Medical and Surgical Eyelid Problems

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Behold, children are a heritage from the LORD
Psalm 127:3
1. Eyelid Anatomy and Changes with age
2. Eyelid Inflammation, Styes
3. Common Lesions—Benign and Malignant
4. Management Options, Biopsy types
5. Eyelid Malpositions
6. Ptosis and Dermatochalasis, Brow Ptosis
7. Ectropion, Entropion
8. Lagophthalmos and 7th CN palsy
9. Tarsorrhaphy indications
10. Blepharospasm
11. DDX Slides

Eyelid Anatomy

• Lid Crease
• Fornices
• Fissures
• Tarsus

• 2 lamellae – anterior (skin and orbicularis)
  posterior (tarsus and conjunctiva)

• Muscles – Retractors and Protractors

• Tendons – Lateral and Medial Canthal
**Eyelid Muscles**

**Retractors:**
- Levator m.
- Muller’s m.
- 3rd nerve function
- 3rd cranial nerve function
- Sympathetic Function
- Inferior Tarsal Muscle

**Protractors**
- Cranial Nerve VII function

**Things to Note**

**Lid Apposition to Globe**

**Position of Lid Margins**
- Upper 1-2 mm below limbus
- Lower at lower limbus

**MRD = 3-5 mm**

**Canthal Insertions**

**Brow Positions**
Ptosis
Usually age related levator dehiscence, but sometimes a sign of neurologic, mechanical orbital or inflammatory disease

Dermatochalasis
age or hereditary or Brow and Forehead Ptosis—rarely a sign of anything else

Blepharospasm
Sign of *External Irritation* or Neurologic Disease
Eyelid Edema with Inflammatory Signs

Fullness. Loss of lid crease, Erythema, ptosis

What should you think of?

Differential Diagnosis (DDx)

Inflammatory Appearance (red, warm, etc.)

First Consider Underlying Orbital Disease
  - Orbital Cellulitis, Pseudotumor, Wegener’s
  - Graves Ophthalmopathy, Orbital Varix
  - Orbital Tumors that can mimic inflammatory process: Lacrimal Gland CA, Lymphoma, Lymphangioma, etc.
  - Lacrimal Gland – Dacryoadenitis or tumor
  - Sinus Mucocele

Preseptal Cellulitis
  - also think of early -HSV, HZO, or erysipelas (rapid strep), Periorbital necrotizing fasciitis (β-hemolytic strep, staph A., pseudomonas)

Dacryocystitis / Dacryocystocele
Blepharitis
Contact Dermatitis – e.g. Neomycin, Gentamicin, Glaucoma Drops
Urticaria / Angioedema
Conjunctivitis with contiguous lid edema
Insect Bite
Lid Tumors: Hordeolum / Chalazion, CA, Cutaneous Lymphoma
Melkersson-Rosenthal Syndrome – (Granulomatous inflammation)

Without Inflammatory Appearance, consider above but also...

- Allergic Eyelid Edema
- Hormonal Shifts
- Systemic Disorder – Cardiac, Renal, Hepatic, Thyroid with edema
- Graves Ophthalmopathy – can just have lid edema w/o inflammatory appearance Lymphedema after trauma, surgery to lids or orbit (e.g. lymphatics in lateral canthus)
- Traumatic Leak of CSF into upper eyelid (JAMA Oph 2014;312:1485)
- Blepharochalasis

Not True Edema, but might mimic it: Dermatochalasis, Hidden Eyelid or Sub-Conjunctival Mass, Prolapsed Orbital Fat
Case of Chronic Eyelid Swelling/Erythema

Orbital Pseudotumor

Orbital Signs
When eyelid edema might be the tip of iceberg

Proptosis
Chemosis
Poor Motility
Poor Vision
Pupil abnormality – e.g. RAPD

When you're concerned about:
- Orbital Cellulitis
- Orbital Pseudotumor
- Orbital Malignancy
- Vascular – e.g. CC fistula
Pre-Septal Cellulitis

Good Vision
Good Motility
No Chemosis
PERRL w/o RAPD

Lacrimal Dacryocystitis

Dacryocystitis
Some more relatively benign conditions

- Conjunctivitis
- Hordeola
- Allergic
- Chalazion
- Pyogenic Granuloma

“Styes”
Hordeolum, Chalazia and Pyogenic Granuloma

- Often in association with Blepharitis and Obstruction of Sebaceous glands

- Hordeolum—Acute / infectious (e.g. staph.) → local cellulitis

- Chalazion—Chronic / → Lipo-granulomatous inflammation

- Pyogenic Granuloma → granulation tissue response
Sign of underlying Meibomian gland/ sebaceous gland dysfunction / Blepharitis

