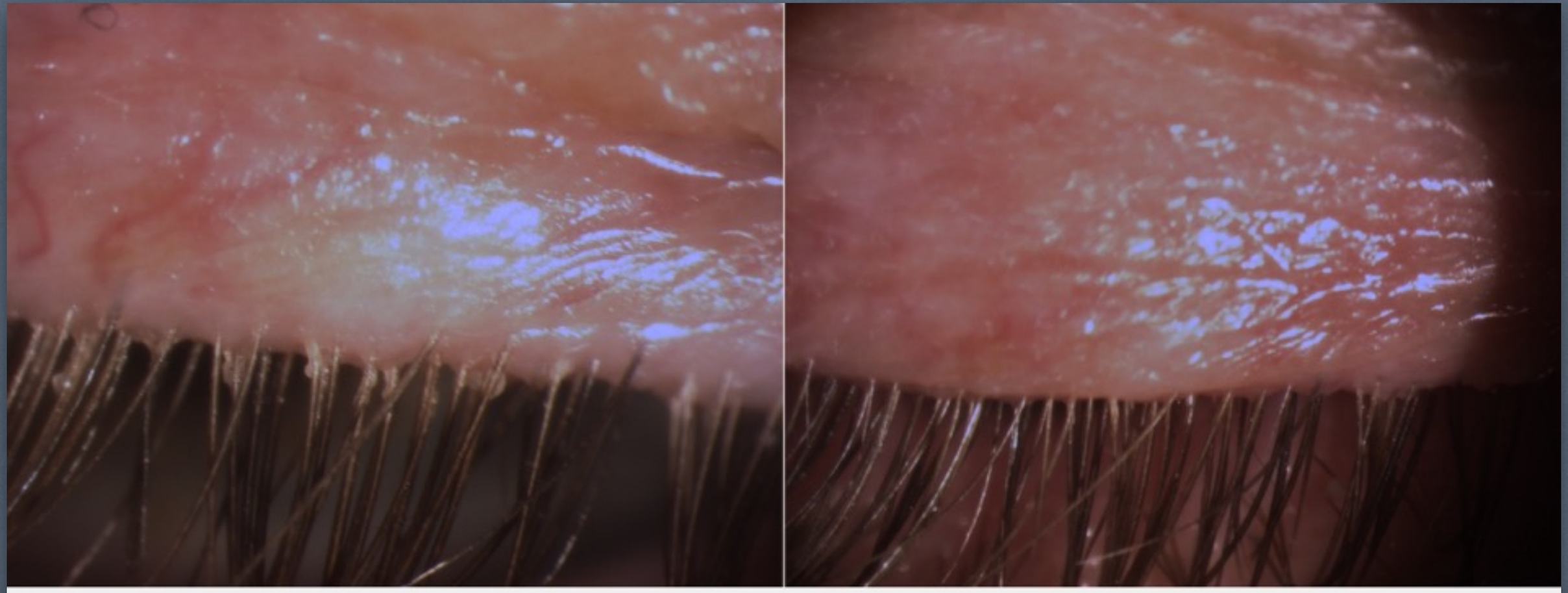
MANAGING THE LID MARGIN AND LASHES: IN-OFFICE PROCEDURES

Scott Schachter, OD
Pismo Beach, CA



DISCLOSURES

Allergan
Bausch and Lomb
BioTissue
Blephex
ScienceBased Health
TearScience

CONDITIONS TO CONSIDER

- COMMON CONDITIONS SEEN DAILY IN THE OPTOMETRIC PRACTICE. THIS COURSE WILL REVIEW THE PREVALENCE, DIAGNOSIS, AND THEN FOCUS ON IN-OFFICE TREATMENTS OPTIONS FOR EACH.

- MEIBOMIAN GLAND DYSFUNCTION
  - ANTEROPLACEMENT AND THICKENING OF LINE OF MARX
- DEMODEX BLEPHARITIS

MEIBOMIAN GLAND DYSFUNCTION

IN-OFFICE PROCEDURES

- MGD
  - LIPIFLOW
  - MiBoFlo ThermoFlo
  - MASKIN PROBING
  - MANUAL EXPRESSION
- ALTERATIONS IN LINE OF MARX
  - DEBRIDE
- BLEPHARITIS
  - BLEPHEX

MEIBOMIAN GLAND DYSFUNCTION

DEFINED

Meibomian gland dysfunction (MGD) is a chronic, diffuse abnormality of the meibomian glands, commonly characterized by terminal duct obstruction and/or qualitative/quantitative changes in the glandular secretion. It may result in alteration of the tear film, symptoms of eye irritation, clinically apparent inflammation, and ocular surface disease.

-TFOS INTERNATIONAL WORKSHOP ON MGD, 2011

MEIBOMIAN GLAND DYSFUNCTION

PREVALENCE

Table 2.

Frequency of MGD in Selected Clinical Populations

Study	*n*	Parameter	Frequency	Reference
Austria	97	Meibomian gland dysfunction	32.9% (95% CI, 23.8–43.5)	Horwath-Winter et al.[41]
California	398	Cloudy or absent secretion of meibum in lower lid	38.9% (95% CI, 34.0–44.0)	Hom et al.[35]
China	115	Meibomian gland dysfunction	34.8% (95% CI, 26.2–44.4)	Zhang et al.[42]
Japan	Sjögren's 19 Non-Sjögren's 27	Meibomian gland dropout in more than one half of inferior tarsus	57.9% 18.5%	Shimazaki et al.[43]
Japan	Asymptomatic 54	Meibomian gland dysfunction	61.0% (95% CI.	Shimazaki et al.[44]

The International Workshop on Meibomian Gland Dysfunction: Report of the Subcommittee on the Epidemiology of, and Associated Risk Factors for, MGD

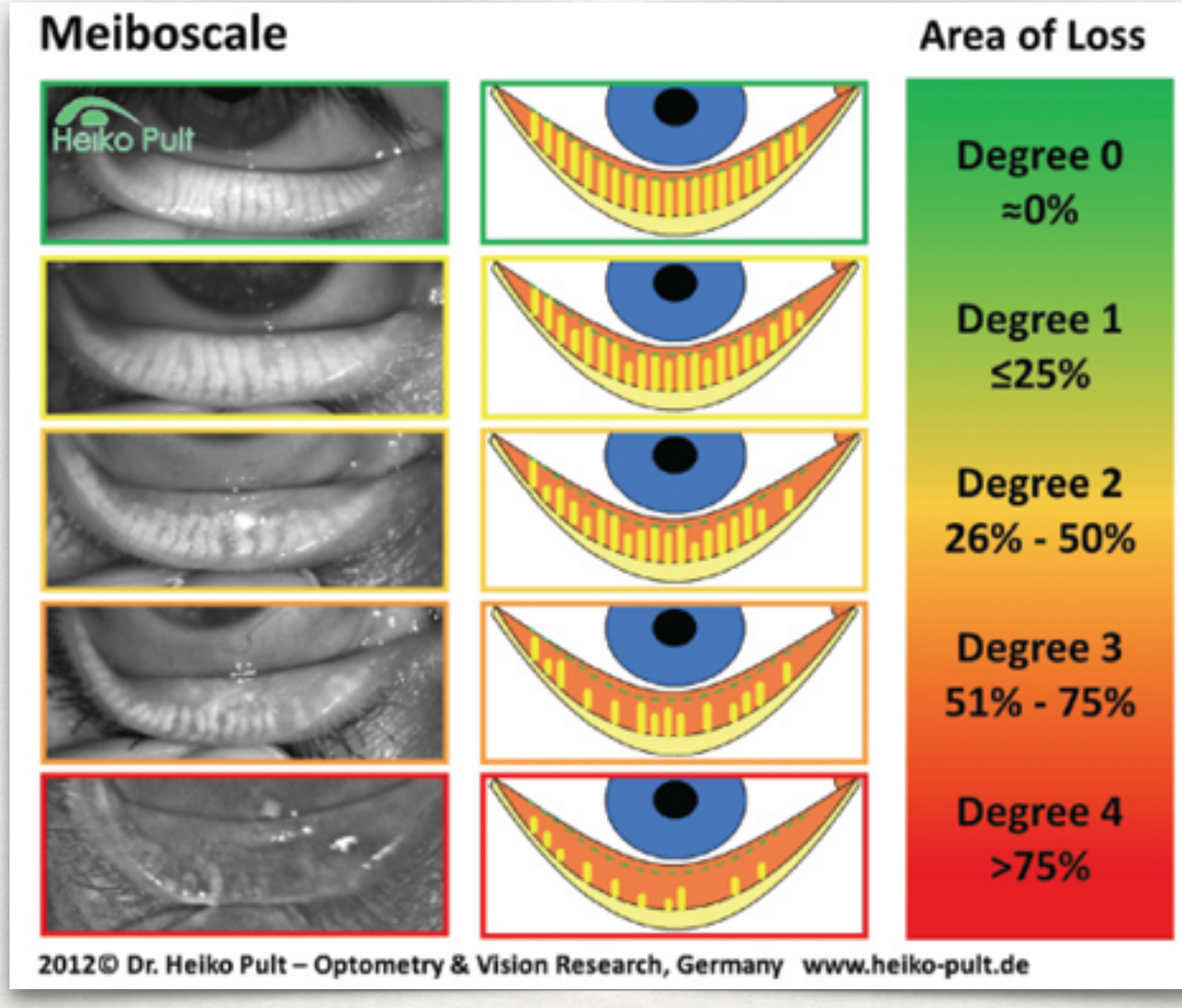
Debra A. Schaumberg,1 Jason J. Nichols,2 Eric B. Papas,3 Louis Tong,4 Miki Uchino,5 and Kelly K. Nichols2

MEIBOMIAN GLAND DYSFUNCTION

DIAGNOSIS

- Get a symptom baseline, SPEED or OSDI
- Grade the function and anatomy of the glands
  - Express glands, ideally with Meibomian Gland Evaluator (MGE), which mimics blink pressure, or your thumb
  - Count the number of functioning glands. Minimum of 6 should secrete oil
  - Visualize glands with transillumination or Lipiview, Lipiscan, or Keratograph

GRADING MG ANATOMY
MEIBOSCALE



GRADING MG FUNCTION

Grading scheme	Description
0	All glands patent. Clear fluid is expressed.
1	One or two glands partially obstructed. Clear to cloudy fluid is expelled on mild digital pressure.
2	Three or more partially obstructed glands. Cloudy or opaque fluid is expelled on digital pressure.
3	One or two blocked glands with many partially obstructed glands. Tear film foaming is noted along the lid margins. Inspissation noted; toothpaste-like expression with moderate to hard digital pressure.
4	Three or more blocked glands with the remaining glands partially obstructed. Meibum difficult to express, even with hard digital pressure.

