Course #

107

Marginal Lids and the Ocular Surface
Marginal Lids and the Ocular Surface

(A Simplified Cookbook Approach)

COPE Course ID:

SECO 2015

Marginal Lids and the Ocular Surface

Finally……Something I can use.

Dr. Gilbert D. Spindel, Jr., OD, FAAO
Chief Optometrist
DigitalVision, L.L.C., Atlanta, GA
Chief Optometrist, United States Federal Penitentiary, Atlanta, GA

GDSpindel@mindspring.com
C: 404-310-0687

DISCLOSURE STATEMENT

The content of this course was prepared independently by Dr. Gilbert D. Spindel, Jr., OD, FAAO, without input from the ophthalmic or pharmaceutical industry.

Dr. Spindel has no direct financial interest in any companies, products or services mentioned in this presentation.

Course Title:
Marginal Lids and the Ocular Surface

Please silence all mobile devices
At the conclusion of this course, please properly dispose of your trash as you leave this room.

Observe the Signs,
….but don’t overlook the obvious!

Clinical Issues
we see every day.

.............when we look!

Tear
Big deal. After all, it’s just water!

........or is it?

Healthy Tears

• A complex mixture of proteins, mucin, and electrolytes
  • Antimicrobial proteins: Lysozyme, lactoferrin
  • Growth factors & suppressors of inflammation: EGF, IL-1RA
  • Soluble mucin SAC secreted by goblet cells for viscosity
  • Electrolytes for proper osmolarity

Image adapted from: Dry Eye and Ocular Surface Disorders.

Stern et al. In: Dry Eye and Ocular Surface Disorders.
What Is a Healthy Tear Film and Ocular Surface?

- In a healthy ocular surface, the tear film:
  - Is uncompromised
  - The epithelial cells are hydrated and in osmotic balance
  - Provides maximum comfort

Tears in the Chronic Dry Eye

- Decrease in many proteins
- Decreased growth factor concentrations
- Altered cytokine balance promotes inflammation
- Soluble mucin 5AC greatly decreased
  - Due to goblet cell loss
  - Impacts viscosity of tear film

Minimal Disruption of the Ocular Surface can Severely Degrade Visual Acuity

Lipid Secretion: Meibomian Glands

- The lipid layer restricts evaporation to 5-10% of tear flow
  - Also helps lubricate
- Obstruction of meibomian gland ducts reduces lipid secretion
  - Causes increased evaporation of the aqueous component

Mucin Secretion: Goblet Cells

- 5-20% of conjunctival epithelial cells are mucin-producing goblet cells
- Soluble mucins essential for viscosity and stability of normal tear film
  - Helps resist thin spots and tear break-up

Ocular Surface Disease and Advanced Technology

- Quality of vision starts with a healthy tear film.
- All of the recent advances in cataract and refractive technology are lost with even minimal disruption of the ocular surface.
The Tear Film is the Most Important Refracting Surface of the Eye

Ocular Surface Disease is Markedly Under-Diagnosed

- There are an estimated 55 – 90 million Americans with dry eye disease. Most of them are elderly.
- Over 80% of dry eye sufferers may not have been diagnosed by an eye care professional.

Blepharitis

- Blepharitis is the most common, most difficult and arguably the most important diagnosis presenting to the eye care professional.

Lid Margin Disease — Definitions

- **Anterior Blepharitis**
  - Inflammatory condition of outside portion of the eyelids
  - Often secondary to infection, or associated with acne rosacea or seborrheic dermatitis of the scalp or facial areas
- **Meibomian Gland Disease (MGD; Posterior Blepharitis)**
  - Tissue inflammation of the inside portion of the eyelids
  - Associated with altered composition of the meibomian gland secretions, inflammation of local tissue

Anterior Blepharitis

- Inflammation of the eyelids usually caused by bacterial infection (staphylococcal) of the eyelid margin
- Infection normally occurs at the origins of the eyelashes and involves the lash follicles and the meibomian glands
- Signs and symptoms include:
  - Morning crusting of lids
  - Loss of lashes
  - Collarettes - scales that encircle the lashes
  - Lid margin redness
  - Conjunctival hyperemia

