The Tearing Patient

Melanie Ho Erb, M.D.

Clinical Instructor of Ophthalmology
USC, Keck School of Medicine
Clinical Instructor of Ophthalmology
University of California at Irvine

Objectives

- A systematic thought process to evaluate the tearing patient
- Common conditions which cause tearing
- Treatments for these conditions
The usual treatment

- Artificial tears
- Artificial tears more frequently
- Preservative free artificial tears
- Allergy eyedrop
- What then?

Systematic Thought Process

- Increase in tear production
- Decrease in tear drainage – functional
  - Can not get the tears into the properly working drainage system
- Decrease in tear drainage – anatomical
  - The drainage system does not work properly

Increase in tear production

- Eyelid margin disease
  - Blepharitis
  - Meibomianitis
  - Rosacea
  - Trichiasis/Distichiasis
  - Entropion of upper eyelid
- Allergic conjunctivitis/rhinitis
- Dry Eye
- Entropion of lower lid
Decrease in tear drainage - functional

Can not get the tears into the properly working drainage system
- Punctal malposition such as punctal ectropion
- Conjunctivochalasis
- Eyelid ectropion
- Eyelid laxity
- Cranial nerve VII palsy
  - Poor lacrimal pump function

Decrease in tear drainage - anatomical

The drainage system does not work properly
- Punctal stenosis
- Canalicular obstruction with or without canaliculitis
- Nasolacrimal Duct Obstruction with or without dacryocystitis
- Old facial trauma or sinus surgery
- Allergic rhinitis with inflammed nasal mucosa

Increase in tear production

- Eyelid margin disease
  - Blepharitis
  - Meibomianitis
  - Rosacea
  - Trichiasis
  - Entropion of upper eyelid
- Allergic conjunctivitis/rhinitis
- Dry Eye
- Entropion of lower eyelid
Anterior Lid Margin Disease - Blepharitis

Symptoms
- Morning crusting
- Foreign body sensation

Clinical Findings
- Collarettes - scales that encircle lash
- Telangiectasia on lid margin
- Loss of lashes, lash misdirection, lash growth from wrong orifices
- Conjunctival hyperemia
- Staphylococcal immune disease
  - Inferior conjunctival and corneal punctate keratopathy/Pannus

Blepharitis

Treatment
- Mechanical lid scrubbing with warm water
  - Or Dilute baby shampoo
  - Or Commercial lid scrubs
- Antibiotic/Steroid ointment (Tobradex or Maxitrol) to lid margin with massage to get inflammation under control
- Then change to Azasite to lid margin with massage into eyelids QHS for chronic control
- Chronic disease needs chronic control

Posterior Lid Margin Disease - Meibomianitis

Symptoms
- Burning
- Foreign body sensation
- Filmy vision

Clinical Findings
- Insipid meibomian gland orifices = dilated meibomian gland orifices with plugged "toothpaste" like material
- Erythema & telangiectasia
- Thickened lid margin
- Rapid tear break up time
- Foam in tear film (soaps and fatty acids)
Meibomianitis

Foam in tear film
Bacterial Lipases Breakdown Lipids to Soap

Meibomianitis

Treatment
- Warm compress and massage lid margin
- Antibiotic/Steroid ointment (Tobradex or Maxitrol) to lid margin with massage to get inflammation under control
- Then change to Azasite to lid margin with massage into eyelids QHS for chronic control
- Consider chronic oral Doxycycline for severe disease
  - Doxycycline 100 mg po bid x 4 weeks, then 50 - 100 mg/day

Eyelid Margin Disease

- Rosacea of face
  - Redness of cheeks, often subtle
  - Dermatology referral
- Rosacea of eyelids
  - Signs
    - Telangiectasia on lid margin
    - Eyelid inflammation
Eyelid Margin Disease

Rosacea of eyelids

Treatment
- Antibiotic/Steroid ointment (Tobradex or Maxitrol) to lid margin with massage to get inflammation under control
- Then change to Azasite to lid margin with massage into eyelids QHS for chronic control
- Consider Oral Doxycycline

Increase in tear production

Trichiasis
- Often occurs from long term eyelid margin disease
- Signs
  - Lashes touch globe
- Treatment
  - Epilation
  - Refer to oculoplastic surgeon for permanent lash removal

Increase in tear production

Entropion and trichiasis of upper lid
- Often occurs from long term eyelid margin disease, makes lid margin rotate toward cornea
- Signs
  - Lashes touch globe
- Treatment
  - Epilation
  - Refer to oculoplastic surgeon for permanent lash removal
**Increase in tear production**

- Allergic conjunctivitis and rhinitis
  - Symptoms
    - Itchy eyes
    - Tearing
    - Runny nose and/or sneezing
  - Signs
    - Follicles on palpebral conjunctiva
    - Conjunctiva may be injected or pale
    - Nasal mucosa is inflamed
    - Often signs are subtle