DIAGNOSIS AND MANAGEMENT OF MEIBOMIAN GLAND DYSFUNCTION: OPTOMETRISTS' PERSPECTIVE

Dominick L Opitz,[1] Jennifer S Harthan,[1] Stephanie R Fromstein,[1] Scott G Hauswirth[2]

[1]Department of Clinical Education, Illinois College of Optometry, Chicago, IL, [2]Minnesota Eye Consultants, Minneapolis, MN, USA

IMAGING MEIBOMIAN GLANDS

TECHNIQUES AND IMAGES

- TRANSILLUMINATION
- OCULUS KERATOGRAPH
- TEARSCIENCE LIPISCAN
- TEARSCIENCE LIPIVIEW II

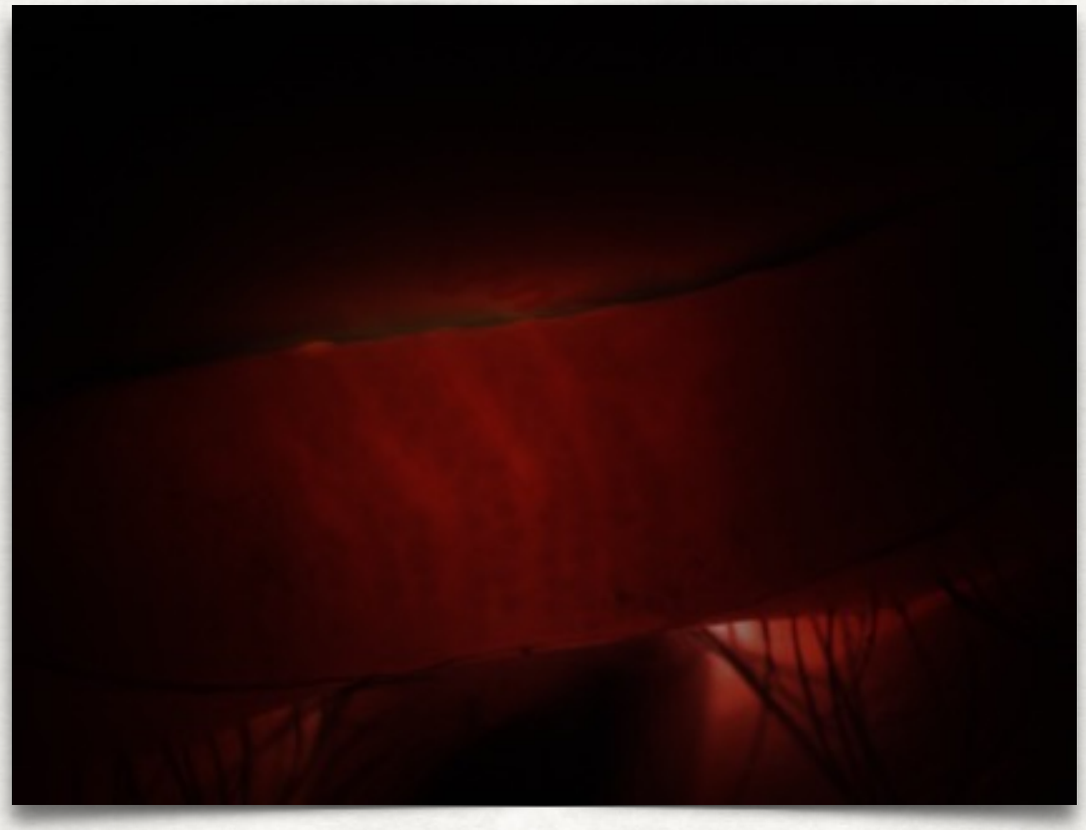
IMAGING MEIBOMIAN GLANDS

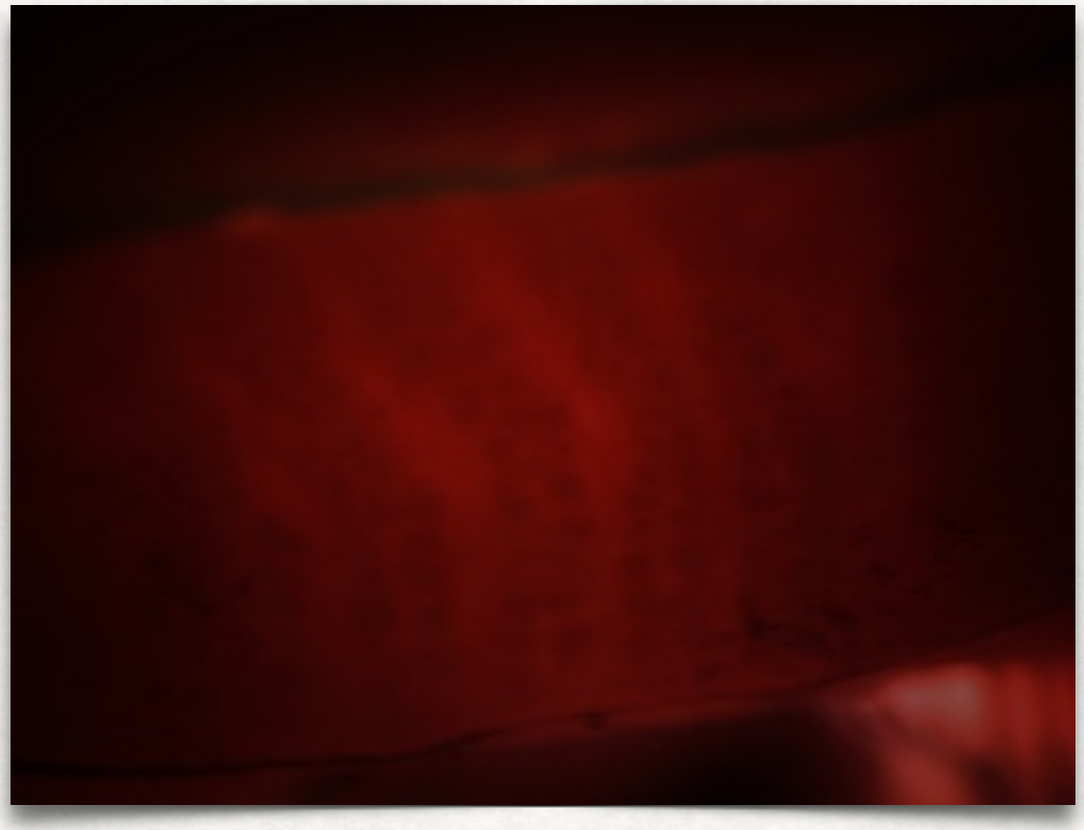
TRANSILLUMINATION

- Darken the exam room, evert the lower lid with transilluminator as patient looks up
- Slit lamp light is also off
- There should be around 25 glands in the lower lid
- Pros: inexpensive and quick
- Cons: this method include a limited field of view, low contrast between structures limiting visualization of details and some discomfort for the patient, cannot image uppers

IMAGING MEIBOMIAN GLANDS

TRANSILLUMINATION





Meibomian glands are dark, like tiger stripes

IMAGING MEIBOMIAN GLANDS

OCULUS KERATOGRAPH

Multi-function instrument:
Corneal topography
Anterior seg photography
Zernike, Fourier analysis
Contact lens fitting
Keratometry

JENVIS REPORT
Tear meniscus height
Lipid layer thickness
Meibomian gland imaging
Tear film break-up time

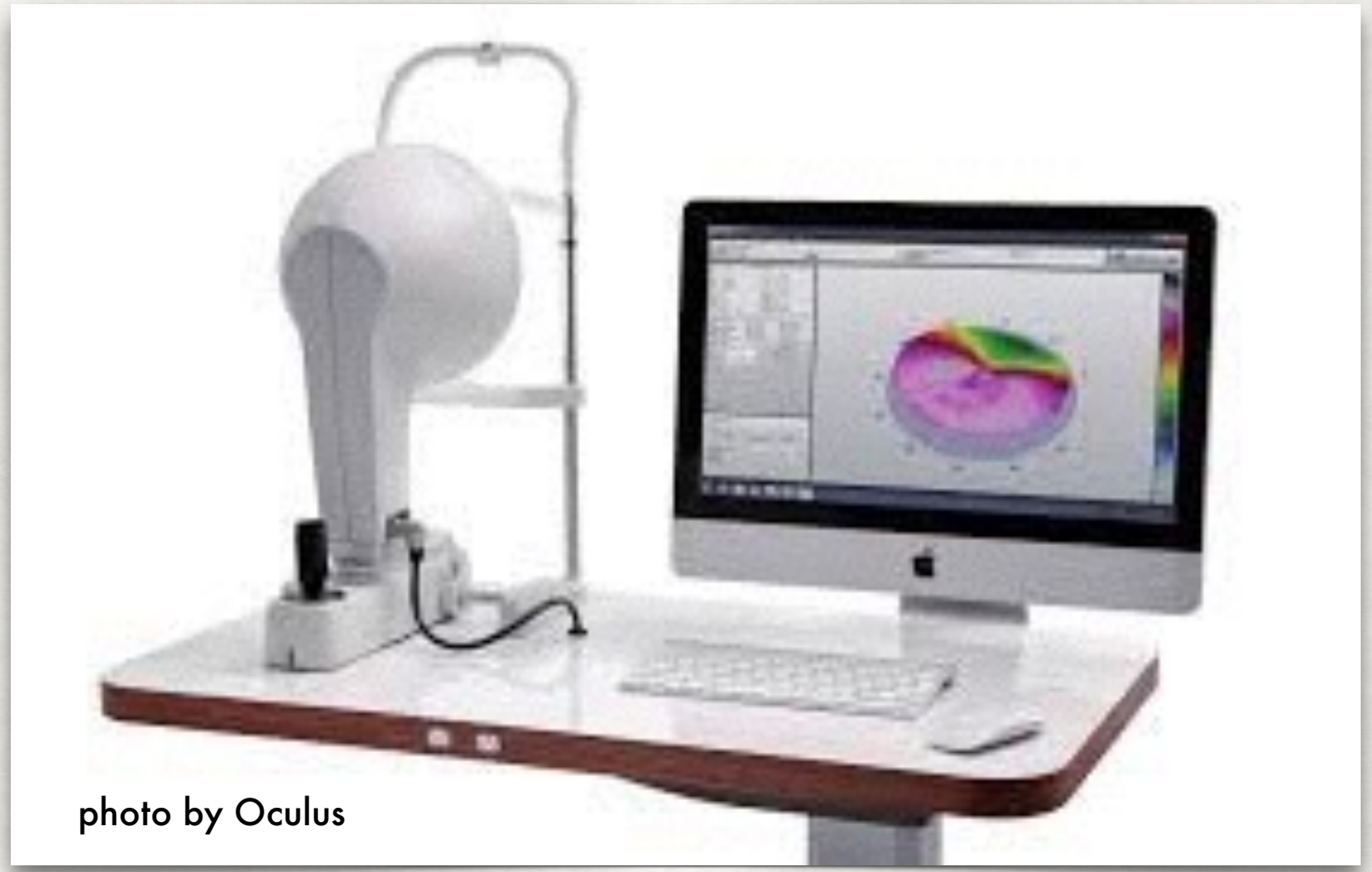


photo by Oculus

- Uses IR for gland imaging
- Images not as clear as TearScience products

IMAGING MEIBOMIAN GLANDS

OCULUS KERATOGRAPH

- 25 yo female
- Note gland tortuosity

IMAGING MEIBOMIAN GLANDS

TEARSCIENCE LIPISCAN

"The first and only dedicated high definition (HD) gland imager that allows eye care professionals (ECPs) to efficiently evaluate meibomian glands in busy practices.
The new rapid imager was created with end users in mind. Fast and intuitive, LipiScan harnesses patented dynamic meibomian imaging (DMI) technology to produce high definition images of meibomian glands. LipiScan allows ECPs to assess meibomian gland structure during routine workups in any practice setting."
Press Release