Sequelae to Blepharitis

- Chalazia / hordeola
- Dry eyes
- Punctate keratitis
- Pannus
- “Recurrent conjunctivitis”
- Phlyctenules
- Corneal ulceration
- Endophthalmitis
Increased Risk for Endophthalmitis
- Patients’ external tissues are an important source of infecting organisms that adversely affect surgical outcomes (Speaker, 1991)
  - Endophthalmitis results from patients own lid and surface flora
  - Surgical outcome adversely affected by inflammation and dysfunctional tears
  - Procedures must be postponed/cancelled due to status of lid margin

Anterior Lid Margin
- Anterior blepharitis most commonly due to Staphylococcal infection.

Common Signs and Symptoms, ...............when we look and listen!
- Morning crusting with foreign body sensation
- Recurrent hordeola and or chalazia
- Loss of lashes
- Conjunctival hyperemia
- Collarettes - scales that encircle lash
- Staphylococcal immune disease
  - Inferior conjunctival and corneal punctate keratopathy/Pannus
  - Catarrhal infiltrates

Most Common Treatments may be a combination of:
- Lid hygiene with hot compresses
- Commercial lid scrubs and/or baby shampoo
- Antibiotic ointment to lid margin
  (Bacitracin, Erythromycin, TobraDex)
- Corticosteroids for persistent inflammation and corneal/conjunctival immune sequelae

Posterior Lid Margin Disease
- Clinical Findings
  - Posterior Lid margin
  - Inspissation of glands
- Erythema & telangiectasia
- Pouting of oil

- Gland drop out (easily observed with transilluminator)
- Rapid tear break up time
Pathophysiology of Meibomian Gland Disease

- Normal meibomian gland secretions convert from unsaturated lipids that melt at body temperature to saturated fats that inspissate the meibomian glands.
- Lid bacteria secrete lipases that break down lipids to soaps and fatty acids.

Again, common Signs and Symptoms, ...............when we look and listen!

- Burning, foreign body sensation with dry eye symptoms (contact lens intolerance)
- Filmy vision with foam in tear film (soaps and fatty acids)
- Dilated meibomian gland orifices with plugged “toothpaste” like material
- Chalazia
- Thickened lid margin

Inadequate Tear Film Lipids Causes Evaporative Dry Eye

Bacterial Lipases Breakdown Lipids to Soap

Meibomian Gland Disease (Dysfunction)

- Involves a change in composition of meibomian gland secretions, inflammation, irritation and an altered tear film
- Signs and symptoms include:
  - Dilated & plugged meibomian gland orifices with “toothpaste” like material
  - Dry eye signs and symptoms (burning, foreign body sensation, contact lens intolerance)
  - Thickened lid margin
  - Filmy vision with foam in tear film (soaps/fatty acids)

Common Treatment Options

- Lid Hyperthermia (Hot Compresses)
- Antibiotic and corticosteroid ointments
- Oral Tetracycline family antibiotics for chronic or severe disease, especially with facial involvement
  - Doxycycline 100 mg bid x 1 mo, then 20-40mg/day
- Nutritional supplements - Omega 3 FA’s – (Flaxseed and Fish Oil)
- Topical Cyclosporine 0.05% bid
- Topical Azithromycin
- Topical AT’s (w/sodium Hyaluronate)
Nutritional Supplements

- Short-chain Omega-3s = **Flaxseed Oil**
- Long-chain Omega-3s = **Fish Oil**

**How Much:** 1-3 gm qd?

**Which Kind:** Triglyceride/ EE ??

**Flaxseed Oil & Fish Oil**

- **Flaxseed Oil** thins meibomian gland oils and thickens the oil layer, but does not suppress inflammation.
- **Fish Oil** suppresses inflammation, but does not thicken the oil layer.
- **Flaxseed Oil** and **Fish Oil** work together synergistically to stimulate tear and salivary gland secretion.

