

## Case report:

# Rosacea and Demodex: A Comprehensive Case Study Validated by Dermoscopy

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## Abstract

Human Demodex, a widely known ectoparasitic mite, affects mainly pilosebaceous units of the face and head. Human Demodicosis is a skin disease that develops when the follicles become heavily infested, or when the mites penetrate the dermal tissue. Here we have reported a 38-year-old female, who was presented with persistent erythema of the nasal bridge accompanied by pustules. Dermoscopic examination revealed Demodex tails and Demodex follicular openings both specific features of this entity. Histopathological features of skin biopsy were consistent with rosacea in the context of infection with Demodex folliculorum.

## Introduction

Rosacea is a chronic and relapsing inflammatory skin disorder characterized by a varied clinical presentation, including congestion, flushing, telangiectasia and rhinophyma. It commonly occurs in adults over 30 years of age, with a female preponderance.<sup>1</sup> Dermoscopy has become a popular tool to diagnose and monitor many dermatological diseases. The specific dermoscopic patterns can be used to diagnose rosacea, especially demodicosis. The dermoscopic feature of Demodicosis is specific and it can be diagnosed without a superficial surface biopsy. Demodex mites must be investigated in drug-resistant Rosacea.<sup>2</sup>

There are four main types of Rosacea: erythematotelangiectatic, papulopustular, phymatous, and ocular rosacea. Variants of rosacea may also occur which do not strictly match the morphologic patterns or combinations seen in these subtypes.<sup>1</sup> The exact pathophysiology of rosacea is poorly understood. Inflammation and vascular abnormalities are two main factors.<sup>3</sup> Vascular abnormalities result in dilatation of blood vessels with increased capillary permeability and oedema, which in turn provide a favourable setting for the Demodex mites to proliferate and colonize in that area. Demodex mites then stimulate inflammation,

increasing the likelihood of papulopustular or granulomatous lesions.<sup>4</sup>

## Case Report

A 38-year-old Bangladeshi village woman came with the complaints of chronic persistent asymptomatic facial rashes for three years, without any prior triggers. Physical examination revealed fixed erythematous coalescing papules and plaques studded with very few pustules over the nasal bridge and part of Ala Nasi. No ocular involvement was noted. Cheek, chin forehead were unaffected



All baseline laboratory investigations including the purified protein derivative (PPD) skin test, serum anti-nuclear antibody (ANA) and QuantiferonTB gold test were unremarkable. Under dermoscopy

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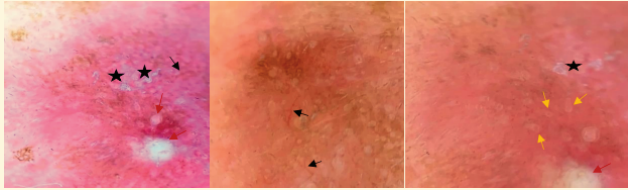
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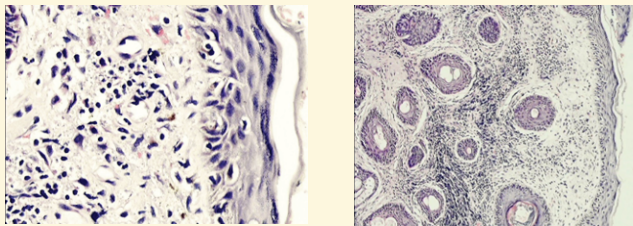
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(Dermlite dl4) we observed non-follicular and perifollicular gelatinous threads or filaments protruding out of follicular openings known as "Demodex tails." They account for the presence of the mite itself. Demodex follicular openings were also identified as dilated follicular openings containing round, brown plugs surrounded by an erythematous halo. They are both specific features of Demodicosis.



Dermoscopic features: Erythematous background, scales (black stars), linear blood vessels (black arrows), follicular pustules (red arrow), follicular plugs and demodex tail (yellow arrows).

A skin biopsy was performed and the histology report was compatible with rosacea.



Histopathological features: Mild exocytosis of the epidermis, dense perifollicular & perivascular infiltration of chronic inflammatory cells in the dermis, dilated capillaries & few dilated follicular infundibula, some of the latter contains demodex.