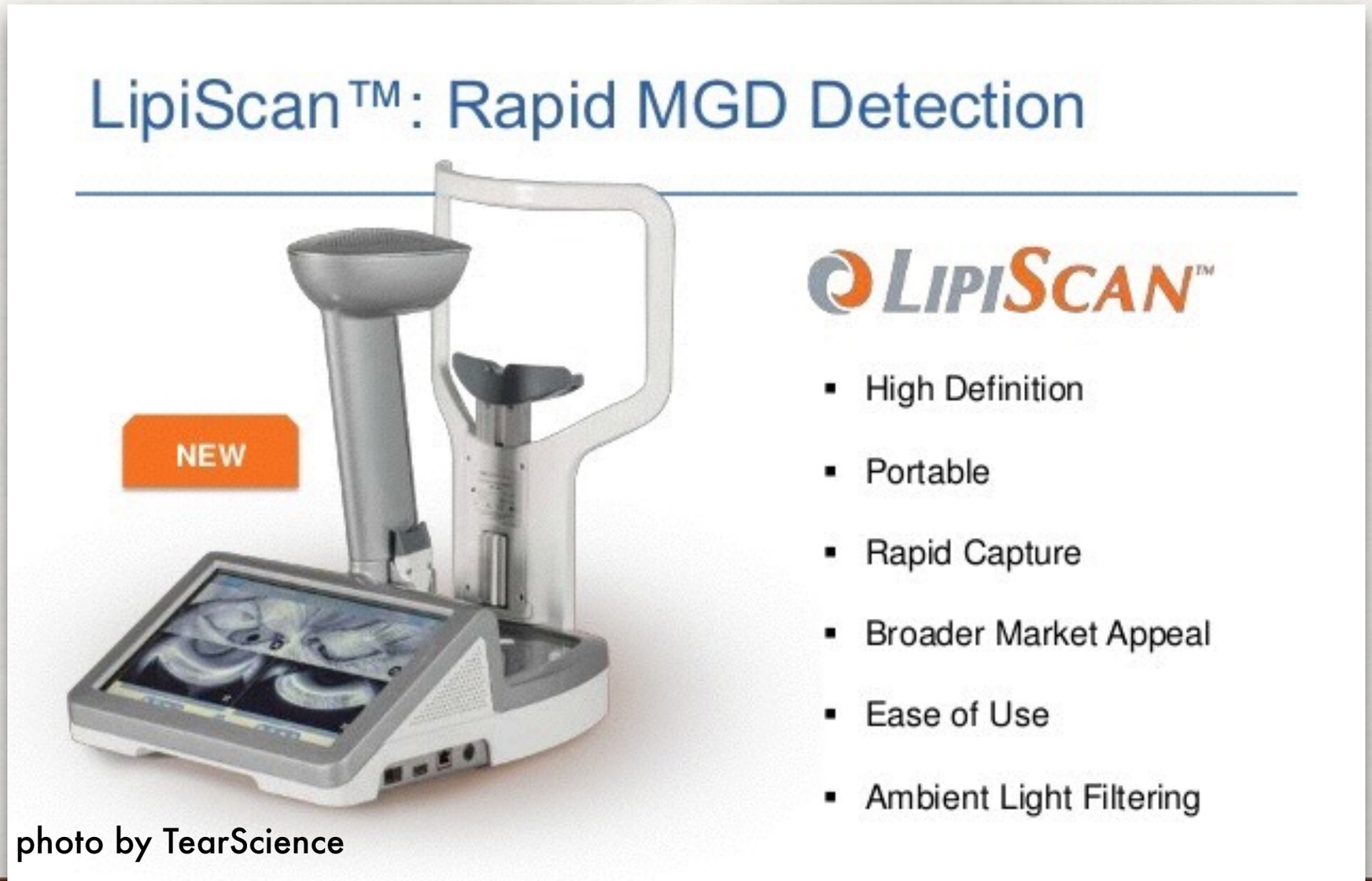


photo by TearScience

IMAGING MEIBOMIAN GLANDS

TEARSCIENCE LIPISCAN

Note gland tortuosity

IMAGING MEIBOMIAN GLANDS

TEARSCIENCE LIPIVIEW II

Indications for Use: The LipiView II Ocular Surface Interferometer is an ophthalmic imaging device that is intended for use by a physician in adult patients to capture, archive, manipulate and store digital images of:

- Specular (interferometric) observations of the tear film. Using these images, LipiView II measures the absolute thickness of the tear film lipid layer.
- Meibomian glands under near-infrared (NIR) illumination.
- The ocular surface and eyelids under white illumination. -TearScience

photo by TearScience

IMAGING MEIBOMIAN GLANDS

TEARSCIENCE LIPIVIEW II

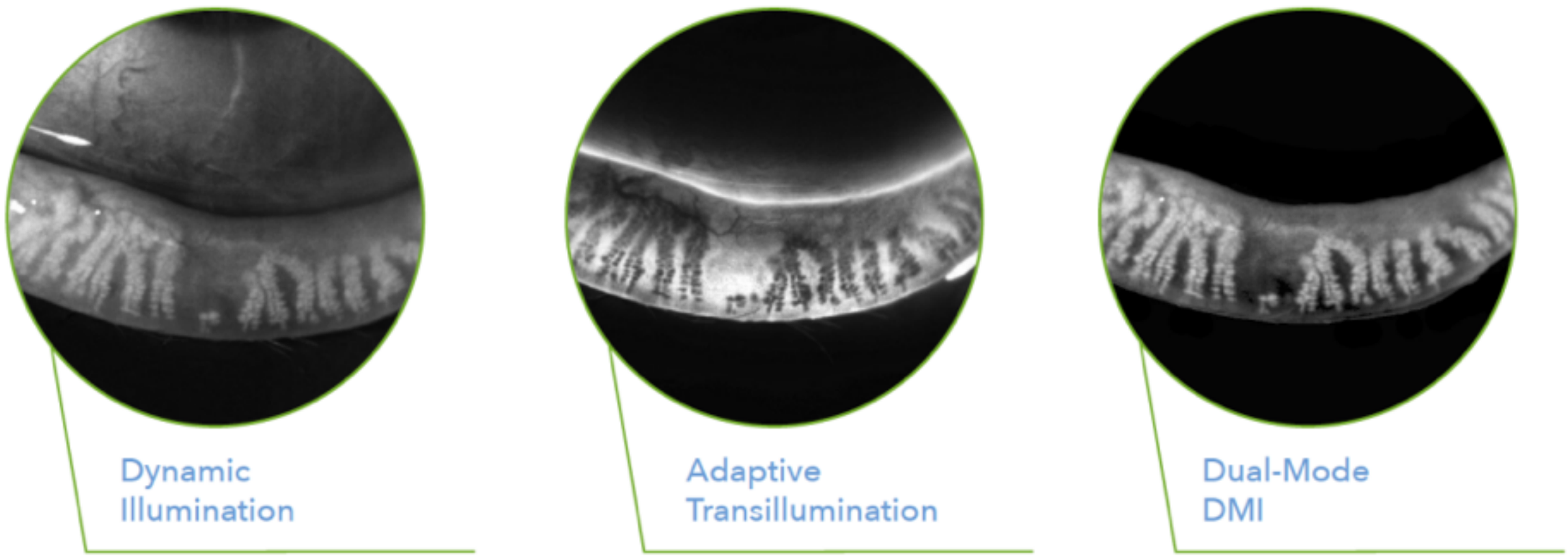


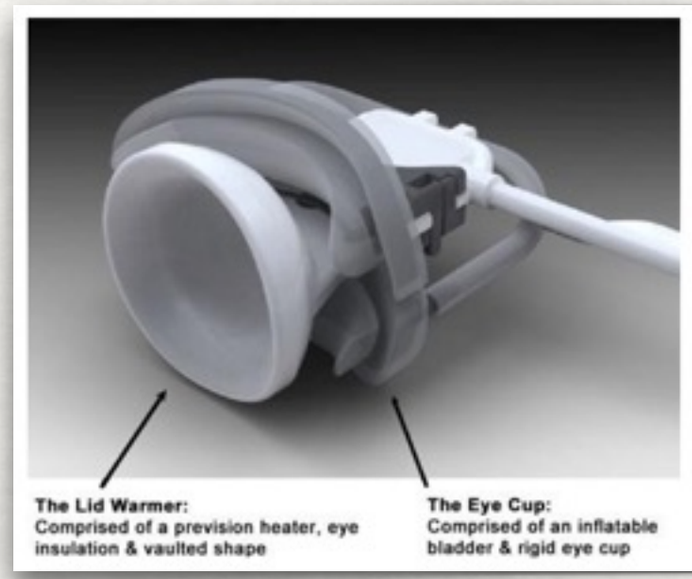
photo by TearScience

MGD TX

TEARSCIENCE LIPIFLOW

- The LipiFlow® Activator, a single-use sterile device, safely and comfortably delivers automated therapeutic energies to each meibomian gland while protecting the delicate structures of the patient's eye.
- Supported by 36 patents and seven years of dedicated research, LipiFlow® provides a level of accuracy and quality that allows eye care professionals to treat their MGD patients with confidence and ease.
- Takes 12 minutes to do both eyes (at the same time)
- Comfortable to patients
- Has consumable costs
- Single treatment lasts 1 year minimum.

photos by TearScience



MGD TX

MIBOFLO THERMOFLO

- The MiBoFlo Thermoflo® is a new therapeutic device for the treatment of dry eye. It employs a proprietary thermoelectric heat pump designed to liquify inspissated secretions and improve meibomian glandular function.

- The MiBo delivers an effective temperature of 108 degrees within a variance of less than 3%. The unit has an adjustable timer allowing for physician-controlled customization of therapy.

- Perform three consecutive treatments. The first is 12 minutes per lid, the second is performed 1 week later and lasts 10 minutes per lid, and the third is performed 2 weeks later and lasts 8 to 10 minutes per lid.

