

## Case Report

# Demodex Folliculoris Dermatitis

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### Abstract:

This is a case report of Demodex folliculorum of the forehead, scalp, and face of a 64-year-old male farmer from Sudan presenting with pruritic papular and erythematous skin lesions for 6-months. Demodex infestation of the hair follicles is precipitated by poor self-hygiene and accumulation of excess sebum and skin debris. The treatment entails topical macadamia nuts oil or oral ivermectin in severe cases.

### Introduction

Demodex is a saprophytic mite frequently encountered in skin biopsies from elderly patients. The Latin word literally means (Demo) tallow (Dex) woodworm, describing the analogy of the clinical lesions to a solid animal-derived fat used in soap and wax industries. It is caused by a mite part from the skin normal flora from the genus Demodex folliculorum or Demodex brevis, the former is bigger and usually with a higher density of infestation per hair follicle and affects small hair follicles, while brevis infests also the sebaceous, meibomian glands of the hair and eyelash follicles. The brevis mainly infests the hair follicles of the trunk<sup>1</sup>. The prevalence is higher in male, pet owners and in persons with poor self-hygiene and/or excessive production of sebum and keratin debris especially if working in a humid dusty environment, and inversely associated with the use of facial cosmetics<sup>2</sup>.

Demodex sp. Infestation can present clinically as roseacea, madarosis (loss of eyelashes), blepharitis<sup>3</sup>, pityriasis folliculorum or demodicosis gravis (mimicking clinically severe granulomatous rosacea). The mite feeds on the sebum produced by skin adnexal glands and live as a saprophyte on skin debris. The lifespan of Demodex mites is 14 days for the mite. Dermoscopy reveals characteristic features of follicular plugging and the mite tail<sup>2</sup>. The mite density reported being increased with hemodialysis and phototherapy<sup>4,5</sup>.

### Case report:

This case report highlights the importance of this prevalent frequently ignored condition, albeit with an easy prevention and low-cost remedies.

A 64-year-old farmer from Gezira state in Sudan, presented to the author in Khartoum, with a 6-months history of pruritic, erythematous, papular rash on the face, forehead, and scalp with hypo and hyperpigmented areas. On examination, the lesions were scaly with follicular accentuation and skin roughening (Figure-1). The general condition of the patient was stable. The patient is hypertensive and controlled on amlodipine for 10 years. The occupational history showed constant exposure to direct sunlight with a lot of dirt and sweat.

The patient was not cyanotic, jaundiced, and his blood pressure was 135/85mmHg. Cardiovascular, respiratory, abdominal and neurological examination showed no abnormalities. Ophthalmic examination showed mild cataract of the right eye.

The laboratory investigations showed high random blood sugar= 270mg/dl and the reflective HbA<sub>1c</sub> was 9.2 diagnostic of diabetes, the Complete hemogram showed 4.500 WBC, 11.5 g/dl Hb concentration, normal RBCs indices, and adequate platelet counts.

A small biopsy was taken from the forehead just above the right eyebrow (Figure-1).

The biopsy received fixed in formalin, processed and mounted on a glass slide and stained with hematoxylin and eosin (H&E). Examining the biopsy under scanning power (X4) revealed acanthotic epidermis and overlying basket-weave keratin pattern with widening of the infundibulum of the pilosebaceous units (Figure-2).

A band like infiltrate of inflammatory cells undermined the dermal-epidermal junction and continue to surround descending pilosebaceous units. Melanin incontinence was observed highlighting the pruritic nature of the lesion. The hair shafts were fragmented and multiple mites of Demodex were evident stuffing the hair shaft canal (Figure-3-A&B).

High power examination of the lesion illustrates the histological features of the mite. The following parts were conspicuous: (1) anterior gnathosoma which contains the mouth part, (2) a middle part podosome with four rudimentary legs with two pairs in each side and (3) an opisthosoma rounded tapering cone shaped end (Figure-4). The rendered diagnosis is demodicosis of the forehead, scalp and face.

After two weeks in the follow-up visit the patient conditions was remarkably improved with the usage of macadamia oil and antiseptic (Chloroxylonol) soap. The pruritus disappeared and the coarsened facial areas smoothed up dramatically.

The patient has been referred to an endocrinology clinic for diabetes control.

#### **Discussion:**

There is an association between the geographic locales and the distribution of the subspecies of the Demodex, which signifies the impact of the environmental and ethnic factors in the prevalence of the disease<sup>6</sup>.

Accidental discovery of the Demodex mites is observed in A study from USA in 17/333 scalp biopsies (5.1%) from their archive with step sectioning<sup>4</sup>.

The presence of the Demodex in rosacea of the face and the scalp rendered a long standing debate as it is a culprit or a mere bystander<sup>5</sup>. While the association with seborrheic dermatitis was refuted by some authors<sup>7</sup>. Other reported pattern of inflammation included vesiculopustular<sup>8</sup>. Post-inflammatory hyperpigmented is a frequent sequelae to chronic demodicosis<sup>9</sup>.

Metabolic syndrome<sup>10</sup>, reported to pose increased risk for Demodicosis in a cohort of 263 patients from India. Other study showed significant increased density of the mite in women with gestational diabetes<sup>11</sup> (24% vs 3% in the control group).

The application of contact lenses showed increased density of the mite but without associated increased incidence of ophthalmic conditions<sup>12</sup>.

