Ocular Surface Society of Optometry: Evaluation, Diagnosis, and Treatment Strategies-OSD work up, Lid Disease, and the Business of Dry Eye

Dr. Jack Schaeffer

The OSD Wellness Initiative

- Pre Screening
- Diagnosis
- Treatment
- Patient Education

The OSD Wellness Initiative

- Preventive Medicine
  - Dermatology
  - Dentistry
  - Psychology (behavior modification)

The OSD Wellness Initiative

- OD’s
  - Need education
  - Staff Training
  - Change the culture
  - Inform the Public

- I Care

Conjunctival Staining

- Moderate / Severe lissamine green staining
Nocturnal Lagophthalmos?
Lid Disease

We cannot treat the dry eye until we understand and treat

LWE
MGD
Blepharitis
Epiphora

IT IS ALL ABOUT THE LIDS

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 lash
  - Lid margin redness
  - Conjunctival hyperemia

Diagnosis

- Exclusion
- Cylindrical Dandruff
- Microscopic evaluation of Cilia base

Demodex

- Cliradex
- Ocusoft Demodex Kit
- Tea tree Oil : 50%
- BlephEx

Treatment Goals for Anterior Blepharitis Patients

- Antibiotic
- Antibiotic / steroid combination
- gtts
- Ung
- BlephEx
- BlephSteam
- Doxycycline
- Lid scrubs / Ocusoft cliradex
- Mineral or Coconut Oil
Baby Shampoo.....really a myth

It is the traditional method taught in school but is has disadvantages which include:

• Requires Mixing and Diluting (Convenience?)
• Poor Patient Compliance (actually is irritating to eye)
• Long Term Use Will Make the Skin Dry
• More Professional Treatments are Available
• Using soaps on soap producing Meibomian glands

Meibomian Gland Dysfunction

• The TFOS Report of the International Meibomian Gland Dysfunction Workshop
  – Etiologies
  – Definition/ Classification
  – Epidemiology
  – Clinical characteristics
  – Diagnosis/ Management
  – Contact lenses, surgical implications

Dry Eye and MGD

MGD is the most common cause of evaporative dry eye.
Anatomy, Physiology and Pathophysiology of the Meibomian Gland

Erich Knop, M.D., Ph.D. (Chair)
Nadja Knop, M.D., Ph.D.
Thomas J. Miliar, Ph.D.
Hiroto Obata, M.D.
David A. Sullivan, Ph.D.

Meibomian Gland - ANATOMY

- Length
  - Follows the tarsus
- Number
  - More in upper lid (30-40)
  - Less in lower lid (20-30)
- Volume
  - Higher in upper lid (26µl vs. 13µl)
  - Relative functional contribution (upper vs. lower) to the tear film lipid layer is unknown

Meibomian Gland – PATHOLOGY

- Obstructive MGD leads to a progressive ductal DILATATION and acinar ATROPHY

Meibomian Gland Dysfunction

Definition & Classification

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Jun Shimazaki, M.D., Ph.D. (Co-Chair)
Jose M. Benitez-del-Castillo, M.D., Ph.D.
Jennifer Craig, Ph.D., MCOptom
James P. McCulley, M.D.
Seika Den, M.D., Ph.D.
Gary N. Foulks, M.D.

Classification of MGD
Epidemiology and Associated Risk Factors of Meibomian Gland Dysfunction

Debra A. Schaumberg, Sc.D., O.D., M.P.H. (Chair)
Jason J. Nichols, O.D., M.P.H., Ph.D.
Eric B. Papas, M.Sc., O.D., Ph.D.
Louis Tong, F.R.C.S., M.B.B.S.
Miki Uchino, M.D.
Kelly K. Nichols, O.D., M.P.H., Ph.D.

Evaluation, Diagnosis and Grading of Severity of Meibomian Gland Dysfunction

Alan Tomlinson, MCOpt, Ph.D. (Chair)
Anthony J. Bron, F.R.C.S.
Donald R. Korb, O.D.
Shiro Amaro, M.D., Ph.D.
Kelly K. Nichols, O.D., M.P.H., Ph.D.

Stages of MGD

Management and Therapy of Meibomian Gland Dysfunction

Gerd Geering, M.D. (Chair)
Terrence O’Brien, M.D.
Joseph Tsauber, M.D.
Christophe Baudouin, M.D., Ph.D.
Eiki Goto, M.D.
Yukihiro Matsumoto, M.D.
Kelly K. Nichols, O.D., M.P.H., Ph.D.

