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CASE REPORT PEER REVIEWED | OPEN ACCESS

A rare case of isolated periorbital inflammation due to demodex folliculitis

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ABSTRACT

Introduction: We report an unusual case of demodex folliculitis presenting as isolated bilateral periorbital inflammation without other classical symptoms of demodicosis.

Case Report: A 46-year-old female presented with bilateral eyelid edema without erythema for two years. She denied pain, itching, or rashes. Her ocular exam was unrevealing and without evidence of blepharitis or meibomian gland dysfunction. Inflammatory workup, including thyroid antibodies, was negative. Computed tomography (CT) orbits showed no orbital masses. She was trialed on oral doxycycline therapy with no improvement. Subsequent skin tissue biopsy from upper lid blepharoplasty was consistent with Demodex folliculitis, and the patient's symptoms significantly improved after initiation of terpinen-4-ol (T40) tea tree oil eyelid wipes.

Conclusion: This case suggests that Demodex folliculitis should be included in the differential diagnosis for bilateral periorbital inflammation, even in the absence of the typical signs and symptoms of ocular demodicosis.

Keywords: Blepharitis, Demodex folliculitis, Inflammation

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INTRODUCTION

Demodex folliculorum and *Demodex brevis* are obligate parasites that inhibit the hair follicles and sebaceous units of human skin. It is estimated that 23–100% [1, 2] of the adult population is infested with these mites, usually asymptomatically. Demodex infestation, however, plays an important role in multiple ophthalmological conditions such as blepharitis, blepharoconjunctivitis, blepharokeratitis, meibomian gland dysfunction, and rosacea [3]. The role of Demodex in these disorders is poorly understood; pathogenesis may be related to sebaceous gland dysfunction promoting demodex proliferation [4, 5], Demodex-related blockage of hair follicles and sebaceous units [6], inflammation induced by bacteria harbored within the mite [7], a delayed hypersensitivity immune response to released antigens after the mite's death [8], and/or some form of immune dysregulation [9]. In this study, we report an unusual presentation of isolated periorbital inflammation due to Demodex folliculitis, which has not been described previously to our knowledge. Collection and evaluation of patient health information was Health Insurance Portability and Accountability Act (HIPPA) compliant, and consent was obtained for all patient photographs.

CASE REPORT

A 46-year-old woman with a past medical history of hypertension and syphilis (status post treatment) presented with two years of progressively worsening bilateral periorbital edema. She reported upper and lower eyelid swelling, which was worse in the morning and intermittently affected her lower face. She had eyelid "heaviness" that interfered with her superior vision and affected her daily activities such as reading and driving. She denied eye or eyelid redness, pain, dryness, itching, photophobia, facial flushing, or rash. Extensive review of systems was negative, and there was no edema or rash elsewhere on her body. She had no history of autoimmune diseases or immunocompromised status, did not favor sleeping on one side of her face, practiced good skin hygiene, and denied using new facial makeup products. She did not have any pertinent ocular history or use any ocular medications (including artificial tears or warm compresses) or skin care medications (such as topical antibiotics, etc.).

Functional exam revealed 20/20 vision bilaterally with intraocular pressures of 18 mmHg in both eyes. There was noted edema without significant erythema of the upper and lower eyelids as well as dermatochalasis (Figure 1A). There was no proptosis, and levator function was normal. In addition, there were no collarettes or crusting at the base of the eyelashes, inspissated meibomian glands, keratin plugging, frothing of the tear film, eyelid margin ulceration, telangiectasis, erythema, madarosis, or trichiasis on slit lamp examination. The conjunctiva and sclera were white and quiet. The remaining anterior segment exam and dilated fundus exam were unremarkable. A superior visual field defect, which improved with taping of the eyelids, was observed on Humphrey visual field testing.

Serum laboratory workup, including complete blood count, C-reactive protein, erythrocyte sedimentation rate, thyroid stimulating hormone, rheumatoid factor, anti-nuclear antibody, anti-citrullinated protein antibody, uric acid, antineutrophil cytoplasmic antibody, myeloperoxidase antibody, thyrotropin receptor antibody, thyroid peroxidase antibody, and thyroglobulin antibody were all within normal limits. Computed tomography orbits demonstrated mild periorbital edema bilaterally without any masses (Figure 2). Treatment options were discussed, and the patient opted for conservative management with a trial of oral doxycycline given the possibility of ocular rosacea contributing to her symptoms. The patient reported no improvement with this conservative treatment. She subsequently underwent bilateral upper lid blepharoplasty for her dermatochalasis, and the skin removed during this procedure was sent for biopsy to investigate the etiology of her edema. Histopathological analysis of the skin biopsy revealed Demodex folliculitis as the diagnosis (Figure 3). The patient was then started on tea tree oil eyelid wipes (Cliradex) with significant improvement in her symptoms (Figure 1B) by two months follow up.