- No consumables

- Lacks peer-reviewed research

photo by
MIBOFLO

MGD TX

MASKIN MEIBOMIAN GLAND INTRADUCTAL PROBE

- A cannula used to open obstructed glands
- Topical anesthetic is used
- Seems to provide relief, between 1-6 months, up to 18 months
- Can provide quick relief, but may be uncomfortable and cause orifice heme

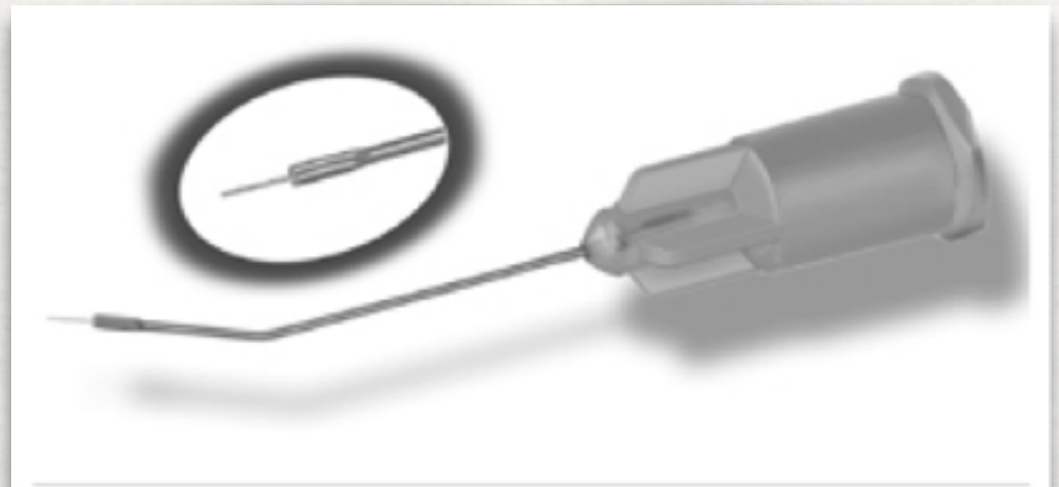
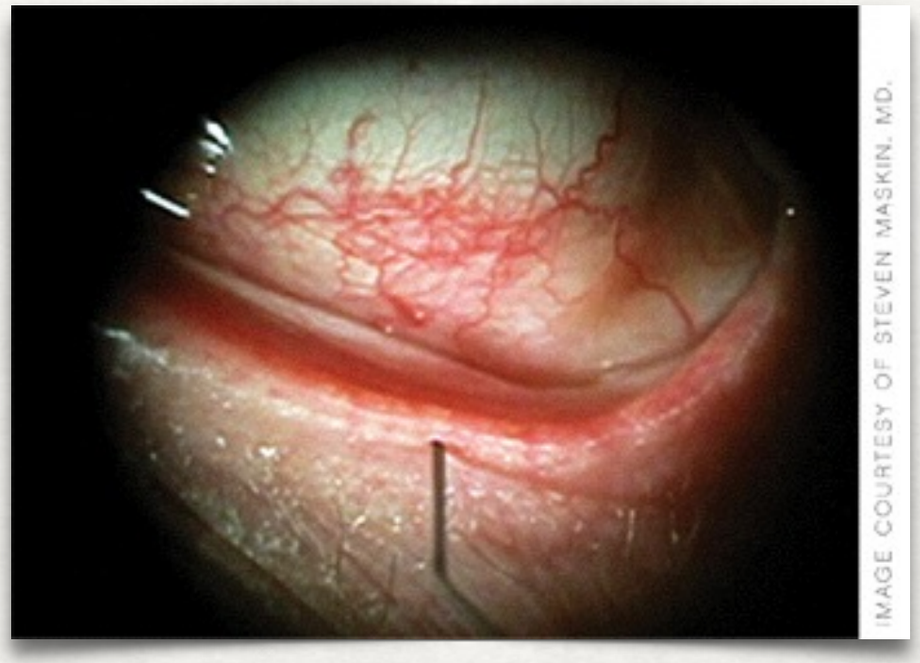


FIGURE 1 Maskin™ 2 mm Meibomian Gland Intraductal Probe. *(Photo courtesy Rhein Medical.)*



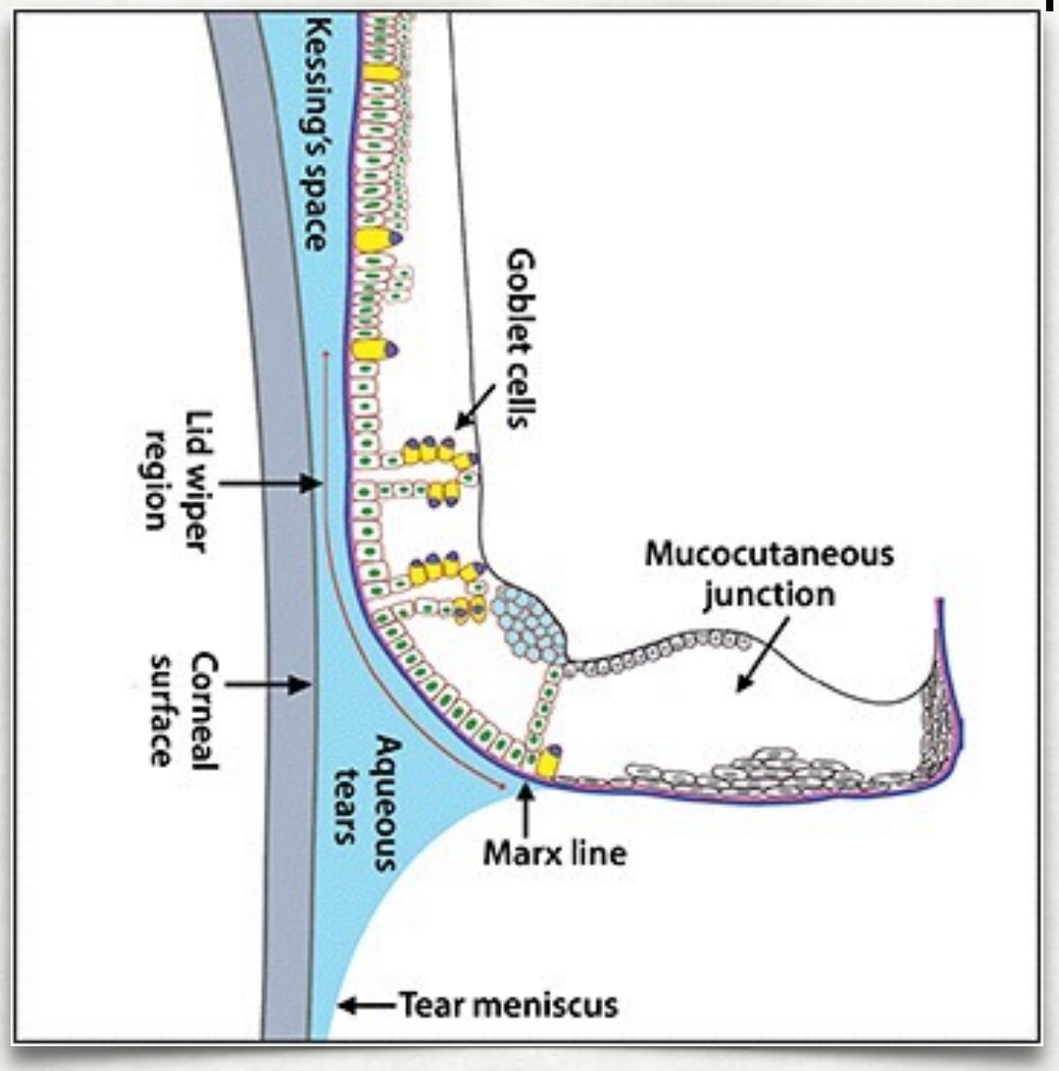
MGD TX
MASTROTA PADDLE

- Titanium. Smooth. Designed to gently and effectively express meibum from the meibomian glands.
- When positioned behind the anesthetized eyelid parallel to the glands, gentle digital pressure on the outer lid prompts meibum egress.
- Heat with Bruder mask or similar for 7-10 minutes
- Instill 1 drop proparacaine
- Wear gloves, can use cotton bud.
- Start nasally and work temporally
- Work from the distal end of the gland toward proximal
- Use firm, steady pressure. Give thickened oil time to express.
- Pros: inexpensive, gives symptomatic relief
- Cons: uncomfortable for patients, may need to be repeated often, time consuming (warm compresses prior)

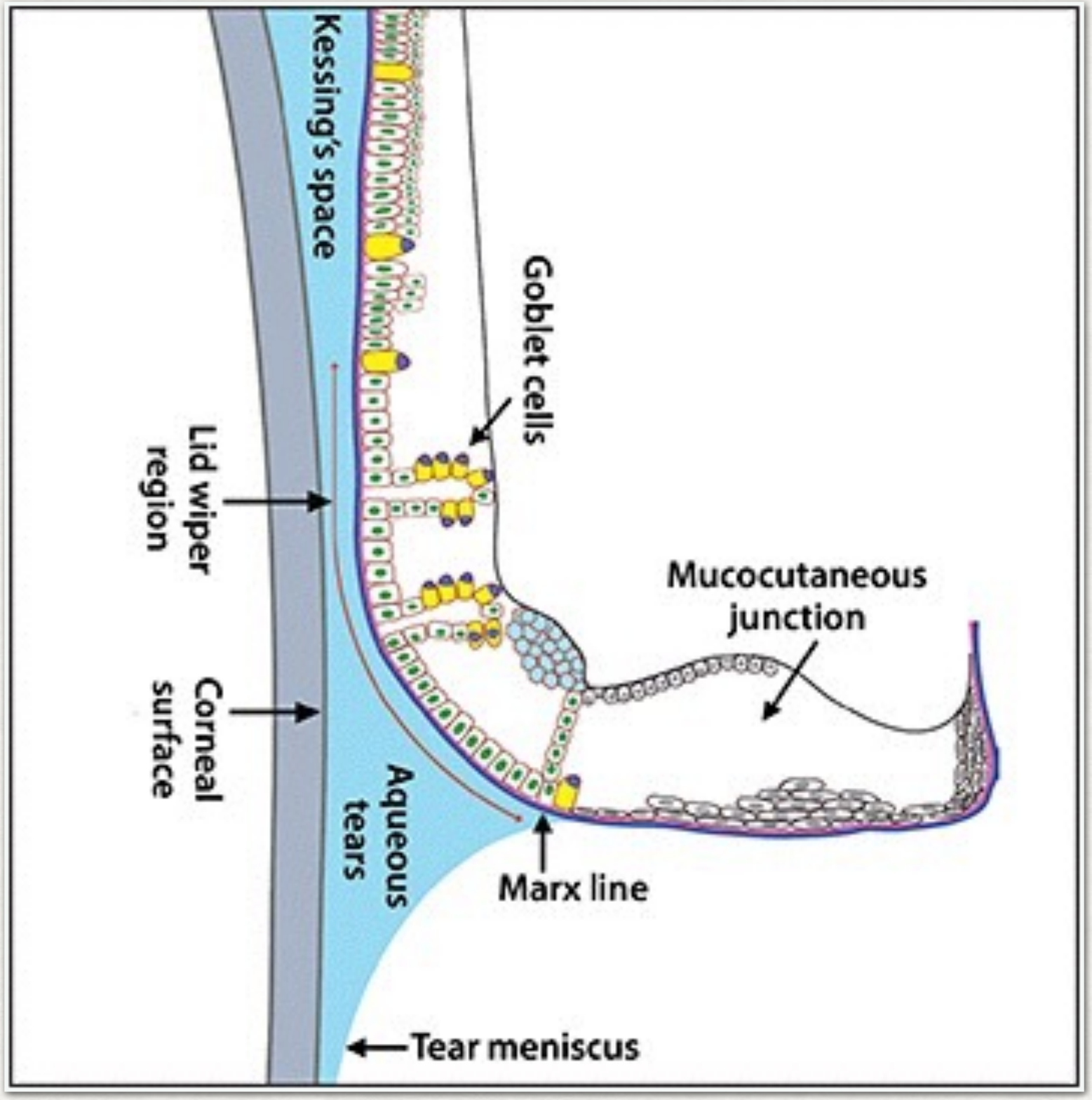
ANTEROPLACEMENT OF LINE OF MARX

REVIEW OF ANATOMY

- The line of Marx is the mucocutaneous junction between palpebral conjunctiva and the eyelid just posterior to the meibomian glands, is around 0.1mm wide, and visible upon upgaze without lid eversion. It is the separation of keratinized and non-keratinized epithelium.