Current Practice Patterns*

- Lid hygiene, warm compresses and lid massage
  - Cleaning of the lid margin with baby shampoo, cotton buds or wet towels, daily for 5-15 minutes
  - Lubricants in cases with additional dry eye
  - Topical antibiotic oint (moderate to severe)
  - Systemic tetracyclines/derivatives in recurrence
  - Incision and curettage with optional steroid injection in chalazion

*Excerpted from Moorfields Manual, Wills Eye Manual (Guidelines for posterior blepharitis and meibomitis)
WHY A NEW PARADIGM?

Dry Eye has remained an enigma

“As anomalous results build up, science reaches a crisis, at which point a new paradigm, which subsumes the old results along with the anomalous results into one framework, is accepted.”

Thomas S. Kuhn, 1962
The Structure of Scientific Revolutions

DISRUPTIVE CONCEPTS

Meibomian gland dysfunction may be the leading cause of dry eye syndrome throughout the world
(Tear Film and Ocular Surface Society (TFOS), 2008 – 2010)

Aqueous and lipid deficient dry eye may not be distinguishable: Low Schirmer score and thin-low lipid layer thicknesses coexist

The phenotypes of evaporative dry eye and aequous dry eye take on the form of each other

The most frequent form of MGD, obstructive MGD, frequently presents without obvious signs (Nonobvious MGD (NOMGD))

Structure of the Lipid Layer

Non-Obvious MGD (NOMGD)

- MGD may be nonobvious without inflammation and without other obvious signs (NOMGD)
- NOMGD may be precursor to obvious MGD
- Highly prevalent and under-diagnosed – may be most common cause of evaporative eye disease
- In a recent dry eye study of the 52 subjects that had MGD, 48% of them had NOMGD.
Treatment of MGD/NOMGD

At Home Therapy
- Warm compresses
- Eyelid Scrubs
- Self expression

In-Office Therapy
- Manual Expression
- Off-Label Pharmacotherapy
  - Oral tetracycline/doxycycline
  - Topical Antibiotics – erythromycin, tobramycin
  - Topical Steroids – dexamethasone

Meibomian Gland Evaluator™ (MGE)

- The TearScience® Meibomian Gland Evaluator
  - Applies consistent, moderate pressure
  - Between 0.8 g/mm² and 1.2 g/mm²
  - Allows evaluation of secretions from

<table>
<thead>
<tr>
<th>Grade</th>
<th>Secretion Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Clear liquid oil</td>
</tr>
<tr>
<td>2</td>
<td>Colored/cloudy liquid</td>
</tr>
<tr>
<td>1</td>
<td>Inspissated (toothpaste consistency)</td>
</tr>
<tr>
<td>0</td>
<td>No secretion (includes capped orifices)</td>
</tr>
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LipiFlow® Offers a Solution for Patients With MGD

- Activator
  - Applies intermittent heat to inner eyelid
  - Inflatable air bladder
  - Insulated lid warmer shields eye from heat and vaults above the cornea to prevent corneal contact

- Lid warmer
  - Applies directional heat to inner eyelid

- Heats comfortably to liquefy the Meibomian gland contents

- New! Ophthalmic Surgical Instruments
  - Collins Expressor Forceps (Item 98610)
    - For aggressive expression of the Meibomian gland.
  - Livengood Expressor Paddles
    - Angled (Item 98620) & Flat (Item 98630)
      - For mild or gentle expression of the Meibomian gland.

Maskin Expressor

- $575
- Rhein Medical
Bruder Eye Hydrating Compress and Stye Compress conveniently provide an effective yet natural and drug-free way to help provide and maintain proper eye moisture.

**Benefits**
- Replenishes Moisture Naturally
- Relieves Dryness
- Relieves Tired Eyes
- Provides Drug Free Relief

**Features**
- Ready in Minutes from the Microwave
- Naturally Hydrating
- Washable & Reusable
- Clean Moist Heat
- Soft Conforming Design
- Non-Allergenic
- Dust-Free

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**WARNING**
- Hot compresses can change the corneal tissues and structure
- Possible Link to Keratoconus
- Evidence Based Medicine

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**Maskin Probe**

1) $158 box (10)  
2) 1,2,4,6 MM intraductals  
3) Aluminum Handle $104

**Maskin Tube**
Meibomian gland Drug delivery system

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**Maskin Probe**
Leiter Pharmacy  
8% lidocaine with 25% Jojoba in ung base

