

Topical Steroid Induce Demodicidosis as a Presentation of Hemifacial Rosacea-Like Lesion

- A Case Report

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Demodex mites share a commensal relationship with humans, and they asymptotically parasitize the pilosebaceous follicles of humans. In healthy skin, the density of the mites is normally low, and this low density does not cause skin diseases. When the density of these mites increases, they induce facial skin diseases. We describe a 27-year-old male who presented in our outpatient department with a 10-year history of red and itchy skin lesions on the right side of his face. Determination of the density of *Demodex folliculorum* on the right cheek by standardized skin surface biopsy (SSSB) revealed a density of 20 *Demodex/cm*.² On the contrary, the left face revealed a density of 2 *Demodex/cm*.² The density of *D. folliculorum* declined after treatment with oral metronidazole. The redness of the right cheek improved. Herein, we will introduce the method of modified SSSB, which will be more suitable and useful for Taiwan dermatologists in their daily practice. (*Dermatol Sinica* 27: 111-116, 2009)

Key words: Demodex mites, Skin surface biopsy, Demodicidosis

INTRODUCTION

Demodex is a transparent organism that parasitizes normal skin. Only 2 species-*Demodex folliculorum* and *Demodex brevis*-are known to be pathogenic to humans when their density is increased. *D. folliculorum*, which is an elongated form with $280\pm 52\mu$ in length, is usually found in the follicular infundibulum. *D. brevis*, which is a short form with $166\pm 19\mu$ in length, inhabits the sebaceous and meibomian glands.¹ Both of them utilize sebum as nourishment. The most recent studies have shown that the actual prev-

alence rate of *Demodex* is probably 100%.² In the healthy adult population, the density of this mite is normally low. However, multiplication of the mites in acute and chronic demodicidosis may result in the occurrence of a suppurative granulomatous reaction and inflammation.

CASE REPORT

A 27-year-old male patient who had right facial erythema for more than 10 years was referred to our dermatology department. On tracing back his history, we found that he

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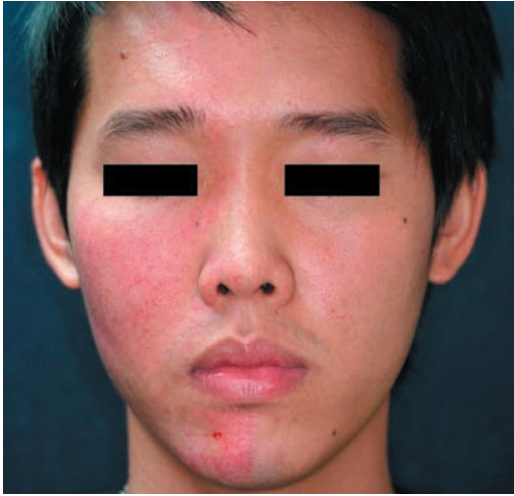


Fig. 1

Well-demarcated erythematous papuloplaques with a sharp margin on the right face.

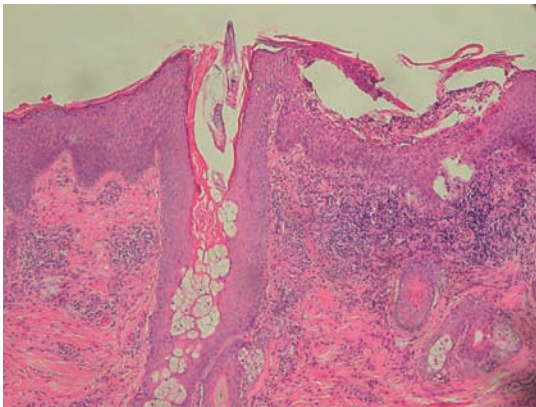


Fig. 2

Histopathological examination demonstrated that two *Demodex folliculorum* mites occupied one follicular infundibulum and dense inflammatory cells infiltrated around the perivascular and perifollicular layers in the dermis. (H&E, original magnification, x40)

had local erythematous plaques on the right side of his face since childhood. He had been diagnosed with facial eczema and undergone application of an unknown topical steroid on the right side of his face for one year. Due to the poor response to this treatment and the hemifacial erythema progressed; he was referred to our department for further evaluation. Physical examination revealed a well-demarcated erythema with a sharp margin,



Fig. 3

A standardized skin surface biopsy revealed the presence of 4 mites (one asterisk indicates 1 mite). Three mites grouped in the same pilosebaceous follicle can be observed here. (Original magnification, x100)

diffuse red papuloplaques, telangiectasia, satellite pustules, and tiny follicular scales on the right side of his face (Fig. 1). He complained of an occasional burning and itching sensation. A biopsy obtained from the right cheek demonstrated the presence of some *D. folliculorum* in one follicular infundibulum and heavy perivascular, perifollicular mononuclear cell infiltrates in the dermis (Fig. 2). A standardized skin surface biopsy (SSSB) taken from the right chin revealed a density of 20 *Demodex/cm*² (Fig. 3). On the contrary, SSSB from the left chin only revealed two *Demodex/cm*². He applied an antiparasitic agent, crotamiton 10%, twice a day for 4 months, but SSSB from the right face still revealed a density of >5 *Demodex/cm*². Then, we switched to systemic monotherapy with oral administration of 250 mg metronidazole 3 times a day for 1 month.³ Follow-up SSSB for the right chin revealed a density of 4 *Demodex/cm*². Recovery was achieved and residual telangiectasia was noted (Fig. 4).

