New Advancements in the Management of Ocular Surface Disease

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Ocular Surface Disease Health

- Discuss the associated pathology of dry eye
- Discuss modalities of diagnosis, etiology and predisposing factors
- Latest dry eye treatment options

Ocular Surface Disease

Dry Eye Disease

- 20 years since starting my first dry eye clinic
- 14 of those years were…. frustrating

Predisposing factors

- Age
- Gender
- Environment
- Anterior Segment Disease
- Medications
- CL Wear
- Refractive or cataract surgery
- Systemic Disease
Gender

- Sjogren’s: Dry eye is characterized by a triad of dry eye, dry mouth, and associated auto-immune disorders
- Prevalence
  - 0.4%
  - 85% women

Prevalence of Dry Eye (continued)

Prevalence by Age and Gender – WHS Study

Environment

- Air conditioners or heaters
- Airline travel
- Winter months, allergy season
- Ceiling fan
- Exogenous irritants (smoking)
- Reading time/Computer
LID MARGIN DISEASE: MGD

Frothy / Foamy Tears = MGD

Video of MG Expression
Key Components to MGD*

Obstruction

Inflammation

Biofilm development

Tear film instability/hyperosmolarity

* Not present in all cases

Obstruction: Debridement-Scaling

- Debridement-scaling of the line of Marx and keratinized lid margin improves MG function and reducing symptoms


Video of lid debridement

Warm Compress Effectiveness


- Effective: Requires continuous heat and temperature
- Commercial compresses (e.g. Bruder) favored especially if they can provide hydration
Bruder Eye Hydrating Compress

Moist heat compress
30 angstrom opening pulls
in ambient hydration and
then release
20-25 seconds in
microwave
Brings MG temperature
over 104 degrees for ~10
min
Antibacterial via silver
ionization
Washable, durable

Patented MediBeads Technology

Thermal Pulsation: LipiFlow

- Conclusion: Single 12 minute procedure statistically improved MG secretions, TFBUT and OSDI at 9 months
THERMODYNAMIC TX TO EXPRESS AND EVACUATE MGs
A new thermodynamic treatment to express & evacuate the MGs

Heat applied to both inner lid surfaces
Pulsatile pressure applied to outer lids

The device applies controlled heat to the inner upper and lower palpebral conjunctival surfaces and lid margins, while simultaneously applying pulsating pressure over the upper and lower (outer) eyelids.

THE LIPIFLOW
(TearScience Inc., Morrisville, NC)

FDA approved LipiFlow July 2011

LipiFlow® Thermal Pulsation

LipiFlow® is the only FDA-cleared device for Meibomian Gland Dysfunction (MGD), shown to restore gland function.

LipiFlow® is an in-office procedure, taking only 12 minutes per eye.

Thermal Pulsation: LipiFlow


- Review of 31 peer-reviewed reports on vectored thermal pulsation therapy at the time of the search (eight manuscripts and 23 meeting abstracts)

- Effective: Optimal temperature for entire time, back surface, simultaneous expression
**LipiFlow - Large Multicenter RCT**

12-Month Cohort with One Thermal Pulsation Treatment

For Treatment group subjects who received only one thermal pulsation treatment, a sustained mean improvement in dry eye symptom score was observed from Baseline (44.1 ± 20.4) to 12 Months (21.6 ± 21.3) (p<0.0001)

**Treating the Biofilm**

Lid hygiene products

Canister options seem to work well

Surfactant and hypochlorus acid versions

Mechanical with surfactant cleaner (e.g. Blephex)

**Video of Blephex**

**The Cycle of Inflammation**

- Stasis, inspissation and obstruction of the Meibomian Glands
- Meibomian Gland Dysfunction (MGD)
- Decrease in Meibomian secretions
- Decrease in tear film stability, increased aqueous tearing
- Increase in evaporative stress
- Ocular surface exposure (between blinks) & Micro-trauma (during blinking)
- Inflammation
- Potential Long-term Damage
- Tissue Changes