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**Sjogren’s Syndrome**
- Lymphocytic infiltration of lacrimal and salivary glands  
- 0.4% prevalence  
- Women > Men (younger women)  
- Much lower androgen counts  
- Treat underlying immune disorder
## 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

## Sjogren’s Syndrome

- **Medical Treatments: Secretagogues**
  - **Salagen 5 mg**
  - **Pilocarpine tablets**
  - Avoid in asthma patients, GI ulcer, acute iritis or narrow angles
  - **Evoxac 30 mg TID**– saliva stimulating drug
  - Very effective with a lot less side effects

## Overview and Summary

**Recent Clinical Findings**

- The disease can present alone, classified as primary Sjögren’s, or subsequent to another autoimmune condition (e.g. rheumatoid arthritis), which is classified as secondary Sjögren’s.
- Sjögren’s is one of the most common autoimmune diseases.
- It currently takes 4.7 years to receive an accurate diagnosis.
- While the immune response is largely directed to the exocrine glands (lacrimal and salivary), systemic effects are seen in 30-70% of patients.

## Traditional Serological Disease Markers for Sjögren’s

- The classical serological markers for Sjögren’s are anti-Ro/SS-A and anti-La/SS-B antibodies.
- Other antinuclear antibodies (ANA) and rheumatoid factors (RF) are also included as the more common serological markers detected.
- The combined serology sensitivity and specificity of the classical markers is around 40-60%.
- None of the currently recommended serology tests diagnose Sjögren’s early in the disease progression.
- In approximately 20-30% of cases no classic Sjögren’s antibodies are found.

## Traditional Understanding of Sjögren’s

- The disease can present alone, classified as primary Sjögren’s, or subsequent to another autoimmune condition (e.g. rheumatoid arthritis), which is classified as secondary Sjögren’s.
- Sjögren’s is one of the most common autoimmune diseases.
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## Clinical Presentation of Sjögren’s

**Myth:** “There are only a few patients in my practice”

- All layers of the tear film may be affected since Sjögren’s is a chronic, progressive disease.
  - Patient evaluation should include:
    - Medical and ocular history
    - Tear volume
    - Tear film distribution and stability
    - Clearance of the tear film

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Disease progression can vary, so prognoses can also vary. As the disease progresses, debilitating fatigue and joint pain may remain stable, worsen or improve in cycles. Symptoms range from mild dry eye/mouth to severe organ damage and/or lymphoma. Early detection and treatment may assist in preventing complications. However, it currently takes 4.7 years to receive an accurate diagnosis.

Sjögren’s Syndrome

Sjögren’s syndrome is currently defined by:
- Ocular symptoms – dry eyes
- Oral symptoms – dry mouth
- Oral signs – abnormal Schirmer’s test or Rose Bengal or Lissamine Green staining
- Oral signs – decreased salivary gland flow
- Metapathology showing lymphocytic infiltration of salivary or lacrimal glands
- Autoantibodies – anti-Ro and/or anti-La, ANA, RF

Other manifestations include:
- Lung disease – usually a lymphocytic interstitial pneumonia
- Kidney disease – usually mild tubular disease, but may have glomerular disease
- Peripheral neuropathy
- Vascular involvement in skin, bowel, muscle, nerve and occasionally other organs
- Vascularopathy, especially with secondary anti-endothelial antibodies
- 5% of patients develop non-Hodgkin lymphomas

Systemic involvement in Sjögren’s syndrome may lead to:
- Respiratory dysfunction
- Renal dysfunction
- Lymphoma

Early Diagnosis/Intervention for Sjögren’s

Ocular symptoms are frequently the first to present in patients with Sjögren’s, enabling ECP’s an opportunity to identify disease before systemic development. Early diagnosis and treatment may delay the progression of disease. Active research is ongoing for additional therapeutic options for Sjögren’s.

Filamentary Keratitis

- 62 yo female
- VA 20/200
- Pain OU 2 years
- Third doctor in 2 years
- AT prn
Filamentary Keratitis
- Debridement of filaments
  - Iris forceps
  - 5 office visits
  - Weekly

Filamentary Keratitis
Medications: week 1
- Lotemax
  - Qid
- Refresh Ung
  - Pm
- PF AT
  - Q 1 hour

Filamentary Keratitis
- Month 2
  - Restasis tid
  - PF AT q 1 hour
  - PF UNG pm

Month 3
- Lacriserts am/pm
- Restasis
  - (consider Bandage Contact lens)

- Punctal Plugs
- Mucomist
- MGD treatment