Mycobacterium Abscessus Skin Infection Following Mesotherapy for Fat Reduction: A Case Report

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ABSTRACT

Mesotherapy is referred to as a minimally invasive technique by using intradermal or subcutaneous injection with liquid containing a mixture of compounds for the treatment of varying medical and cosmetic conditions. Although noninvasive cosmetic procedures gain increasing popularity, mesotherapy remains a controversial treatment according to lack of scientific standpoint, standard formulas, and treatment protocol. In addition, a wide variety of side effects from mesotherapy have been reported.

We reported a case of a 30-year-old Thai male, immunocompetent patient, who underwent mesotherapy for facial fat reduction at a private clinic and developed erythematous nodules on both cheeks 3 weeks after injection. The skin biopsy was then performed and histopathology showed mixed cell granuloma in deep dermis. Tissue culture was positive for *Mycobacterium abscessus*. He received a combination of clarithromycin and ciprofloxacin for six months with very good response. The nodules were healed with atrophic scar and post inflammatory hyperpigmentation without recurrence until eight months follow up.

Keywords: *Mycobacterium abscessus*, non-tuberculous mycobacteria, mesotherapy, injection lipolysis

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CASE REPORT

A 30-year-old Thai male from Bangkok presented with erythematous nodules on both cheeks for 2 months. He had received mesotherapy for fat reduction on both cheeks at a private clinic three months ago, and then two erythematous tender nodules had developed on his cheeks 3 weeks later. Oral antibiotics had been prescribed without any response. The incision and drainage were done and discharge culture for bacteria demonstrated negative result. The oral antibiotic was changed to amoxicillin/clavulanic acid, but even so, there was no improvement. There was no other abnormal systemic symptom.

Physical examination

The skin examination revealed tender erythematous dermal to subcutaneous nodules, size 2-3 cm. in diameters on both cheeks (Fig 1A). There was no cervical lymphadenopathy. Other systems were normal.

Investigations

Skin biopsy was done and tissue was sent for microbiological studies. The histopathology showed necrotic tissue and mixed cell granulomas

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with area of fibrosis in deep dermis (Fig 2). Foreign body and organism were not identified and the special stains for mycobacteria and fungus were negative. Gram stain and bacterial culture were negative. Fungal culture was also negative. AFB stain and PCR for TB were negative, but culture for mycobacteria was positive for *Mycobacterium abscessus*. The antibiotics susceptibility test showed the organism was susceptible to amikacin and clarithromycin, but resistant to ciprofloxacin, doxycycline and moxifloxacin.

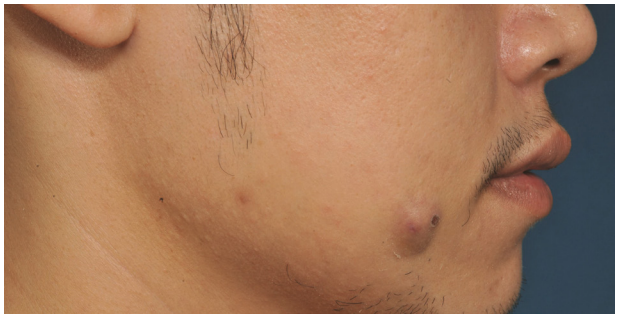

Fig 1A. Erythematous dermal to subcutaneous nodule, size 2-3 cm. in diameters on right cheek.

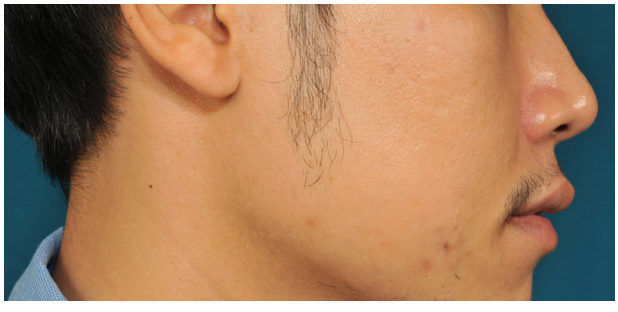

Fig 1B. The nodule was healed with atrophic scar and post inflammatory hyperpigmentation at 3 months follow-up after treatment.

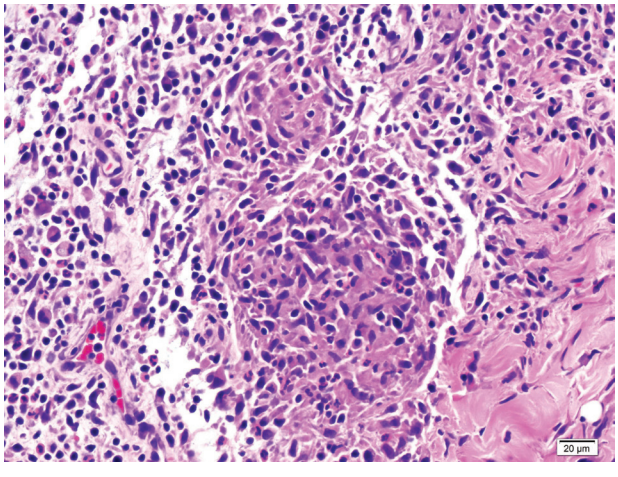

Fig 2. Histopathology showed mixed cell granulomas with area of fibrosis in deep dermis. (H&E, original magnification x40)

Treatment and follow up

He received clarithromycin 1,000 mg/day and ciprofloxacin 1,000 mg/day with very good response (Fig 1B). The treatment had been started before the result of susceptibility test was obtained, so we continued the same antibiotics for totally six months. The nodules were healed with atrophic scar and post inflammatory hyperpigmentation without recurrence until eight months follow up after treatment cessation.