DISCUSSION

Demodicidosis is a rare infection of the human skin, especially in the facial area, and has been classified into pityriasis folliculorum, rosacea-like demodicidosis, and so-



Fig. 4

(A) A close-up view revealed erythema with pustules, follicular plugs and scales, and a “sandpaper-like” appearance of the skin on the right cheek before treatment.

(B) After 1 month of treatment with 250 mg metronidazole orally administered 3 times a day, only some residual telangiectasia and erythema were noted.

called demodicidosis gravis.⁴ Pityriasis folliculorum mainly affects women. Pityriasis folliculorum clinically presents as diffuse but slight facial erythema with follicular plugs and scales that impart a “nutmeg-grater” , “sandpaper-like” appearance to the face. Patients always complain of an itching and burning sensation. In the case of these patients with a history of infrequent cleansing of the face and application of heavy creams and make-up, the diagnosis can be further confirmed. Rosacea-like demodicidosis is manifested by the presence of erythema, scaling, and papulopustules on the skin, and it clinically mimics the appearance of common

rosacea. Sudden onset, rapid progress, and no history of flushing, along with persistent erythema, asymmetric distribution, and involvement of the eyelids can help us establish the diagnosis of rosacea-like demodicidosis. The clinical features of demodicidosis gravis are similar to those of granulomatous rosacea. The histopathology of demodicidosis gravis demonstrates the presence of dermal granulomas showing central necrosis and containing mite remnants phagocytosed by foreign-body giant cells.

Topical steroids have been used in many skin diseases for their anti-inflammatory and immunosuppressive activity. However, they may cause many side effects such as epidermal atrophic changes, telangiectasias, purpura, papulopustular eruptions, hypertrichosis, and microbial superinfections in long-term use.⁵ Our patient had applied an unknown topical steroid on his right face for 1 year because of his right facial eczema. The iatrogenic adverse effects of this steroid were noted after its prolonged application. In 2005, Dolenc *et al.* found a positive correlation between mite density and the duration of treatment with topical steroids in perioral dermatitis.⁶ A long-term treatment significantly increased the odds for an excessive *D. folliculorum* density. The author suggested that the immunosuppressive action of topical steroids will increase the density of the mite. Immunological status is probably the most important factor in the defense of human skin against arthropods.

SSSB was first described in 1971 by Marks *et al.*⁷ The method involves collecting the superficial part of the horny layer and the contents of the pilosebaceous follicles. It is an accurate, noninvasive method that can be reproduced to measure the density of *D. folliculorum*. The normal density of *D. folliculorum* is ≤ 5 Demodex/cm². We modified this technique to make it more suitable for Taiwanese dermatologists in daily practice.



Fig. 5

Standardized skin surface biopsy. Place a drop of cyanoacrylate glue in the centre of the red circle and apply the adhesive-bearing surface of the slide on to the skin for 90 seconds.



Fig. 6

Demodex folliculorum in a SSSB: At least of 7 mites with clearly distinguishable anatomical characteristics were observed in a single follicle in a demodicidosis patient. (Original magnification, x100)

The stepwise description of the method is as follows.

First, clean the skin and the glass slide with alcohol before performing SSSB. This will improve adherence and standardize the variable intensities of seborrhea, which could affect adherence.⁸ Then, draw a circle 11.5 mm in diameter on a glass slide with a red waterproof pen. This will facilitate the examination of a standard surface area of approximately 1 cm². Place a drop of cyanoacrylate glue (super instant glue, Scotch, 3M) in the

centre of the circle and apply the adhesive-bearing surface of the slide on to the skin. Let it remain for approximately 90 seconds (Fig. 5). According to Marks in 1971, the glue should dry in 60 seconds. However, taking into account the hot and humid weather of Taiwan, we need to wait for 90 seconds to remove the glass easily. Finally, ease the glass away from the skin gently, apply 2 or 3 drops of immersion oil to the specimen, and then cover it with a cover slide. The specimen is examined by light microscopy at $\times 40$ and $\times 100$ magnifications. Each specimen is examined twice within 2 hours of sampling to avoid the possibility of decreasing activities of the mites with time. Only mites clearly identified on the basis of their anatomical characteristics are counted. According to our experience, the highest density of mites was found in a demodicidosis patient: 7 mites were found grouped in the one pilosebaceous follicle (Fig. 6).

SSSB is less expensive but more practical than skin biopsy. SSSB for *Demodex* is similar to the potassium hydroxide (KOH) skin-scraping examination for fungus. It provides an alternative choice for dermatologists in daily practice.

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外用類固醇引起的蠕形蟲病， 以半邊臉的類酒糟為臨床表現 -病例報告

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蠕形蟲是一種人類的共生寄生蟲，不引起皮膚症狀的寄生在人類的毛囊與皮脂腺內，在健康人的皮膚，蠕形蟲的密度低，而少量的蠕形蟲並不會引起皮膚的疾病。當蠕形蟲在臉上的數量增加時，便會造成臉部皮膚的疾病。我們報告一個27歲的男性，最初在門診的皮膚表現為右半側臉部皮膚紅、癢的症狀，已經有10年的病史；標準皮膚表面切片檢查顯示，在右側臉頰的蠕形蟲密度為每平方公分20隻蠕形蟲。相反的，左側臉頰的蠕形蟲密度為每平方公分2隻蠕形蟲。在使用口服metronidazole之後，蠕形蟲密度開始下降，而且右側臉紅的症狀也有改善。在這裡，我們提出一個改良式的標準皮膚表面切片檢查，此方法將會更適用於台灣皮膚科醫師。（中華皮誌：27: 111-116, 2009）