Original Articles

Tinea Faciei by *Microsporum gypseum* Mimicking Allergic Reaction following Cosmetic Tattooing of the Eyebrows

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ABSTRACT

A 63-year-old healthy female patient presented with well defined itchy erythematous lesions on the area of her eyebrows. Her eyebrows had been tattooed two months before her visit to us. The lesions had previously been treated by application of steroid ointment and anti-histamine and steroid tablets by mouth without success. We suspected the lesions to be contact dermatitis caused by some metal element contained in the dye used for tattooing. Treatment was continued for two weeks, but the lesions spread to her cheeks and forehead. No fungal element was found from the lesions by direct microscopy at this stage. The patch-testing to 20 metal substances on her skin showed no allergic reaction. After one more week of treatment, we reexamined the scale taken from the lesions by direct microscopy, and fungal elements were found at that time. *Microsporum (M.) gypseum* was isolated from the scale taken from the lesions. The lesions cleared after treatment of 11 weeks' oral intake of itraconazole 100 mg daily.

It was found that the patient was accustomed to sleep with her dog, a Chihuahua. On examination by a veterinarian, no skin lesions were found on the dog. We speculate that the paws of the dog might have carried soil contaminated by *M. gypseum*, a geophilic fungus, to the area of her eyebrows which had minor trauma after being tattooed.

Key words : tinea faciei, *Microsporum gypseum*, cosmetic tattooing, pet-keeping, dog

CASE REPORT

A 63-year-old healthy female patient had her eyebrows tattooed for cosmetic reasons two months before her visit to us. Itchy erythematous lesions developed around the eyebrows one month after the tattooing. She consulted a local dermatologist, and was prescribed steroid ointment, oral anti-histamine and betamethasone 5 mg/day. The lesions did not respond to one week's treatment. Metal allergy was suspected and the patient was referred to our dermatology department. On examination, well-defined itchy patches of erythema on the eyebrows were seen (Fig.1

[Day 1]). Contact dermatitis caused by tattoo dye was suspected, and patch-testing to metal substances was arranged. We continued the treatment.

When the patient was examined on day 20, the lesions had spread to her cheeks and forehead. We suspected tinea faciei, but no fungal element was found by microscopy in the scale taken from the lesion at this stage (Fig. 2a [Day 20]). No other lesion caused by superficial mycosis such as tinea pedis and tinea corporis was found elsewhere on the skin.

On day 26, fungal elements were found by direct microscopy in the scale taken from the lesion at a dermatology clinic. Topical application of luliconazole

Fig. 1. [Day 1] Clinical feature at first visit to us. Well-defined itchy patch of erythema on both eyebrows. Her eyebrows were tattooed two months before her visit.

(a)

(b)

Fig. 2.

- (a) [Day 20] After a total of 4-weeks of steroid ointment application and oral anti-histamine & betamethasone. The erythema had spread to both cheeks & forehead.
- (b) [Day 28] 2 days after luliconazole cream application & itraconazole 50 mg/day orally. The [surface of the erythema developed some rough scale.]

Fig. 3. [Day 110] The lesion cleared following 11-weeks of itraconazole 100 mg/day orally.

zole cream and systemic itraconazole 50 mg/day orally were started.

On day 28, two days after starting anti-fungal treatment, the redness and the scale on the lesions increased (Fig.2b [Day 28]). The topical agent was changed from luliconazole cream to white petrolatum, and the dose of itraconazole was increased from 50 mg/day to 100 mg/day.

On day 110, after 11-weeks of itraconazole at 100

mg/day orally, the lesions had cleared (Fig.3 [Day 110]). Incidentally, patch-testing to 20 metal substances had shown no allergic reaction.

It was discovered on further examination during the treatment that the patient allowed her dog, a chihuahua, to sleep in her bed. No skin lesions were found on the dog on examination by a veterinarian.

MYCOLOGICAL FINDINGS

Culture of the scale taken from the lesion showed powdery to granular white colonies on SDA at 25 degrees Celsius after one week. Slide culture findings showed spindle-shaped, three to six-celled macroconidia with round ends, and some spiral bodies (Fig.4). We therefore identified the causative organism as *M. gypseum*.

Specimens taken from the dog's skin by the hairbrush method showed no fungal element.

DISCUSSION

Lesions on the face are taxing for patients, and they usually seek medical help soon after their onset. It was thus not unusual that the lesions had been treated previously. Differential diagnoses for a facial rash include contact dermatitis,

Fig. 4.