Hordeolum

Acute Inflammation of glands:

- Meibomian - *Internal*

- Hair Follicles, Zeis or Moll Glands - *External*
"Point"

*Drain through Meibomian orifice*

Hordeolum

Eyelid Abscess
Some confusion with Hordeolum

*Incision and Drainage* indicated

if it does not resolve on medical therapy
Chalazia

External

Internal

Right at lid margin

Sometimes mainly internal
Pyogenic Granuloma (Lobular Capillary Hemangioma)

- Reactive Hemangioma, with granulation tissue, proliferating capillaries
- Response to trauma, irritation, surgery, suture, underlying Chalazion

RX: Topical Steroid ung, Excision, now even Timolol reportedly of help


Management

- Hot Compresses
- Lid Scrubs
- Topical Drops or Ointment: Emycin or maybe steroid (Tobradex)
- Oral Antibiotics? Doxycycline 100mg qweek for up to 26 weeks — might be useful for “chalazion attacks”.
- Intralesional Injection of Triamcinolone (OPH 2005; 112:913)
  Consider before excision in some cases
- Excision — (not usually I/D - Incision and Drainage)
Recall signs of Malignancies
1) lash loss
2) ulceration, bleeding
3) telangiectasias
4) irregular pigmentation
5) distortion or destruction of eyelid anatomy

Vascular
- Hemangioma
- Cherry Angioma – Bright red
- Venules
- Other: Kaposi’s Sarcoma, Pyogenic Granuloma

Crater / Ulcerated
- Carcinomas (BCCA, SCCA, etc)
- Keratoacanthoma
- Molluscum Contagiosum

Don’t Forget: Chalazion, Hordeolum and their Mimics (e.g. Sebaceous Cell CA)
Lid Tumors

Need to think about possible orbital involvement

Common Benign Eyelid Lesions

- Chalazion and related lesions
- Epithelial Inclusion Cyst
- Nevus
- Papilloma
- Seborrheic Keratosis
- Apocrine Hidrocystoma
- Hemangioma
- Xanthelasma
- Cutaneous Horn

**Usually:**

*Do not destroy normal architecture of eyelid*
*Do not bleed, no lash loss*
Can be pigmented, can mistake them for nevi or worse

Papilloma

Seborrheic Keratosis (SK)

Can be pigmented, can mistake them for nevi or worse
Cutaneous Horn

Xanthelasma
What is it?

Capillary Hemangioma

Adult with small hemangioma

Cysts

Sebaceous Cyst or Epidermal inclusion cyst
Some can have bluish / blackish color

(Apocrine hidrocystoma)

Hidrocystoma

Nevi

can be pigmented or non-pigmented

- Congenital or Acquired
- Acquired often between 5-10 years old
- Can be biopsied if changes noted
Eyelid Malignancies

Signs of possible malignancy

(External)

- Loss of lashes - Madarosis
- Ulceration
- Bleeding
- Telangiectatic Vessels
- Chronic Inflammatory signs
- Distortion on Anatomy
- Pigmentary Changes
Basal Cell Carcinoma

- Most common eyelid malignancy
- Lower Lid margin > Upper lid
- Nodular, Pearly
- Invasive, Infiltrating Morpheaform
- Gorlin’s Syndrome
- Basal cell—nevus syndrome

Local Invasion
No Metastatic Potential

Squamous Cell Carcinoma

More biologically aggressive
Can arise from areas of solar damage or actinic keratosis

Potential for metastasis
Check Lymph nodes
Conjunctival Pagetoid Spread

Highly Malignant and potentially lethal

Can Masquerade as
- Blepharitis, chronic inflammation
- Blepharoconjunctivitis
- Chalazia*
- Diffuse Eyelid thickening

Suspected Malignancy Management Options

- Simple excision with permanent
  (e.g. borders seem clear \(\rightarrow\) ellipse, or wedge)*

- Incisional Biopsy – to make further plans

- Frozen Section Controlled Excision
  (e.g. uncertain of clinical extent of invasion of tumor)

- Mohs micrographic - Dermatology
Pigmented lid lesions
Differential Diagnosis

Nevus

Papilloma

SK

Yikes! (MM)

Malignant Melanoma
Recruit the help of a dermatologist*

Realize and inform your patients that more than one procedure may be necessary.

