

Demodex Blepharitis: Diagnosis and Treatment

By Hosam Sheha, MD, PhD, Lingyi Liang, MD, PhD, Scheffer Tseng, MD, PhD



Fig. 1A



Fig. 1B



Fig. 1C



Fig. 3A

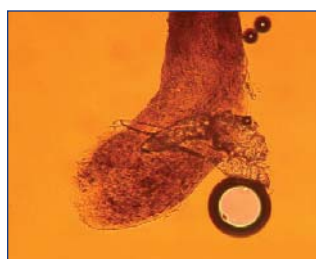


Fig. 3B

Overview:

Demodex infestation on the face has been implicated in causing rosacea (Fig.1A)¹⁻⁵. In the eyelids, Demodex infestation gives rise to blepharitis.⁶⁻⁹ Such blepharitis is frequently associated with mite-harboring cylindrical dandruff in eyelashes (Fig.1B).¹⁰ Demodex *folliculorum* tends to be clustered to the root of the lashes (Fig. 1C), while demodex *brevis* tends to present individually in sebaceous and meibomian glands.

As previously reported,¹¹⁻¹³ office lid scrub with 50% tea tree oil (TTO) combined with daily lid hygiene with 5% TTO ointment and shampoo can eradicate ocular demodex.

Ocular Manifestations:

Lashes with cylindrical dandruff are pathognomonic for ocular demodex infestation (Fig. 1B).¹⁰ Demodex has also been associated with intermittent trichiasis, meibomian gland dysfunction, conjunctival inflammation (Fig. 2A),¹² corneal vascularization, infiltration, superficial opacities, and nodular scarring (Fig. 2B, 2C).¹³



Fig. 2A

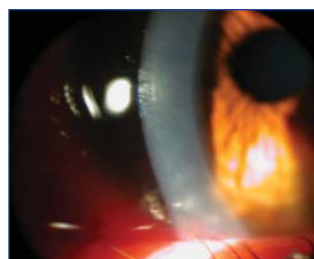


Fig. 2B

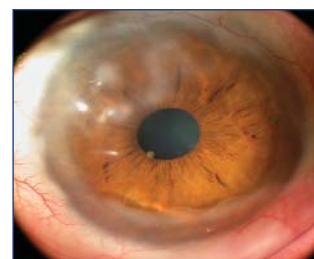


Fig. 2C

Diagnosis:

Lash Sampling Procedure:

A modified method of sampling and counting *demodex* has been established.^{10,14} Under the slit lamp, epilate two lashes, with cylindrical dandruff, from each eyelid (8 lashes from both eyes). Place the lashes on a slide, one for each eye, and examine them using the light microscope. Fluorescein 0.25% drops can improve the visibility of the mites (Fig. 3A, 3B).¹⁴

Infrared Photography:

It has been reported that infrared photography illustrates that temperature and skin inflammation are directly proportional to the amount of infestation resulting in “Fire-Red Demodex Face” (Fig. 4).¹²

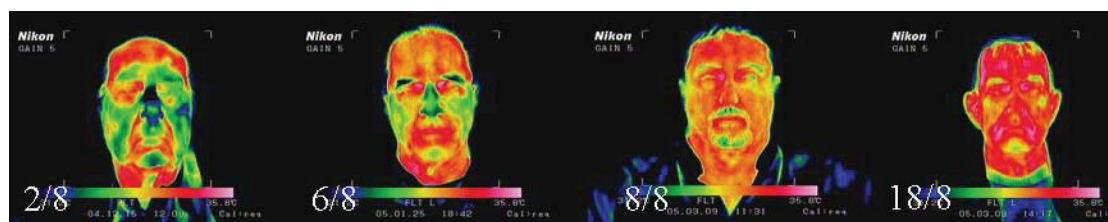


Fig. 4

Demodex Blepharitis: Diagnosis and Treatment (continued)

Key Treatment Steps:

1. **Office/Home** lid scrub regimen (Regimen A) using 50% TTO oil to clean the lashes and kill the mites.
2. **Home** regimen (Regimen B) using 5% TTO cream to cover the skin around the lids to prevent mating and re-infestation from the skin around the eye.

Treatment:

As reported,^{12,13} patients receiving 50% TTO lid scrub show dramatic improvements in symptoms, ocular surface inflammation, lipid tear film stability, corneal epithelial smoothness, and visual acuity (Fig. 5). The *demodex* count usually drops to zero in 4 weeks without recurrence in a majority of cases.