**Increase in tear production**

- Allergic conjunctivitis and rhinitis
  - Treatment
    - The big 3
      1. Oral non-sedating antihistamine: Claritin, Allegra, Zyrtec
      2. Topical steroid such as Pred Forte to get allergy under control
      3. Nasal steroid such as Flonase, Nasocort, Rhinocort
        Switch to allergy eyedrop such as Elestat for chronic use
        - Consider artificial tears to wash out allergens
        - Consider cold compresses to eyelids
        - Consider referral to Allergist

**Increase in tear production**

Dry Eye

- All tearing patients do not necessarily have dry eye
- Dry eye patients may tear, but not all tearing patients have dry eye
Increase in tear production

- Dry Eye
  - Symptoms
    - “Sand in eyes”
    - Foreign body sensation
    - Burning eyes
    - Tired eyes
    - Lids stick to eyeball
    - Pain
    - Blurred vision
    - Sometimes tearing

Dry eye

Tear Film: 3 components - Lipid, Aqueous, and Mucin

- Outer lipid layer prevents aqueous evaporation
- Secreted by meibomian glands
- Middle aqueous component - a complex mixture of proteins, mucins, electrolytes
- Secreted by main & accessory lacrimal glands
- Inner mucin provides viscosity to allow the tear film to spread over the ocular surface and allows stability during the blink cycle
- Secreted by goblet cells

Dry eye

- Abnormal tear film composition (such as from meibomianitis) may lead to decreased tear break up time which then leads to dry eye or keratopathy
Dry eye

- Causes of dry eye
  - Lid Margin Disease
  - Living in the Los Angeles desert
  - Contact Lens wear
  - Lasik
  - Inflammation to lacrimal gland from autoimmune diseases: sarcoidosis, Sjogrens syndrome, Thyroid eye disease
  - Medications: Acutane, antihistamines, beta blockers, diuretics
  - Decrease blink frequency: computer work, video games
  - Menopause

Dry eye

Signs
- Punctate keratopathy
- Corneal filaments
- Poor tear meniscus height
- Rapid tear break up time < 10 sec
- Poor shirmer test < 10 mm at 5 min with anesthesia
- Often signs are subtle

Dry eye

- Treatment
  - Artificial tears – Always good
    - Preserved
    - Preservative-free
    - Ointments
  - Restasis (cyclosporine) – for patients with an inflammatory lacrimal component
  - Punctal Plugs
    - Collagen
    - Silicone
    - No intracanalicular plugs please
  - Omega 3 Fatty Acids – Nutritional supplements
Restasis

- Topical Cyclosporine A
- Cyclosporine 0.05%
- 1 gtt ou bid
- RESTASIS® Ophthalmic Emulsion helps increase your lacrimal gland to produce tears which may be reduced by inflammation due to autoimmune diseases or from Chronic Dry Eye.

Omega 3 Fatty Acids – Nutritional supplements

- Short-chain omega-3s = Flaxseed Oil
- Long-chain omega-3s = Fish Oil

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.
Omega 3 Fatty Acids – Nutritional supplements

- Short-chain omega-3s = Flaxseed Oil
- Long-chain omega-3s = Fish Oil
- Both are available over the counter in form of gel caps

Increase in tear production

Dry Eye

- All tearing patients do not necessarily have dry eye

Increase in tear production

- Entropion of lower lid
  - Signs: Lashes touch globe
  - Treatment: Refer to Oculoplastic surgeon for surgical Transconjunctival Entropion Repair
First described by my partner Steven Dresner. Now widely used by many oculoplastic surgeons.

Addresses:
1. Horizontal eyelid laxity
2. Medial canthal ectropion
3. Orbicularis oculi tightness
4. Preseptal orbicularis myectomy


Transconjunctival Entropion Repair

- Excellent symmetry in unilateral cases
- Great lash projection
- Corrects the three main causal factors of involutional entropion

Decrease in tear drainage

Easiest test of drainage problems – anatomical or functional

- Dye disappearance test: place fluorescein in eye and evaluate if still plenty of fluorescein on eye in 5 minutes
- Excessive tear meniscus height
- Observe for frank epiphora
Decrease in tear drainage

- **Punctal ectropion**
  - **Signs**
    - Outward turning of medial eyelid margin and punctum
  - **Treatment**
    - Referral to oculoplastic specialist for surgical punctal ectropion repair

Decrease in tear drainage

- **Conjunctivochalasis**
  - **Signs**
    - Redundancy of conjunctiva (without chemosis) which may overlie the punctum, causing an obstruction to tear flow into punctum
  - **Treatment**
    - Surgical conjunctivoplasty

Decrease in tear drainage

- **Eyelid ectropion**
  - **Signs**
    - Outward turning of eyelid margin and punctum
  - **Treatment**
    - Referral to oculoplastic specialist for surgical ectropion repair
Decrease in tear drainage