Incisional biopsy OK

Don’t be hesitant to “refer”**

** remember a good doctor knows his limitations

*Regarding periodic whole body exams (since other cutaneous melanomas more likely), Woods Light recommendations

What do you suspect? What would you do?
What would you do?

Approaches to Excision of Suspected Malignancies

- Incisional Biopsy First??
- Excisional Biopsy – e.g. Ellipse
- Wedge Resection
- Permanent Section
- Frozen Section
- MOHS
Incisional Biopsy

- Removal of small section of tumor*
- Pathologic confirmation, prior to committing the patient to a bigger procedure:
  - e.g.
  - Full thickness lid—large amounts of tarsus
  - e.g. wedge

Excision of other vital structures
  - e.g. punctum, canaliculus, sac
  - Canthal tendons (LCT or MCT)

Wedge Resection

Excisional Biopsy

- Suspicious for Malignancy*
- Concern for invasion**
- Lid Laxity present

Sometimes can do primarily
  - e.g. clear BCCA with definite borders near margin
Eyelid Malpositions

Too High or Too Low? – Lid Retraction or Ptosis
In or Out? – Entropion or Ectropion

Upper lid position

The upper eyelid margin is normally situated 1.5 mm to 2 mm below the superior limbus and 3 mm to 5 mm above the center of the cornea.

The lower eyelid margin is normally situated at the inferior limbus.
Eyelid Retraction

1. **Graves / Thyroid Eye Disease**
   - Need referral for further evaluation

2. **Other Orbital Disease**
   - Surgical Correction only after etiology is known and underlying problems have been addressed

3. **Cicatricial / Scarring**
   - Trauma, Post Surgical

4. **Neurological Problem — not common**

5. **Pseudo-retraction — contralateral Ptosis**
   - Lower Lids can be retracted too

Thyroid Eye Disease Signs

- Unilateral or Bilateral Eyelid Retraction
- Unilateral or Bilateral Proptosis
- Lid Lag on Downgaze
- EOMduction restrictions - IR>MR>>SR, LR
- Strabismus – Esotropia or Hypotropia
- Lagophthalmos
- Corneal Exposure
- Chemosis, Injection
"Droopy Eyes" - Definitions

• **Ptosis**: More properly called Blepharoptosis. A lowering of the upper eyelid so as to cause a narrowing of the palpebral fissure height and a reduction of MRD (often MRD < or = 2 mm)

• **Dermatochalasis**: Redundancy of eyelid skin (upper or lower). This redundancy is linked to the position of the eyebrow. This is also sometimes associated with orbital fat prolapse.

• **Brow Ptosis** — A lowering of the eyebrow position — which can affect both the hooding of dermatochalasis and the eyelid position as well

• **Blepharoplasty**: Excision of redundant eyelid skin and/or orbital fat.

• **Blepharoplasty ≠ Ptosis Repair**

Drooping Upper Eyelids

Dermatochalasis of Upper Lids

Ptosis of Upper Lids
Blepharoptosis

Ptosis of the Brow
Brow Ptosis
Dermatochalasis

Without or With Upper Eyelid Ptosis

Dermatochalasis with lateral hooding and MRD 4 mm OD and 4 mm OS

Lateral Hooding

Dermatochalasis plus Ptosis

Eye Brows

- Elevators — Frontalis Muscle
- Depressors — Corrugator and Procerus Muscles

Brow normally located above superior orbital rim
Brow Ptosis — measure distance from mid-brow to superior orbital rim in mm.

Brow Ptosis
DDX:
Involutional (Age)
Seventh CNP
Facial Surgery or Trauma

NOTE — how brow ptosis contributes to hooding from dermatochalasis
Real Ptosis

Blepharoptosis

- “Congenital”

- Acquired
  - Levator Dehiscence
  - Neurological*
  - Mechanical
  - Orbital Disease
  - Myogenic
  - Inflammatory

“Ptosis Evaluation”

- Do they have real eyelid ptosis (Blepharoptosis)?
- If –Yes– then need consider DDx for Ptosis

- Further exam to check for Dermatochalasis and Brow Position as these are important factors in the future surgical plan

- We need to consider whether the patient needs:
  - true ptosis surgery (Levator or Muller’s muscle)
  - blepharoplasty
  - brow lifting
**Ptosis**