Phototherapy is associated of facial eruptions, and Demodex should be listed in the differential diagnosis.<sup>13</sup>

Working in dirty a humid and hot condition reportedly increases the risk for Demodicosis, our patient worked as a farmer, another case of Demodex infestation was reported in a coal miner for a five years duration, with complete recovery after oral and topical medication in addition to absenteeism from mining<sup>14</sup>.

Cancer patients have higher rate of harboring the Demodex mites compared to the general population<sup>15</sup>. This can be attributed to the depression of immunity by the debilitating nature of the tumor or the chemotherapeutic agents<sup>16</sup>.

Sebaceous hyperplasia with increased sebum secretion is associated with increased Demodex density and favors infestation<sup>17</sup>.

The differential diagnosis includes scabies which can be excluded by its predilection to extremities and its residency in the superficial stratum corneum, not the glands, also the morphology of the mite discernibly differs from Demodex.

The biopsy technique for a suspected Demodex infestation is through skin scrapping.

The treatment of Demodex infestation is simple with encouraging the use of soap, and household remedies like tea tree oil or macadamia nuts oil topical application. In severe cases, oral ivermectin<sup>18</sup>, metronidazole and/or topical steroids can be prescribed<sup>14</sup>. Ophthalmic lesions are treated with lid hygiene and/or metronidazole gel 1-2 %<sup>19</sup>.

#### **Conclusion:**

Demodex infestation of the pilosebaceous units is common within the elderly, and people working in adverse conditions with low self-hygiene. Health education and optimizing occupational parameters in workplaces, encouraging patients for the frequent use of soap and the treatment of new cases are good measures to control the spreading of cases.

The patient consent has been obtained by the author for the use of the concealed image and data for the purpose of publication.



**Figure-1:** Pruritic papular rash on the face, forehead and scalp with hypo and hyperpigmented roughened areas. The red circle identifies the site of the biopsy.

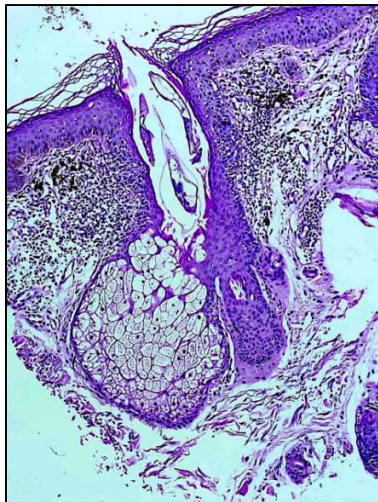
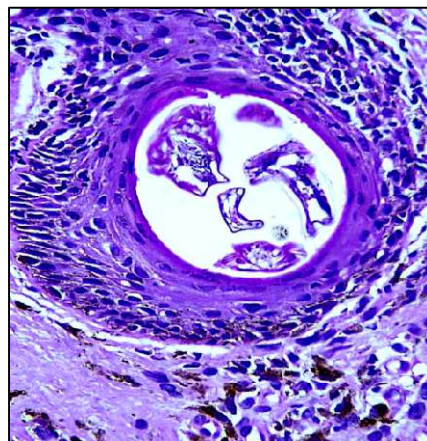


Figure-2: Scanning microscopic power (X4) shows band like inflammatory infiltrate in the dermal-epidermal junction with melanin pigment incontinence that descend to encircle the pilosebaceous unit which is stuffed with three Demodex spp. mites



A



B

Figure-3: A-the photograph shows fragmented hair shaft in the left and a demodex mite in the right. B- multiple Demodex mites in cross section

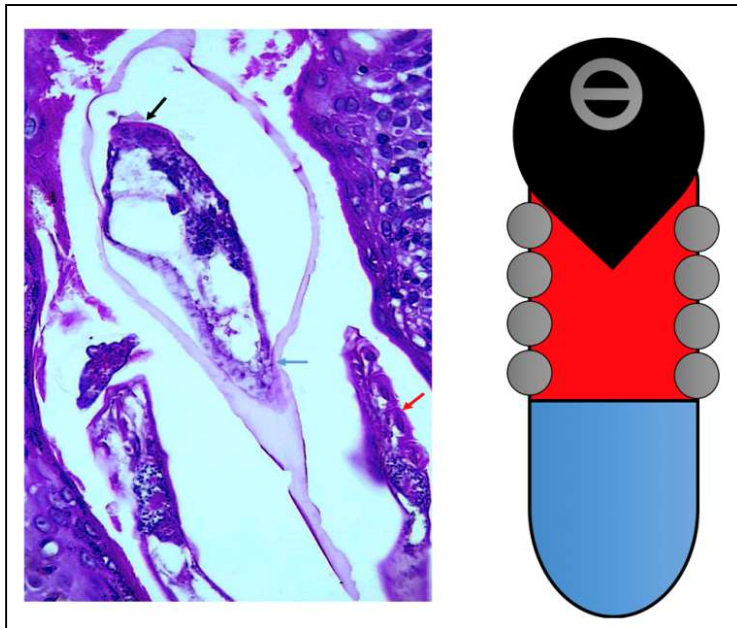


Figure-5: The substructure of the Demodex mite. **Black arrow:** anterior gnathosoma containing the mouth. **Red arrow:** podosome with four rudimentary legs in one side. **Blue arrow:** opisthosoma rounded end. The right diagram represents the substructure with the same color coding.

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