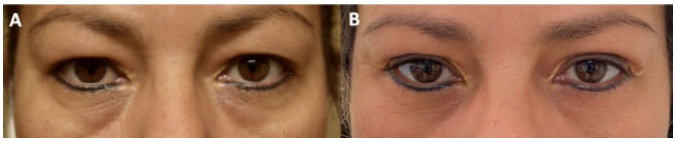

Figure 1: External photograph showing bilateral periorbital edema without other signs of dermatitis (A), which resolved after treatment with tea tree oil (B).

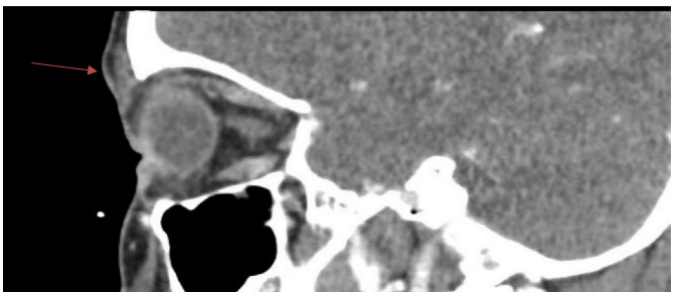
Figure 2: Sagittal CT orbits showed mild bilateral periorbital inflammation on presentation (arrow).

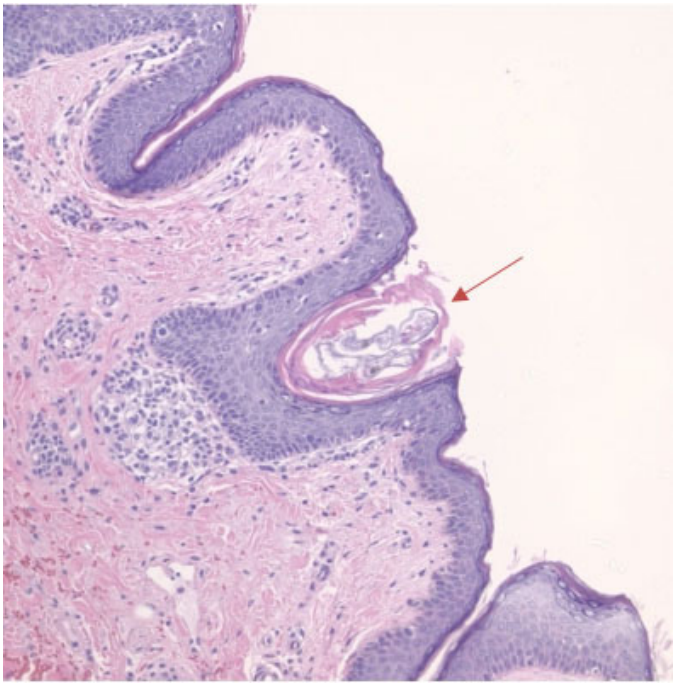
Figure 3: Histopathological analysis of skin tissue samples from upper lid blepharoplasty showed chronic inflammation with dense eosinophilic material surrounding vermiform mites (arrow), consistent with Demodex folliculitis.

DISCUSSION

Demodex infestation is associated with multiple ophthalmic conditions, including blepharitis, blepharoconjunctivitis, blepharokeratitis, meibomian gland dysfunction, and rosacea [3]. Facial Demodex folliculitis classically triggers diffuse erythema with

overlying papules and pustules in the affected area [5]. The pathogenesis remains unclear but may be related to sebaceous gland dysfunction, blockage of hair follicles and sebaceous units, inflammation from bacteria harbored within the mite, or delayed immune hypersensitivity secondary to antigen release after mite death.

Herein, we report an atypical presentation of isolated, bilateral periocular inflammation associated with Demodex mite infestation. It remains unclear why this patient presented without additional signs and symptoms of demodicosis. Several unusual and/or highly variable presentations of Demodex folliculitis have been previously reported, including roughened skin, scales, aciform lesions, perioral dermatitis, facial pruritis without erythema, and papulopustular rashes, but any form of ocular/periocular demodicosis is almost always described in combination with some degree of eyelid margin disease [3, 10, 11]. Most adults are carriers of Demodex, though clinical symptoms are purported to develop only in the context of some internal or external predisposing factor that enables Demodex mite proliferation. The relationship between Demodex infestation and primary or secondary immunosuppression is well established [12–14]. Even subtle immune defects such as hypothyroidism, pregnancy, poor blood glucose control, and advanced age have been reported to promote Demodex proliferation [13, 15]. Intriguingly, however, our patient had none of these risk factors and extensive serum laboratory workup did not reveal any immunocompromised risk factors or disease. The patient's remote history of syphilis was adequately treated well before symptom onset. Possible explanations for the development of her demodicosis may include some genetic or HLA-type predisposition [16, 17], or perhaps her symptoms were an early manifestation of a subclinical immunomodulatory disorder.