- (a) Culture findings: Powdery to granular white colonies on SDA (at 25°C, 1 week). Viewed from the under side of the plate, the colony is pale yellow.
- (b) Slide culture findings: spindle-shaped, 3-6 celled macroconidia with round ends.

seborrheic dermatitis and atopic dermatitis - to mention a few. *Tinea faciei* is relatively rare compared to these conditions. Our patient had already started steroid treatment topically and orally before she came to see us. She presented with well-defined patches of erythema around the eyebrows with a little scale on their surface and no central clearing. The presentation was atypical as tinea, and misled us to a wrong diagnosis.

The way our patient developed the infection was quite complicated. We discovered through detailed interviews during the course of the treatment that she regularly walked with her dog and allowed her dog to sleep by her side. We speculate that the dog's paws might have carried soil contaminated by *M. gypseum*, a geophilic fungus. The organisms were transferred to the eyebrow area which had suffered minor trauma by being tattooed, and the fungi entered the horny layer via the trauma. *M. gypseum* is primarily geophilic, but the fungi can be transmitted to humans directly from the soil. Already infected animals or carriers of the organisms, especially dogs, are believed to be able to give them to humans by direct skin contact or scratching. It can be therapeutic to keep animals as pets, but they should not be allowed to sleep in bed with humans. Some animals' organisms cause zoonotic infections and they can have serious consequences to humans, even when they are not a danger to the animals themselves.

M. gypseum is one of the best known types of geophilic dermatophytes, and is found all over the world. According to epidemiological surveys carried out by the Japanese Society for Medical Mycology, *M. gypseum* causes 0.1 to 0.2 % of the total cases of dermatophytosis in Japan¹⁻⁵. Tinea caused by *M. gypseum* can be found in children and females, and on sun-exposed areas of the skin⁶.

The lesions caused by *M. gypseum* often have strong inflammatory reactions mimicking dermatitis. As a result, steroid ointment is often applied to the lesions incorrectly. Inflammation is then reduced, and the lesions may present an atypical appearance as tinea.

In the case under discussion, topical application of luliconazole cream made the skin lesions worse. The mechanism may have included irritation caused by the topical application of the anti-fungal cream. Systemic anti-fungal treatment without topical application of anti-fungal ointment is recommended in such cases.

One of the reasons there was a delay before we reached the correct diagnosis was that the patient had had her eyebrows tattooed one month before she developed the rash around the area being tattooed.

There are various ways of tattooing, some temporary and some permanent. Cosmetic tattoo of the eyebrows is a permanent tattoo, and is done by depositing dye in the dermis. Complica-

tions after permanent tattooing include primary irritation, allergic, lichenoid, pseudolymphomatous or granulomatous reactions, and infections^{7,8)}. Disinfectants and ointments applied to the area prior to tattooing may cause contact dermatitis. Metals contained in the dye can cause allergic reactions. Both systemic and local infections have been reported. Systemic infections include sepsis following local bacterial infection. Severe systemic infections such as hepatitis B, hepatitis C and HIV infection can be transmitted by tattooing. Cases of *Mycobacterium* infection and syphilis have been reported in the literature. Local infection of the area being tattooed includes bacterial and herpes simplex infection. No case of fungal infection of the area being tattooed was found in the literature. A single case of *Candida* endophthalmitis after tattooing was found, but the tattoo of that case was on the arm of the patient⁹⁾.

In our case, the onset of the rash was one month after the patient had been tattooed. Primary irritation was most unlikely as the cause of the lesions, and we strongly suspected that they developed as an allergic reaction to some metals believed to be contained in the dye.

CONCLUSION

1) Tinea faciei often gives an atypical presentation with moderate to severe inflammation, and without enlarged raised red rings or central clearing. A single negative direct microscopy of fungal elements does not necessarily exclude tinea. The importance of repeating direct microscopy of the scale taken from the lesions on the face should be stressed, even when the lesions appear to be atypical of tinea.

2) With regard to the treatment of tinea, topical application of anti-fungal cream may irritate the area, and make the lesions worse. Systemic anti-fungal treatment without topical application of the cream should be considered from the beginning of treatment, especially when the lesion presents with marked inflammation.

3) Education about the risks involved in cosmetic tattooing and pet-keeping should be made readily available, and should be given actively to the public, bearing in mind that our lifestyles are rapidly changing.

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