Korb DR, Herman JP, Greiner JV, Scaffidi RC, Finnemore VM, Exford JM, Blackie CA, Douglass T. Lid wiper epitheliopathy and dry eye symptoms. Eye Contact Lens. 2005 Jan;31:2-8.



Korb DR, Herman JP, Greiner JV, Scaffidi RC, Finnemore VM, Exford JM, Blackie CA, Douglass T. Lid wiper epitheliopathy and dry eye symptoms. Eye Contact Lens. 2005 Jan;31:2-8.

ANTEROPLACEMENT OF LINE OF MARX

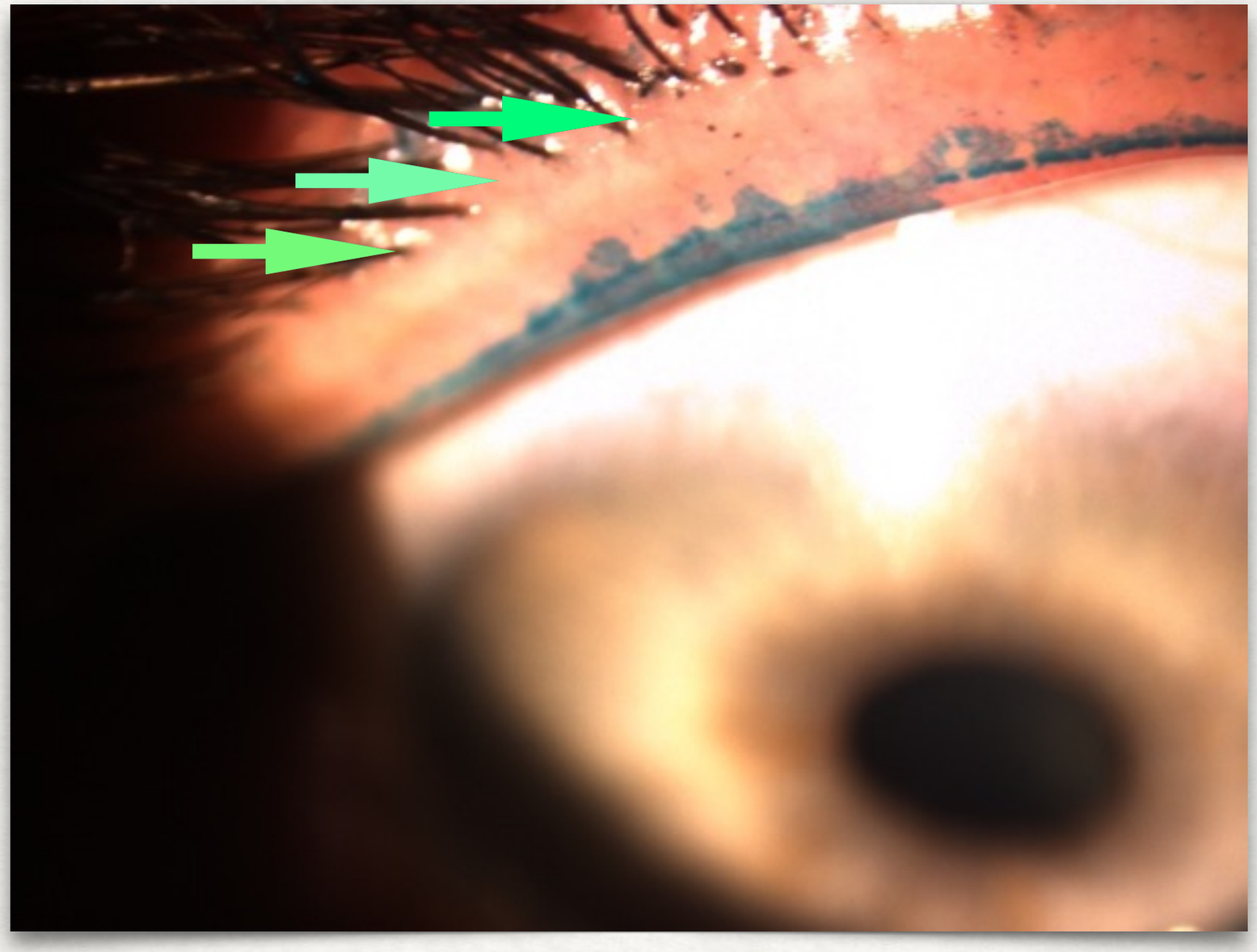
DIAGNOSIS

- APPLY LISSAMINE GREEN
- LOOK AT THE LINE OF MARX
- NORMAL IS A THIN, STRAIGHT LINE
- LOOK FOR ENCROACHMENT TOWARD MEIBOMIAN GLANDS AND ELEVATION
- STAINING TOWARD THE EYE IS LID WIPER EPITHELIOPATHY (FRICTION)