DISCUSSION

Mesotherapy was firstly prescribed in 1952 by Dr. Michel Pistor, who found that intravenous injection of procaine can improve hearing in asthmatic patients.[1] Later, he coined the term mesotherapy or treatment of mesoderm because he believed that local injection could provide the specific effects on the tissue derived from mesoderm. Nowadays, the term "mesotherapy" is referred to as a minimally invasive technique by using intradermal or subcutaneous injection with liquid containing mixture of compounds for the treatment of varying medical and cosmetic conditions.[2,3]

Mesotherapy is used to treat multiple medical conditions such as pain, sports injuries, allergy, chronic fatigue, hearing loss, depression, insomnia, tinnitus, vertigo, peripheral vascular disease. It can also be used for cosmetic purposes such as hair growth stimulation, skin rejuvenation, and subcutaneous fat or cellulite reduction.[2,3] The major ingredients used for subcutaneous fat reduction include methylxanthines (aminophylline, theophylline, and caffeine), isoproterenol, epinephrine, calcium pyruvate, carnitine, Ma huang, T3/T4 triiodothyroacetic acid (tiratricol) and more commonly, phosphatidylcholine and deoxycholate. However, there is still no standard treatment protocol and practitioners generally mix ingredients adjusting for aparticular patient. For example, common formulations for cellulite

treatment usually consists of pentoxiphylline; hyaluronidase or collagenase; carnitine; calcium pyruvate; aminophylline or caffeine; coumarin, artichoke, melilotus or ginko biloba.[2] Since there is no standard formula for mesotherapy, the scientific data about the efficacy and treatment protocol cannot be established.

Although mesotherapy has gained increasing popularity and acceptance in many countries, especially in Europe, the safety of mesotherapy for subcutaneous fat reduction has not been well documented. Both local and systemic side effects have been reported. Some systemic adverse events were psychosis, ischemic colitis, thyrotoxicosis (from triiodothyroacetic acid), and nephropathy (from Chinese herb). The more common local effects included infection, bruising, edema, skin necrosis, ulcer, scaring, panniculitis, nodularity, irregularity, and cutaneous reaction such as urticaria, granuloma and lichenoid eruption.[3,4] Moreover, there has been some concerns regarding drug interaction between some ingredients in the same formula.[5]

The most common side effect of mesotherapy was non-tuberculous mycobacterial (NTM) infection.[4] Several outbreaks of NTM after mesotherapy were reported in Columbia, Peru, Untied States, France and Spain. *Mycobacterium chelonae, M.fortuitum* and *M.abscessus* were the most common organisms found in culture.[6] In Thailand, there was one case report of *M.abscessus* after mesotherapy[7] similar to our patient, although no outbreak has been reported in Thailand. However, a large retrospective study from our institute from 1994 to 2000 also demonstrated *M.fortuitum* followed by *M.marinum* and *M.chelonae* respectively, as the most common pathogens in overall population.[8]

In general, NTM is usually found in nature such as soil, dust, water and hospital environment. NTM infections from cosmetic procedures can be caused from contaminated injection or under-standardized sterile technique. Clinical manifestations are varied from abscess, nodule, hyperkeratotic plaque or ulcer. Establishing diagnosis of NTM infection is often difficult according to lack of characteristic clinical findings, overgrowth of skin contaminants from aspiration or swab culture, and low yield of AFB stain. The standard laboratory investigation is mycobacterial culture from skin biopsy. PCR can increase diagnostic sensitivity while histopathologic finding with suppurative granuloma can help leading toward NTM infection. Susceptibility testing, if possible, should be performed when causative agent is identified. There is still no consensus guideline of treatment for NTM infection, although combination of antibiotics is recommended to avoid development of resistance. For *M.abscessus*, initial treatment option should be clarithromycin plus amikacin/ cefoxitin or imipenem, and surgical debridement may be beneficial. Duration of treatment is not well documented. However, the recommendation of treatment is for least 6 months and 4-8 weeks continuation after healing may be required.[9] Our patient received clarithromycin and ciprofloxacin for 6 months with good response, although the susceptibility test demonstrated resistance to ciprofloxacin. The role of in vitro susceptibility antimicrobial testing for management of non-tuberculous mycobacteria is still debated because the relationships between the susceptibility tests and clinical responses vary. For *mycobacterium abscessus*, it appears to have a correlation between susceptibility test and treatment response, although there has been no prospective study to confirm this correlation.[10] Therefore, clinical follow up is the most important factor to determine further management. Moreover, both clarithromycin and ciprofloxacin are available in oral form that can be prescribed in OPD setting, while amikacin, cefoxitin and imipenem have intravenous form and require hospital admission.

In conclusion, mesotherapy remains a controversial treatment according to lack of scientific standpoint, standard formulas, and treatment protocol. This treatment modality is not approved by US and Thai FDA. In addition, a wide variety of side effects from mesotherapy has been reported. NTM infection is one of the common complications that should be aware and prompt for proper investigation and treatment.

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