### Inflammation and MGD

- Enríquez-de-Salamanca A1, Castellanos et al. Tear cytokine and chemokine analysis and clinical correlations in evaporative-type dry eye disease. Mol Vis. 2010 May 19;16:862-73

### Inflammation in MGD

Combination agents vs. steroid agents
- Topical AzaSite
- Cyclosporine (Restasis)
- Lifitegrast (Xiidra)
- Omega fatty acids
- PO doxycycline or azithromycin

### Clinical Research on Corticosteroids in MGD


### Clinical Research on Cyclosporine and MGD

Prabhasawat P, Tesawibul N, Mahawong W. A randomized double-masked study of 0.05% cyclosporine ophthalmic emulsion in the treatment of meibomian gland dysfunction. Cornea. 2012 Dec; 31(12):1386-93

Conclusions: OSDI, TFBUT, lid margin inflammation, meibomian gland expressibility, and tarsal injection showed significant improvement from baseline in group A (P<0.01, P<0.05, and P<0.001, respectively). In group B, only the OSDI improved significantly from baseline at 3 months (P=0.003).
Clinical Research on Cyclosporine and MGD


Reviewed MGD and cyclosporine data in MGD as favorable
Perry H, Doshi-Carnevale S, Donnenfeld E et al. Efficacy of Commercially Available Topical Cyclosporine A 0.05% in the Treatment of Meibomian Gland Dysfunction, Cornea, 2006;25:171–175

At the 3-month visit, statistical improvements (p< 0.05) in lid margin vascular injection, tarsal telangiectasis, and NaFl staining. Most significant finding (P = 0.001) was the greater decrease in the number of meibomian gland inclusions in the tCsA group compared with the placebo group.

Mild MGD

- Hydrating hot compresses
- Lid hygiene/Lid scrubs
- Lipid based tears
- Omega fatty acid supplement or topical cyclosporine/lifitegrast

Clinical Research on Cyclosporine and MGD

Rubin M, Rao S. Efficacy Topical Cyclosporine 0.05% in the Treatment of Posterior Blepharitis, Ocular Pharmacology and Therapeutics. Nov 2006: 22 (1)

Conclusions: Comparison of Cyclosporine to Tobradex for MGD after 12 weeks: greater improvements in Schirmer's scores (P < 0.001) and TBUT(P = 0.018) than tobramycin/dexamethasone

Mean improvement in meibomian gland secretion quality was significantly greater with cyclosporin (P = 0.015).

Higher percentage of patients in the cyclosporin treatment group had improvements in symptoms of blurred vision, burning, and itching and more cyclosporin-treated patients experienced resolution of lid telangiectasia

Moderate anti-inflammatory: Begin with:

- Loteprednol or loteprednol + tobramycin
- Tobramycin + dexamethasone
- Neosporine + dexamethasone
- Azithryomycin drops
- Loteprednol ung or FML ung QHS
Moderate/Severe MGD

- Thermal pulsation (+ hydrating compress)
- Blephex biofilm treatment in office
- Osmolarity lowering tears such as TheraTears, Blink or Oasis Plus
- Oral doxycycline/azithromycin + steroid combination agents, topical steroids

Long Term

- Hydrating compress daily
- Lid hygiene daily- foam canisters
- Pulse dose medications periodically
- Lifitegrast or Cyclosporine BID
- Essential fatty acid supplements
- Pulsed topical corticosteroids for flare ups
- AT’s PRN (e.g. RetainMGD)

Severe: Potential Chronic Changes

- Telangiectasia
- Dislocation of meibomian glands/ gland atrophy
- Scarring

Severe or not improving

- Add PO tetracycline
- Recommendation:
  - Doxycycline 50mg bid x 4-8 weeks then taper to qd
  - 5 Day Z-Pac
  - Omega fatty acids
Thank You