## Discussion

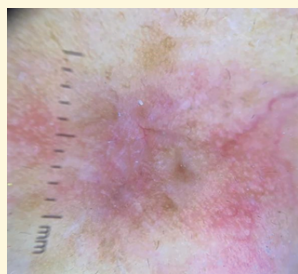
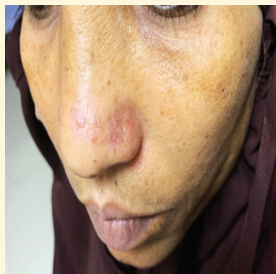
Rosacea is a common chronic skin and ocular condition,<sup>5</sup> characterized by intermittent periods of exacerbation and remission.<sup>6</sup> Reported prevalence rates of rosacea range from 0.09% to 10%.<sup>7</sup> The clinical criteria of rosacea are divided into primary and secondary categories. Primary criteria include transient facial erythema (flushing), no transient erythema, papules, pustules, and telangiectasia. The presence of one or more of these signs with a central facial distribution is considered highly indicative of rosacea. Secondary diagnostic criteria include burning or stinging skin sensations, elevated red plaques without epidermal changes, dry skin appearance, oedema, peripheral location, ocular manifestations, and phymatous changes are often met with one or more of the primary features of rosacea.<sup>1</sup> In this case, a few co-existent clinical criteria

(non-transient erythema, papules, pustules, plaques) were present from both categories.

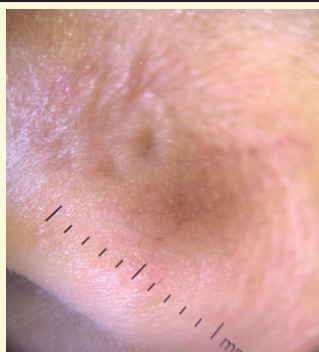
Polygonal vascular structures made up of linear blood vessels are the main findings in Rosacea. The clinical examination is not sufficient to discriminate the polygonal vasculature, whereas papules and pustules are seen clearly with dermoscopy. Follicular plugs, comedones, and dilated follicles are more prominent in the papulopustular subtype of rosacea.<sup>8</sup> In the case of demodicosis, the dermoscopic examination reveals a "Demodex tail" that protrudes from the follicle orifice, which is surrounded by a "Demodex follicle opening" that appears as a grey circle 1–3 mm in length. It is often confused with open comedones, but the open comedones can be seen with the naked eye, and they are more brownish and surrounded by a thin, hyperpigmented ring.<sup>9</sup> Here, we have found the linear vasculature in the form of polygonal networks, follicle plugs and Demodex tails, compatible with histopathological findings.<sup>10</sup>

The diagnosis of Rosacea may be difficult due to the clinical similarities to several skin disease conditions such as acne vulgaris, seborrheic dermatitis, contact dermatitis, and photodermatitis.<sup>6</sup> In this case, other probable differentials were Lupus vulgaris, Sarcoidosis and Tumid Lupus Erythematosus. Here, dermoscopy (Dermlite dl4) was used as a rapid tool for the submacroscopic diagnostic evaluation before we could reach ANA, Qantiferron TB Gold Test and histopathological report.

Various medical options are there to treat Rosacea. Currently, there is no cure for the condition,<sup>11</sup> however, a wide range of medications are used for the treatment of purpose. Topical medications include metronidazole, azelaic acid, benzoyl peroxide, antibiotics, sulfacetamide/sulfur, and retinoids, while oral medications used for this purpose include tetracyclines, metronidazole, isotretinoin, and macrolides.<sup>12</sup> Our patient was treated with oral minocycline 100 mg daily and topical dapsone, retinoid, and sunblock for three months and she remained in remission.



Clinical and dermoscopic changes after two months of therapy. Dermoscopy shows a reduction of background erythema, few linear blood vessels, reduction of scales, no follicular pustules & plugs, and no demodex is seen.



Clinical pictures after three months of therapy show almost complete recovery. Dermoscopy shows mild background erythema, and few linear blood vessels, all other previous dermoscopic findings have subsided.

### Conclusion

The dermoscopic method can be used as a reliable noninvasive, easy and faster method for the diagnosis of rosacea and the accompanying Demodicosis without the requirement of a skin biopsy.

### Conflict of Interest

None

### Funding source

None

### Patient Consent

Taken

### IRB approval status

Not applicable

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