Cranial nerve VII palsy

- **Symptoms**
  - Tearing
  - Pain

- **Signs**
  - Face droop
  - Weakness of muscles of facial expression
  - Punctal ectropion
  - Eyelid ectropion
  - Poor lacrimal pump function
  - Dry eye from exposure keratopathy from lagophthalmos

- **Treatment**
  - Tears, ointment at night, tape lid closed at night
  - Refer to oculoplastic surgeon for repair
  - May need temporary tarsorrhaphy
  - Ectropion repair
  - Punctal ectropion repair
  - Brow ptosis repair
  - Gold/platinum weight in upper eyelid for retraction and lagophthalmos
  - Intubation of nasolacrimal duct

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Decrease in tear drainage

- **Cranial nerve VII palsy**

- **Punctal stenosis**

  - **Signs**
    - Small, stenotic punctum
  
  - **Treatment**
    - Three snip punctoplasty
Decrease in tear drainage

- Canicular obstruction
  - Canaliculitis
  - Previous trauma
  - Previous surgery
  - Chemotherapy for cancer
  - Intracanicular plugs
    - Herrick plugs
    - Smart plugs

Decrease in tear drainage

- Intracanicular plugs
  - Herrick plugs
  - Smart plugs

- Canaliculitis
- Canicular obstruction
- A plea: please do not use!

Decrease in tear drainage

- Canaliculitis
  - Caused by dacryolith (stones) of infection, chronic glaucoma drops, or by intracanicular plugs
  - Signs
    - Mucopurulent fluid from punctum
    - Pouting punctum
  - Treatment
    - Antibiotic drops alone will not resolve the infection
    - Needs canaliculotomy, curettage, and removal of stones or plug
Lacrimal irrigation

1. Diagnosis from irrigation of lower punctum, see table below.
2. Upper punctum may be irrigated but more difficult. Results are same as below.
3. If you suspect an intracanalicular plug (Herrick, Smart Plug) then do not irrigate lower punctum; irrigate the upper punctum; the canalicular obstruction will become a nasolacrimal duct obstruction.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Result</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>Open lacrimal system</td>
</tr>
<tr>
<td>Yes</td>
<td>Resistance</td>
<td>Partial NLDO</td>
</tr>
<tr>
<td>Yes</td>
<td>Easy or resistance</td>
<td>Complete NLDO</td>
</tr>
<tr>
<td>No</td>
<td>Easy or resistance</td>
<td>Internal common punctum obstruction</td>
</tr>
<tr>
<td>Yes</td>
<td>Easy or resistance</td>
<td>Inferior punctum obstruction</td>
</tr>
<tr>
<td>Yes</td>
<td>Easy or resistance</td>
<td>Superior punctum obstruction</td>
</tr>
</tbody>
</table>

Burnstine lacrimal cannula

Irrigation of the lacrimal system

Decrease in tear drainage

- Dacryocystitis
  - Signs
    - Swelling inferior-medial to medial canthus
    - Swelling may affect lids
    - May lead to orbital cellulitis
Decrease in tear drainage

- Nasolacrimal Duct Obstruction
  - Treatment
    - Oral antibiotics such as Keflex or Augmentin for acute dacryocystitis
    - Refer to oculoplastic specialist for dacryocystorhinostomy surgery
    - Patient at continued risk for infection dacryocystitis
    - Serious sequelae of acute dacryocystitis include extension into the orbit with formation of orbital abscess or orbital cellulitis which can lead to blindness, cavernous sinus thrombosis, and death

Multifactorial etiologies for tearing

The blue plate special combo patient
- Lid Margin Disease
- Dry Eye
- Allergic conjunctivitis/rhinitis
- Moderate lower eyelid laxity
- Partial nasolacrimal duct obstruction

A step-wise approach

Treat lid margin disease and dry eye first
Treat allergic component second
Treat lower eyelid laxity and partial nasolacrimal duct obstruction third and fourth
Conclusion

- All tearing patients do not necessarily have dry eye
- Approach systematically
- Treat in a step-wise fashion
- Please do not use intracanalicular (Herrick, Smart plug) plugs!

Who are we?

3 Oculoplastic surgeons
- Melanie Ho Erb, MD
- Steven Dresner, MD
- Michael Burnstine, MD

4 Offices in Los Angeles area
- Santa Monica
- Downtown Los Angeles
- Torrance
- Pasadena

1 Fellowship (2 years)
Of the 38 prestigious fellowships approved through the American Society of Ophthalmic Plastic and Reconstructive Surgeons (ASOPRS)

Thank You
Melanie Ho Erb, M.D.
Eyesthetica
310.453.1763

Santa Monica
3131 Wilshire Blvd, Suite 401
Santa Monica, CA 90403

Torrance
3600 Lomita Blvd, Suite 401
Torrance, CA 90505

Downtown Los Angeles
1177 Wilshire Blvd, Suite 1618
Los Angeles, CA 90017

Pasadena
800 Fairmount Ave, Suite 207
Pasadena, CA 91105