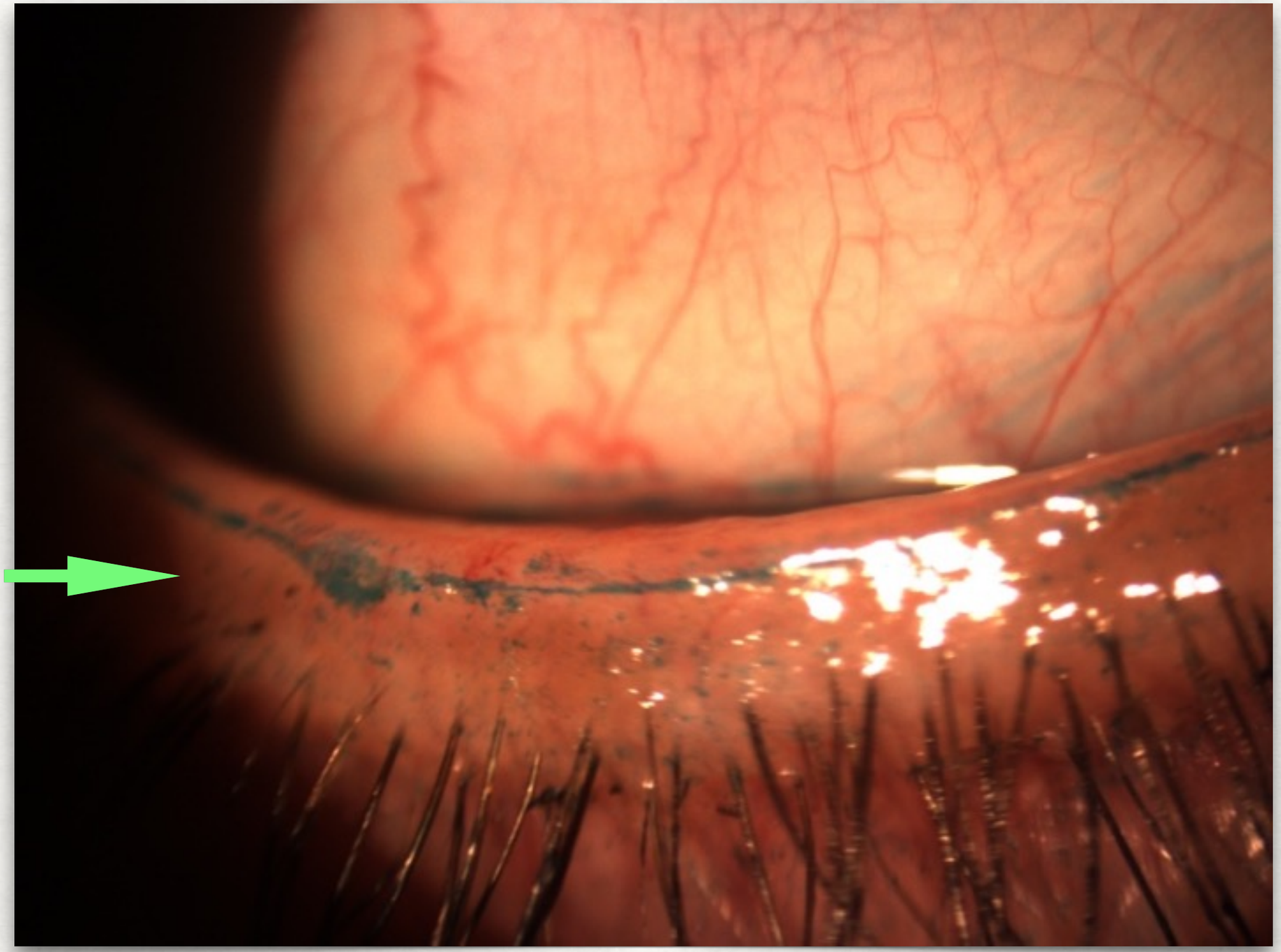
ANTEROPLACEMENT OF LINE OF MARX

DIAGNOSIS

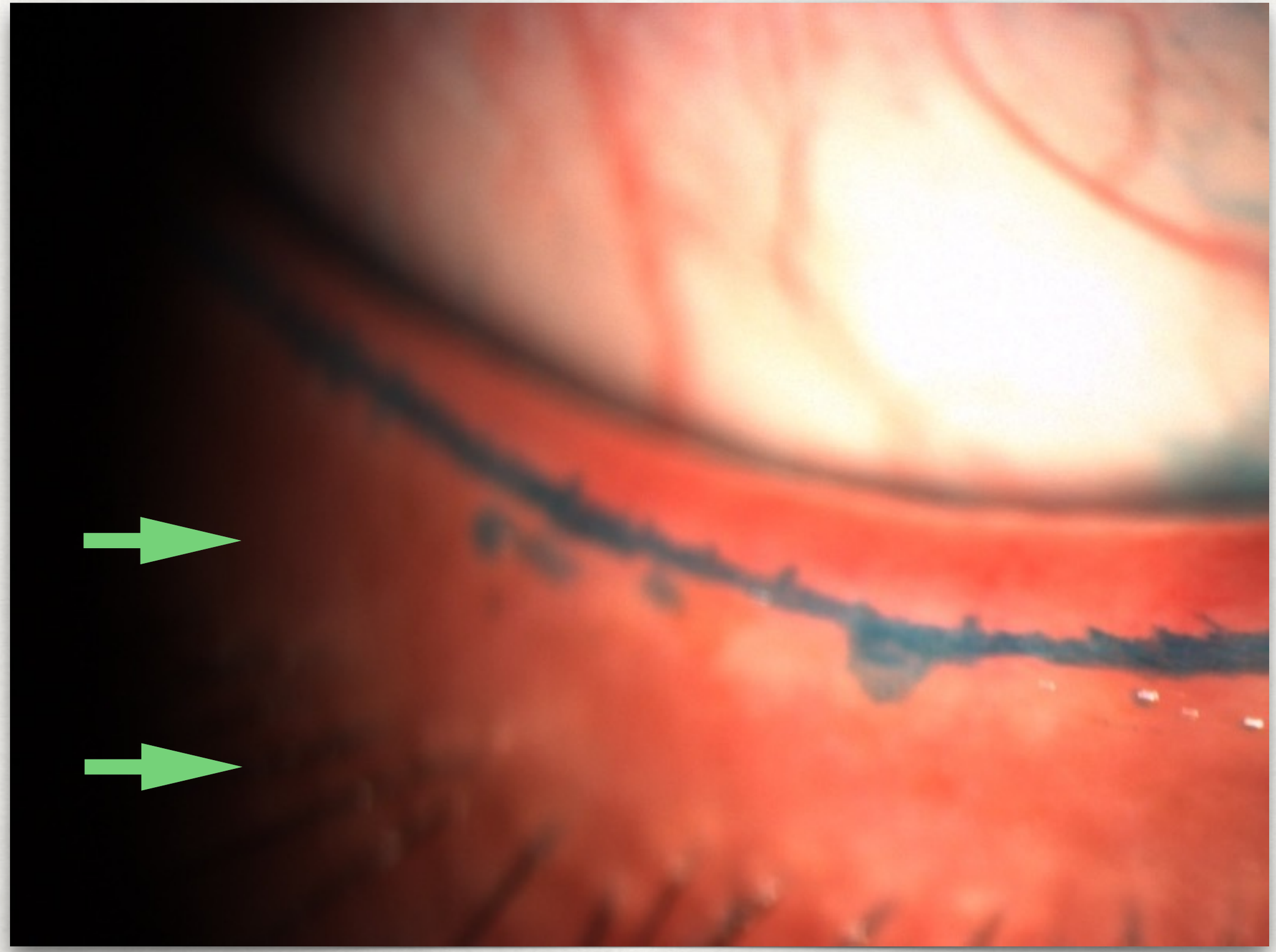
- Note encroachment toward MGs
- LWE also present



ANTEROPLACEMENT OF LINE OF MARX



ANTEROPLACEMENT OF LINE OF MARX



LID WIPER EPITHELIOPATHY

GRADING SCALE

TABLE 1

Grading of Lid Wiper Epitheliopathy* (Korb et al, 2005)

	GRADE 0	GRADE 1	GRADE 2	GRADE 3
Horizontal length of staining	<2mm	2mm to 4mm	5mm to 9mm	>9 mm
Average sagittal width of staining	<25%	25% to 50%	50% to 75%	>75%

** The individual grades for each of the two characteristics are averaged for a final grade for staining.*

Pult, H. "Dry eye in soft contact lens wearers." C*ont Lens Spect 7* (2011): 26-53.

ANTEROPLACEMENT OF LINE OF MARX

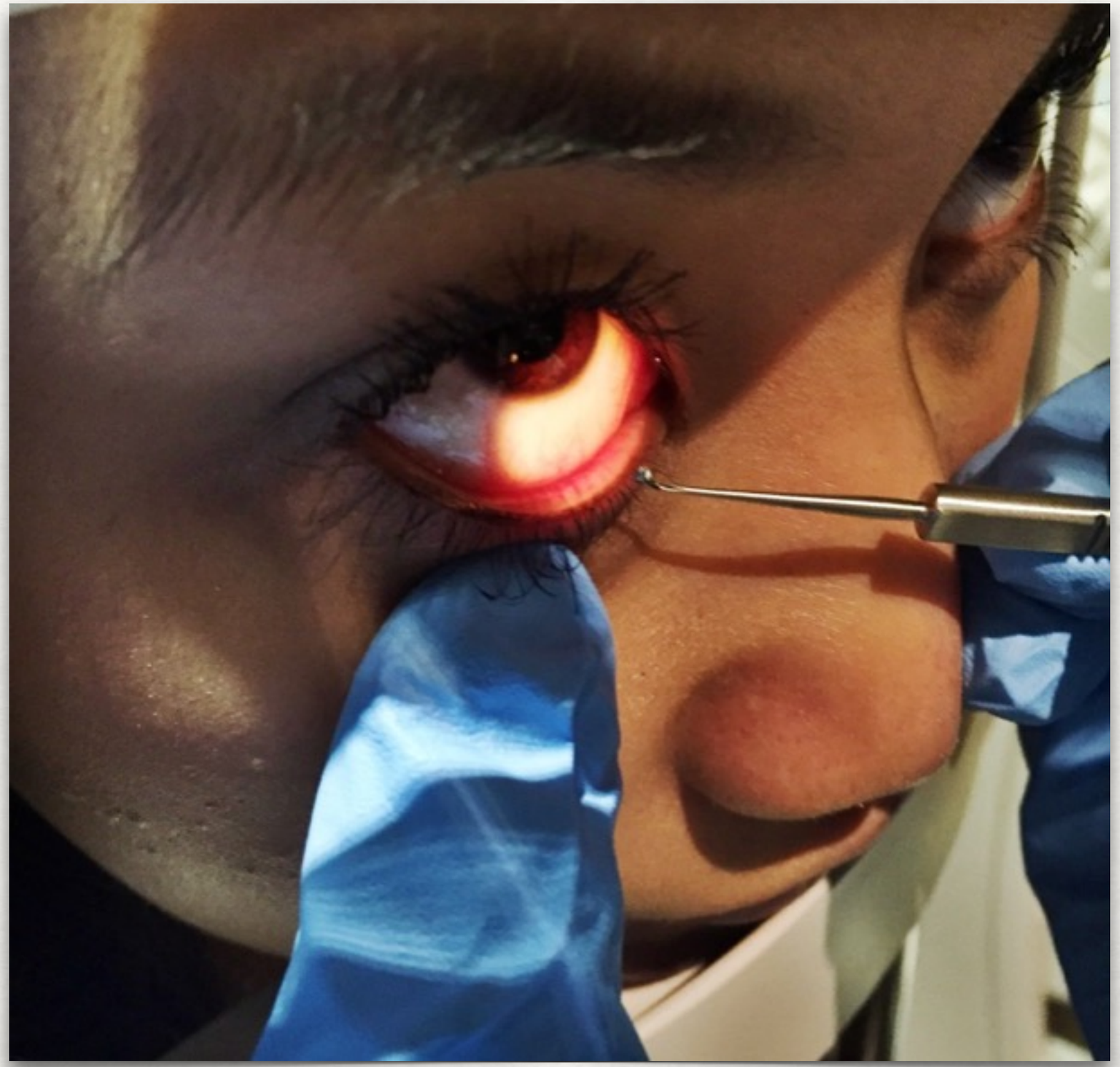
THE PROCEDURE

- Apply proparacine or tetravisc in the eye and have the patient blink
- Instill lissamine green
- Visualize the Line of Marx (LOM)
- Use a golf club spud or chalazion scoop
- Debride entire width of the keratinized lower lid margin, going over the meibomian glands, followed by debridement of the stained LOM
- Do not debride the lid wiper region

ANTEROPLACEMENT OF LINE OF MARX

SUBSET OF MGD: DEBRIDE SCALE

Start nasally and work laterally. Go over LOM and then over MGs.



DEMODEX BLEPHARITIS

DIAGNOSIS

- Cylindrical dandruff is pathognomonic
- Other signs:
  - conjunctival redness
  - madarosis
  - misdirected lashes
  - weak, brittle lashes
  - lid hyperemia
  - lid telangiectasia
  - lash distention

