with purulent discharge in areas where AET is being treated. Such infections should be treated promptly to minimize further disfigurement.

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REFERENCES

1. Jung MY, Lee JH, Kim CR, et al. Cutaneous *Mycobacterium mageritense* infection of the sole of the feet. *Ann Dermatol.* 2014;26:92–95.
2. Noh TK, Won CH, Lee MW, et al. Infection with *Mycobacterium fortuitum* during acupoint embedding therapy. *J Am Acad Dermatol.* 2014;70:e134–e135.
3. Kim SK, Choi JA, Kim MH, et al. Treatment of the *Mycobacterium chelonae* infection after fat injection. *Arch Plast Surg.* 2015;42:68–72.
4. Kim HS, Park IH, Seo SH, et al. Multifocal infection of *Mycobacterium* other than *tuberculosis* mimicking a soft tissue tumor of the extremity. *Orthopedics.* 2011;34:e952–e955.
5. Mitchell CB, Isenstein A, Burkhart CN, et al. Infection with *Mycobacterium immunogenum* following a tattoo. *J Am Acad Dermatol.* 2011;64:e70–e71.