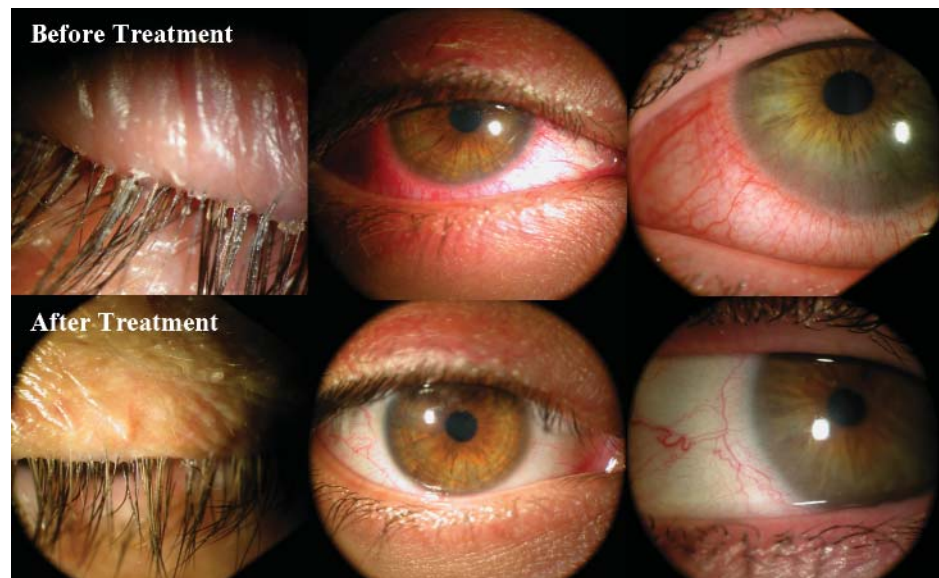


Fig. 5

References

1. Basta-Juzbasic A, Subic JS, Ljubojevic S. Demodex folliculorum in development of dermatitis rosaceiformis steroidica and rosacea-related diseases. *Clin Dermatol* 2002;20:135-140.
2. Erbagci Z, Ozgoztasi O. The significance of Demodex folliculorum density in rosacea. *Int J Dermatol* 1998;37:421-425.
3. Forton F, Germaux MA, Brasseur T, De LA, Laporte M, Mathys C, Sass U, Stene JJ, Thibaut S, Tytgat M, Seys B. Demodicosis and rosacea: epidemiology and significance in daily dermatologic practice. *J Am Acad Dermatol* 2005;52:74-87.
4. Abd-El-Al AM, Bayoumy AM, bou Salem EA. A study on Demodex folliculorum in rosacea. *J Egypt Soc Parasitol* 1997;27:183-195.
5. 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;15:441-444.
6. Kamoun B, Fourati M, Feki J, Mlik M, Karray F, Trigui A, Ellouze S, Hammami B, Chaabouni M, Ayadi A. [Blepharitis due to Demodex: myth or reality?]. *J Fr Ophthalmol* 1999;22:525-527.
7. Humiczewska M. [Demodex folliculorum and Demodex brevis (Acarida) as the factors of chronic marginal blepharitis]. *Wiad Parazytol* 1991;37:127-130.
8. Coston TO. Demodex folliculorum blepharitis. *Trans Am Ophthalmol Soc* 1967;65:361-392.
9. Heacock CE. Clinical manifestations of demodicosis. *J Am Optom Assoc* 1986;57:914-919.
10. Gao Y-Y, Di Pascuale MA, Li W, Liu D, Baradaran-Rafii A, Elizondo A, Kuo IC, Kawakita T, Raju VK, Tseng SCG. High prevalence of ocular demodex in lashes with cylindrical dandruffs. *Invest Ophthalmol Vis Sci* 2005;46:3089-3094.
11. Gao Y-Y, Di Pascuale MA, Li W, Baradaran-Rafii A, Elizondo A, Raju VK, Tseng SCG. In vitro and in vivo killing of ocular demodex by tea tree oil. *Br J Ophthalmol* 2005;89:1468-1473.
12. Gao YY, Di Pascuale MA, Elizondo A, Tseng SC. Clinical treatment of ocular demodicosis by lid scrub with tea tree oil. *Cornea* 2007;26:136-143.
13. Kheirkhah A, Casas V, Li W, Raju VK, Tseng SC. Corneal manifestations of ocular demodex infestation. *Am J Ophthalmol* 2007;143:743-749.
14. Kheirkhah A, Blanco G, Casas V, Tseng SC. Fluorescein dye improves microscopic evaluation and counting of demodex in blepharitis with cylindrical dandruff. *Cornea* 2007;26:697-700.

Provided by

The Ocular Surface Research & Education Foundation (OSREF)

Visit www.osref.org to view the Ocular Research & Education Foundation's full library of medical education material

For additional clinical information, contact Scheffer C.G. Tseng, M.D., Ph.D. by phone at 305-274-1299 or by e-mail at stseng@ocularsurface.com.