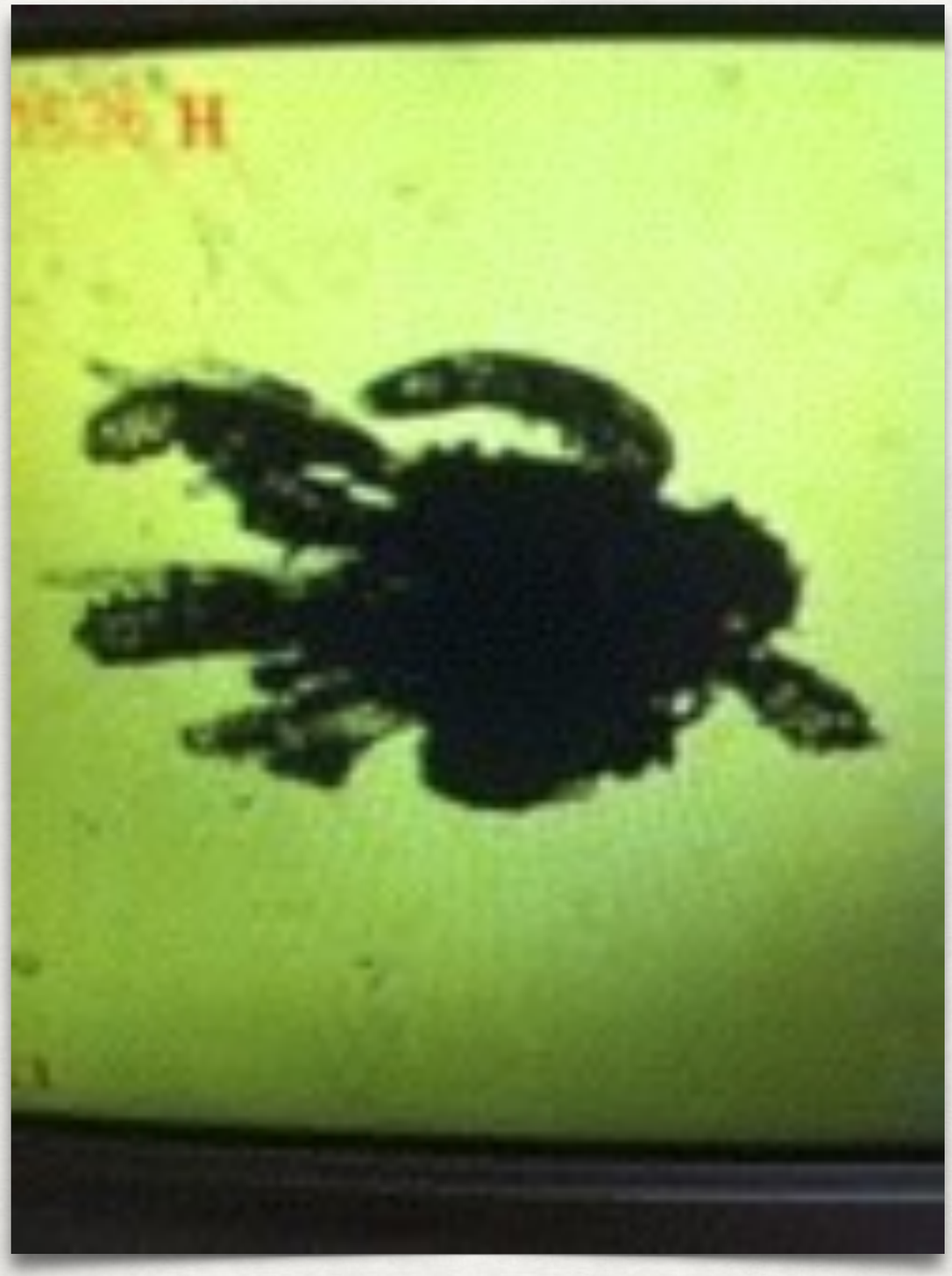
DEMODEX BLEPHARITIS

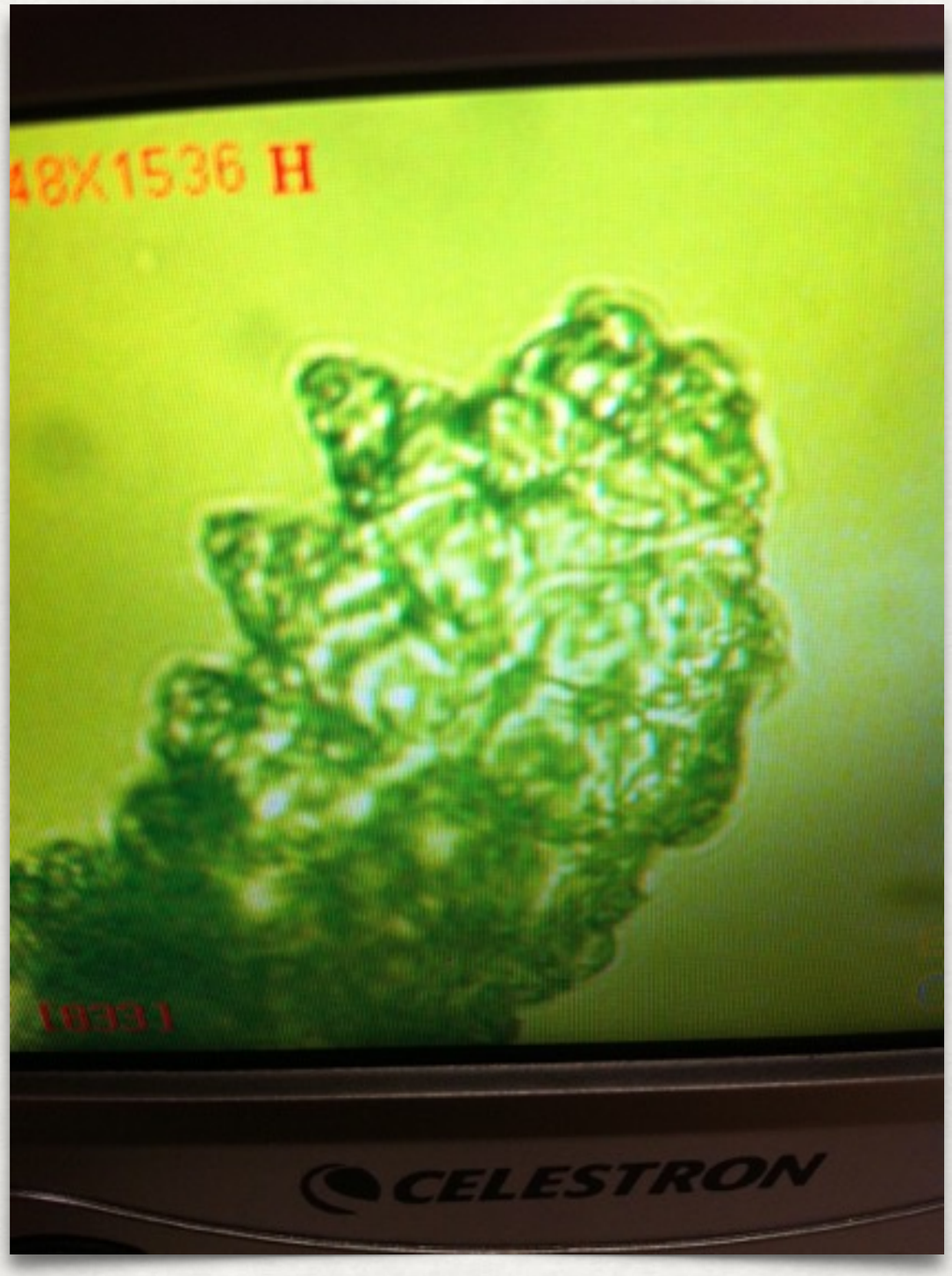
PREVALENCE

- Demodex blepharitis was present in 32.4% of all subjects
- (Scott E Schachter; Aubrey Schachter; Milton M Hom; Scott G Hauswirth, ARVO, 2014)

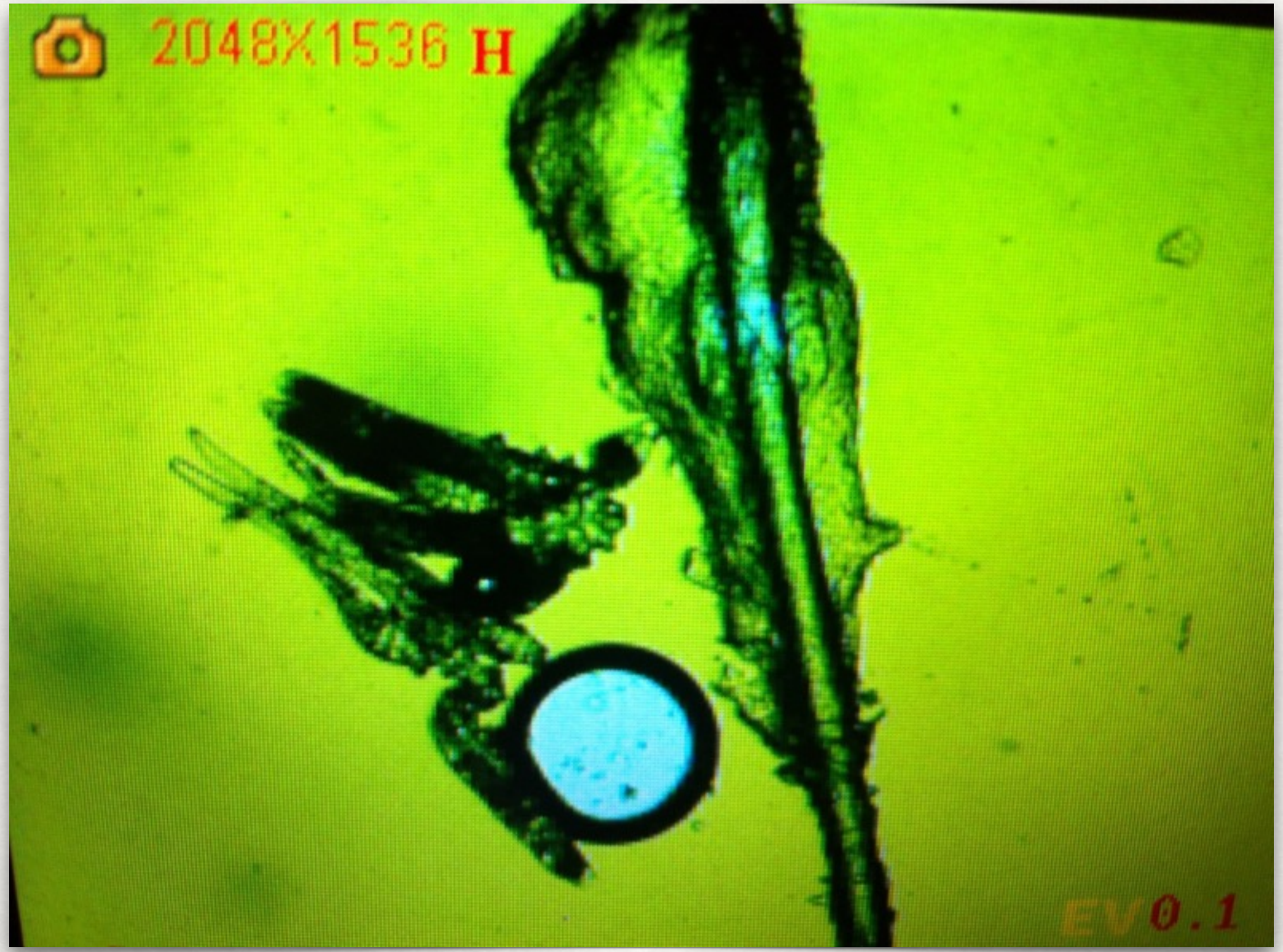
DEMODEX BLEPHARITIS

MICROSCOPIC APPEARANCE





DEMODEX BLEPHARITIS

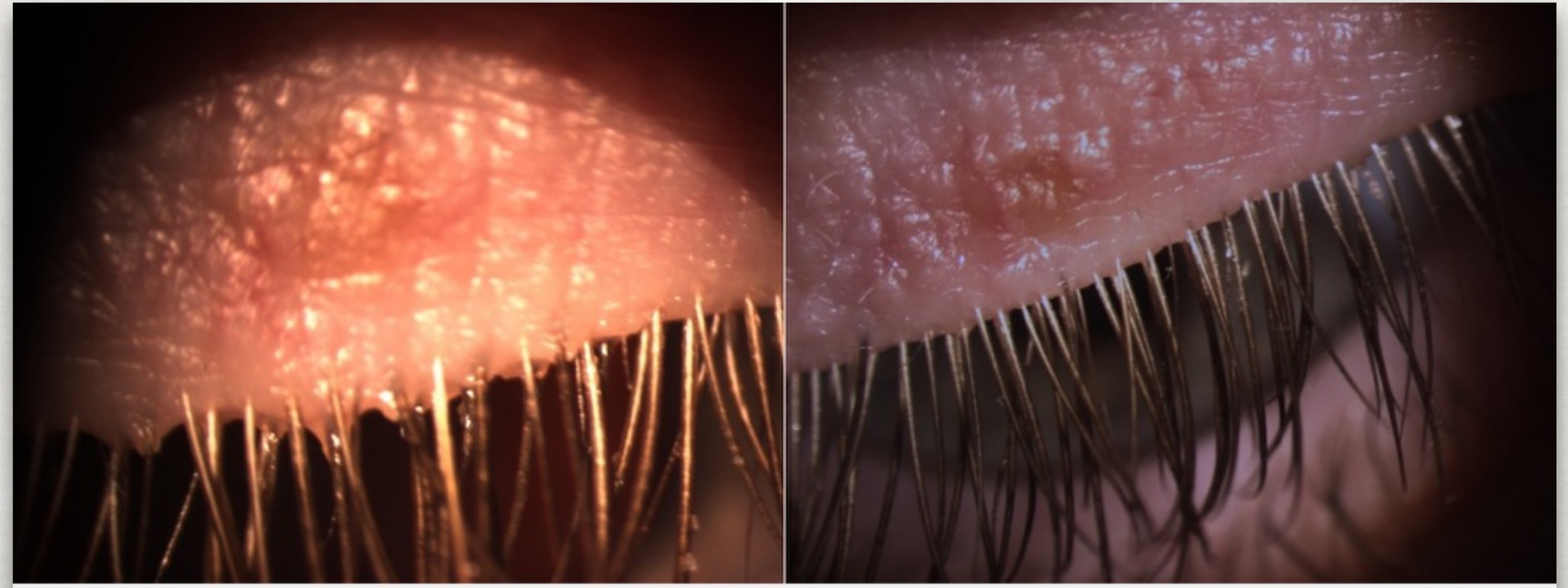


DEMODEX BLEPHARITIS

CLINICAL CASE

- 22 yo male. Note uneven lid line and lash distribution, lash distention,collarettes