Currently, there is no definitive treatment for demodex blepharitis. Treatment options include topical tea tree oil and its active ingredient, terpinen-4-ol. This is thought to cause Demodex mite migration out of the skin as well as promote antimicrobial and anti-inflammatory effects that inhibit Demodex proliferation. Doses ranging from 5% tea tree oil topically twice daily to 50% tea tree oil applied topically once a week have been shown to result in symptom improvement. Side effects after local application are rare. These include eye irritation, eyelid redness, cutaneous eczema, itching, or burning sensation [18]. Additional treatments that have been studied include ivermectin, metronidazole, selenium sulfide, pilocarpine gel microblepharoexfoliation, and lid hygiene [19].

CONCLUSION

While the pathogenesis of demodex-related disease is largely unknown, its corresponding clinical consequences may remain wide-ranging and somewhat unpredictable. This case indicates that it may be worthwhile for ophthalmologists to maintain a high index of suspicion for Demodex in patients with periocular edema even in the absence of blepharitis or meibomian gland disease. Further investigation into the etiology of demodicosis and its risk factors may allow for earlier identification and treatment of patients with demodex folliculitis.

REFERENCES

1. Norn MS. Demodex folliculorum. Incidence, regional distribution, pathogenicity. Dan Med Bull 1971;18(1):14–7.
2. Rufli T, Mumcuoglu Y. The hair follicle mites Demodex folliculorum and Demodex brevis: Biology and medical importance. A review. Dermatologica 1981;162(1):1–11.
3. Luo X, Li J, Chen C, Tseng S, Liang L. Ocular demodicosis as a potential cause of ocular surface inflammation. Cornea 2017;36(Suppl 1):S9–14.
4. Kemal M, Sümer Z, Toker MI, Erdoğan H, Topalkara A, Akbulut M. The prevalence of Demodex folliculorum in blepharitis patients and the normal population. Ophthalmic Epidemiol 2005;12(4):287–90.
5. Forton F, Seys B. Density of Demodex folliculorum in rosacea: A case-control study using standardized skin-surface biopsy. Br J Dermatol 1993;128(6):650–9.
6. Karabay EA, Demirel ÖU. Evaluation of demodicosis, nailfold capillaroscopy, and oxidative stress in rosacea: A case-control study. Postepy Dermatol Alergol 2021;38(4):590–6.
7. O'Reilly N, Bergin D, Reeves EP, McElvaney NG, Kavanagh K. Demodex-associated bacterial proteins induce neutrophil activation. Br J Dermatol 2012;166(4):753–60.
8. Georgala S, Katoulis AC, Kylafis GD, Koumantaki-Mathioudaki E, Georgala C, Aroni K. Increased density of Demodex folliculorum and evidence of delayed hypersensitivity reaction in subjects with papulopustular rosacea. J Eur Acad Dermatol Venereol 2001;15(5):441–4.
9. Akilov OE, Mumcuoglu KY. Immune response in demodicosis. J Eur Acad Dermatol Venereol 2004;18(4):440–4.
10. Rather PA, Hassan I. Human demodex mite: The versatile mite of dermatological importance. Indian J Dermatol 2014;59(1):60–6.
11. Yun SH, Levin F, Servat J. Demodex folliculitis presenting as periocular vesiculopustular rash. Orbit 2013;32(6):370–1.
12. Ivy SP, Mackall CL, Gore L, Gress RE, Hartley AH. Demodicidosis in childhood acute lymphoblastic leukemia; An opportunistic infection occurring with immunosuppression. J Pediatr 1995;127(5):751–4.
13. Gökçe C, Aycan-Kaya Ö, Yula E, et al. The effect of blood glucose regulation on the presence of opportunistic Demodex folliculorum mites in patients with type 2 diabetes mellitus. J Int Med Res 2013;41(5):1752–8.
14. Karincaoglu Y, Esrefoglu Seyhan M, Bayram N, Aycan O, Taskapan H. Incidence of Demodex folliculorum in patients with end stage chronic renal failure. Ren Fail 2005;27(5):495–9.
15. Forton FMN, De Maertelaer V. Which factors influence Demodex proliferation? A retrospective

pilot study highlighting a possible role of subtle immune variations and sebaceous gland status. J Dermatol 2021;48(8):1210–20.
16. Molho-Pessach V, Meltser A, Kamshov A, Ramot Y, Zlotogorski A. STAT1 gain-of-function and chronic demodicosis. Pediatr Dermatol 2020;37(1):153–5.
17. Hsu CK, Hsu MML, Lee JYY. Demodicosis: A clinicopathological study. J Am Acad Dermatol 2009;60(3):453–62.
18. Navel V, Mulliez A, Benoist d'Azy C, et al. Efficacy of treatments for Demodex blepharitis: A systematic review and meta-analysis. Ocul Surf 2019;17(4):655–69.
19. Shah PP, Stein RL, Perry HD. Update on the management and treatment of Demodex blepharitis. Cornea 2022;41(8):934–9.

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Author Contributions

Brittany Perzia – Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Despoina Theotoka – Design of the work, Acquisition of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Jane Spadaro – Design of the work, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Larissa Habib – Conception of the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Conflict of Interest
Authors declare no conflict of interest.

Data Availability
All relevant data are within the paper and its Supporting Information files.