Flaxseed Oil Augments Oil Layer

- Essential fatty acids provide the raw material for the production of meibum, and
- Omega-3s affect the lipid profiles of meibomian gland secretions in Sjögren’s patients. (HPLC/mass spectrometry studies). (Sullivan BD et al 2002)
- **Flaxseed oil** omega-3s treatment produces clearer and thinner meibomian oils. (Boemer CF 2000)
- **Flaxseed oil** treatment thickens the oil layer. (Chan CCK, Boxer Wachler BS 2006)

Cyclosporine A Treatment of Blepharitis

- Topical Cyclosporine A in the treatment of meibomian gland dysfunction:
  - Cyclosporine 0.05% b.i.d.
  - Significant improvement in meibomian gland inclusions, tarsal telangiectasia, and corneal staining.


Blepharitis Pathophysiology: The Problem with Current Therapy

- Lid bacteria and inflammation play an important role in both anterior and posterior blepharitis
  - Ointments penetrate poorly into lid tissue,
  - Drops have minimal contact time to the lid margin
    and the MIC may be low for most meds,
  - Oral therapy has reduced tissue levels and systemic side effects,
  - Long term corticosteroids are impractical and can potentially cause ocular side affects (IOP, Cats??)

Anti-Inflammatory Effects of topical and/or systemic Azithromycin

- Anti-inflammatory effects which are dose dependent and independent of their antimicrobial effect (Lanaro 2000)
  - Reduce migration of neutrophils (Takeshita 1989)
  - Reduce production of pro-inflammatory cytokines (Hand 1990)
  - Phagocytosis (Kono 1994)
  - Anti-oxidant characteristics (Labro 1989)
Azithromycin: Ideal for Blepharitis

- Broad-spectrum: active against most common bacteria responsible for blepharitis
- High tissue penetration
  - Topical ophthalmic dosing results in sustained high levels in tear film, lid margin, and conjunctiva
- DuraSite is an adhesive matrix that stabilizes small molecules like azithromycin and increases its bioavailability in tissue

1 Zithromax [prescribing information] New York, NY, Pfizer, 2007
2 Data on file, Inspire Pharmaceuticals Inc., NDA Summary Clinical Efficacy

Conclusion

- Visual acuity and quality of vision all start with the tear film.
- Improving the tear film is documented to significantly improve visual outcomes in patients undergoing conventional and advanced technology IOL & cataract surgery as well as LASIK, SBK and PRK (ASA).

Lid Compresses (opens the meibomian glands)
Azithromycin (lowers the melting point of MB plugs)
Cyclosporin (helps the lacrimal gland produce real tears)
AT’s w/ sodium hyaluronate
Omega 3’s (improves oil layer & acts as an anti-inflammatory)
Hydroxypropyl cellulose (chronic dry eyes)
Punctal plugs (in extreme cases)
Adjunct lifestyle changes (stop smoking)
and nutritional therapy

and as promised…………………

the Cookbook:

1. Lid Compresses:
   - Use after you wash your hands
   - Keep clean your own kit
   - Heat your own kit (for 30-60 seconds)
   - Gently apply the tip of the tube (2 drops)
   - Repeat every 24 hours

2. Aredri:
   - Make sure you’re not dry
   - Put one drop on the end of your finger
   - Gently apply along the base of the upper lash line
   - You can use this for 2 days

3. Rotastim:
   - Keep your tube of kit in the refrigerator
   - In the morning open one stick, insert one drop in each eye
   - In the evening (1) fresh tube (insert) another drop
   - Repeat each morning & each evening
   - Continue 6-9 months

4. FreshBlink (or Blink Tonic):
   - Close the counter
   - Use 1 gq drop per day, 4-8 times per day, as needed

5. Omega 3’s:
   - Close the counter
   - Use 1 capsule per day
   - Use 1 capsule per day

6. LacriCort:
   - Insert in the morning, one cap per day, as necessary

7. Hydroxyprogesterone:
   - 4 capsules every day in the morning

GDSpindel@mindspring.com
C: 404-310-0687

Dr. Gilbert D. Spindel, Jr., OD, FAAO
Chief Optometrist
DigitalVision, LLC, Atlanta, GA
Chief Optometrist, United States Federal Penitentiary, Atlanta, GA

Dr. Gilbert D. Spindel, Jr., OD, FAAO
Chief Optometrist
DigitalVision, LLC, Atlanta, GA
Chief Optometrist, United States Federal Penitentiary, Atlanta, GA
GDSpindel@mindspring.com
C: 404-310-0687

Thank you