- Before and after 1 month, Cliradex wipes, bid, OU



DEMODEX BLEPHARITIS

BLEPHEX BY RYSURG

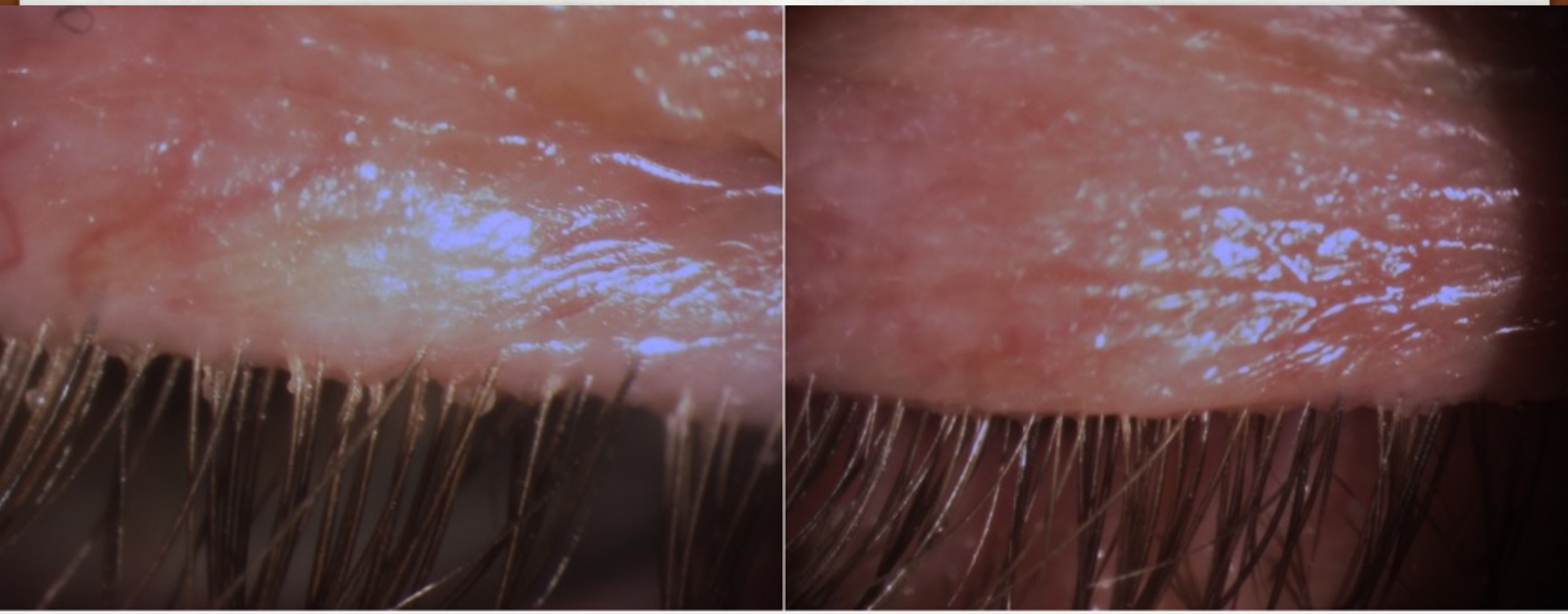
- Blephex
- Instill a drop of Tetravisc
- Soak! (saturate) tips in Blephex solution
- It should be foamy as you go
- Use a new tip for each lid
- Work along lash line and lid line over meibomian gl
- Push harder if it tickles too much
- Do touch up behind the slit lamp
- Use gloves
- Rinse thoroughly after

DEMODEX BLEPHARITIS

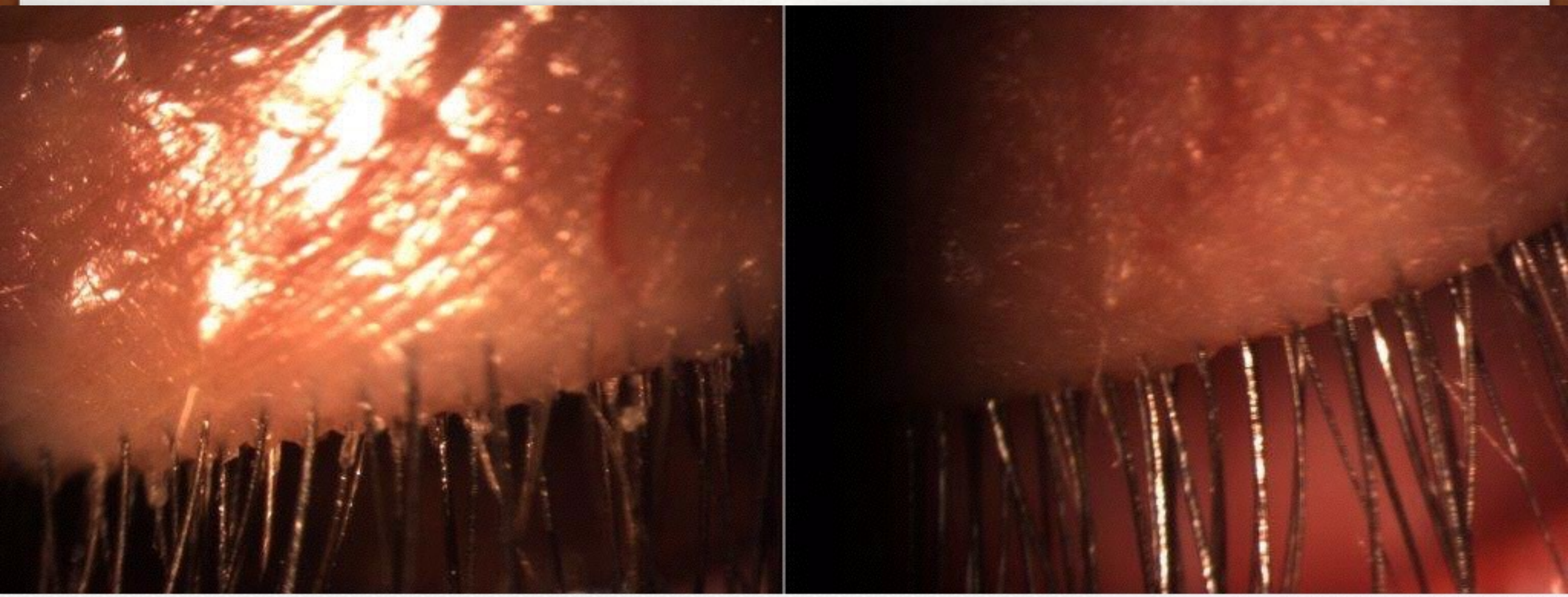
BLEPHEX BY RYSURG

Push the button once to start,
again to
switch directions, and again to
turn
off. Work the base of the lashes
and the lid margin. Check your
work
at the slit lamp and can touch up
there. CD can be stubborn.

BLEPHEX, BEFORE AND AFTER



BLEPHEX, BEFORE AND AFTER



EVIDENCE-BASED PROCEDURES

- *Read the research to support your treatment decisions*

THE RESEARCH

LIPIFLOW

CONCLUSIONS: A single VTP treatment can deliver a sustained mean improvement in meibomian gland function and mean reduction in dry eye symptoms, over 12 months. A single VTP treatment provides significantly greater mean improvement in meibomian gland function and dry eye symptoms as compared to a conventional, twice-daily, 3-month regimen. Early VTP intervention for meibomian gland dysfunction is associated with improved treatment outcomes.

The sustained effect (12 months) of a single-dose vectored thermal pulsation procedure for meibomian gland dysfunction and evaporative dry eye Blackie CA, Coleman CA, Holland EJ Clinical Ophthalmology. 2016 Jul;2016(10):1385–1396.

THE RESEARCH

MASKIN PROBING

CONCLUSIONS: **Intraductal meibomian gland probing seems to improve meibomian gland lipid levels, and it may be a good treatment option for cases of o-MGD that are resistant to conventional treatment.**

Analysis of Meibum Before and After Intraductal Meibomian Gland Probing in Eyes With Obstructive Meibomian Gland Dysfunction Nakayama, Naohiko MD; Kawashima, Motoko MD, PhD; Kaido, Minako MD, PhD; Arita, Reiko MD, PhD; Tsubota, Kazuo MD, PhD

Cornea. 2015 Oct;34(10):1206-8

THE RESEARCH

DEBRIDE SCALE

CONCLUSIONS:

The debridement-scaling of the LOM and lower lid margin provides statistically significant symptom relief and improvement in the MG function. The novel procedure should be considered in the management of MGD and evaporative dry eye.

Debridement-scaling: a new procedure that increases Meibomian gland function and reduces dry eye symptoms.
Donald R. Korb, Caroline A. Blackie
Cornea. 2013 Dec; 32(12): 1554–1557. doi: 10.1097/ICO.0b013e3182a73843

THE RESEARCH

MANUAL EXPRESSION

- Gifford SR. Meibomian glands in chronic blepharoconjunctivitis. Am J Ophthalmol 1921; 4:489494.
- McCulley JP, Sciallis GF. Meibomian keratoconjunctivitis. Am J Ophthalmol 1977; 84:788793.
- Korb DR, Henriquez AS. Meibomian gland dysfunction and contact lens intolerance. J Am Optom Assoc 1980; 51:243251.

"It has been known for over 150 years that treatment for MGD/obstruction to be optimally effective the stagnated contents of the glands must be evacuated. Until recently, the only known method to evacuate stagnated gland contents has been to manually express the glands using physical force. This procedure although effective is also extremely uncomfortable. In fact, it has been reported that the primary limitation to efficacy of manual expression is pain." Caroline Blackie

IN-OFFICE LID TREATMENTS

PATIENT AND PRACTICE BENEFITS

- Higher level of care
- Distinguish your practice
- Has a cash pay component immune to downward pressure from insurance
- Provides symptomatic relief for patients
- Proactive is better than reactive
- Prevalence of ocular surface disease is increasing as our patients' vision demands increase

IN-OFFICE PROCEDURES

PRACTICE PEARLS

- Use patient communication sheets
- (join ODs for Ocular Surface Disease on Facebook for resources)
- Recommend, check boxes, staff reviews with the patient
- Use anterior segment photos to explain their condition
- Show before and after Blephex pictures
- Follow back in 1 -2 months. 3 months is too long.
- Recommend at-home care and sell in your practice

SINCERE THANKS FOR YOUR ATTENTION

- QUESTIONS?

- SSCHACHTER@VISIONSOURCE.COM
- FACEBOOK: ODS FOR OCULAR SURFACE DISEASE