**Levator (Dehiscence)**
- Aging, Trauma, Post-op (e.g. CE), Post-inflammation, CTL wear

**Congenital, Hereditary**
- *Levator Mal-development*, Blepharphimosis Syndrome (BPES)

**Neurological**
- 3rd Nerve Palsy, Horner Syndrome

**Orbital Disease**
- Cellulitis, Pseudotumor, Graves or Tumor

**Myogenic**
- *Myasthenia Gravis*,
- CPEO
- Muscular Dystrophies  
  e.g. Oculopharyngeal MD, Myotonic MD

**Mechanical**
- Eyelid Tumor (e.g. NF), Chalazion  
  - Excessive Dermatochalasis and/or Brow Ptosis

**Inflammatory**
- Eyelid, Orbit, Uveitis, Conjunctivitis, Keratitis (e.g. SLK)

**Pseudo-Ptosis**
- Enophthalmos (see list)
- Phthisis or small globe or Anophthalmos  
  - Blepharospasm, Dermatochalasis  
  - or Brow Ptosis Mistaken for ptosis
- Hypertrophia, Hypotrophia

**Congenital Ptosis**
with diminished lid crease  
head tilt

Images from emedicine
Acquired Ptosis

- Aponeurotic
  - Due to age, trauma, CE, injection
- Neurogenic
  - Horner’s, Third Nerve
- Myogenic
  - Myasthenia, CPEO
- Mechanical
  - Tumor, Chalazion, Brow Ptosis
- Inflammatory
  - Uveitis, Keratitis, Conjunctivitis, Cellulitis, Dacryoadenitis

Levator Aponeurosis Dehiscence

- Usually age related
- Trauma, previous ocular surgery (e.g. Cataract, Phaco) or injections (e.g. sub-Tenon’s steroid)
- Often worse on downgaze
  “have to lift eyelid up to read”
- Good Levator function (> 10 mm)
- Eyelid crease maybe high, or less evident
Aponeurotic

- Age, Senile, Involutional
  Levator dehiscence or disinsertion
- Traumatic
- Chronic Inflammation
  Herpes Zoster, Orbital Pseudotumor, Uveitis
- Chronic Lid Edema
  Graves Ophthalmopathy, Allergic, Blepharochalasis
- Post operative
  Ophthalmic Surgery, cataract extraction, Sub-Tenon’s injection

Neurological

- Third Nerve Palsy/Paresis
- Horner’s Syndrome
- Migraine
- Cerebrovascular Accident (rare)
  Brainstem
  Unilateral or Bilateral Hemispheric
  or Frontal Lobe Lesions
  (Apraxia of Lid Opening)
Myogenic

- Myasthenia Gravis, Ocular Myasthenia
- Mitochondrial Myopathies
- CPEO¹; Kearns-Sayre syndrome
- Muscular Dystrophies:
  Oculopharyngeal MD*
  Myotonic Dystrophy**

¹ – Chronic Progressive External Ophthalmoplegia

Consider Neurologic and Neuromuscular problems

<table>
<thead>
<tr>
<th>Condition</th>
<th>Pupils</th>
<th>Eyelids (ptosis)</th>
<th>Motility Deficit</th>
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<tbody>
<tr>
<td>Myasthenia Gravis</td>
<td>-</td>
<td>+/-</td>
<td>+/-</td>
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<tr>
<td>3rd Cranial Nerve Palsy</td>
<td>+/-</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Horner’s Syndrome</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>7th Cranial Nerve Palsy</td>
<td>-</td>
<td>+/- (mechanical from brow ptosis)</td>
<td>-</td>
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With Ptosis – also Check Pupils and Motility!
**Ptosis**
can be a sign of orbital disease

NOTE:
Eyebrows are elevated

MRI of Brain?

CT of Orbits

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**Mechanical**

- Eyelid Tumor
- Orbital Tumor
- Scarring interfering with upper lid mobility
- Brow Ptosis
  - Seventh CNP
  - Trauma, Surgery, Age
Inflammatory

- Conjunctivitis
- Cellulitis
- Keratitis
- Uveitis
- Orbital Inflammatory process

Will resolve or get aponeurotic ptosis

Evaluation of Patients with Upper Lid Drooping

Dermatochalasis and Hooding - Touching UL lashes?
Brow Elevation or Ptosis

MRD – marginal reflex distance
LF - Levator Function

Pupils and Motility – R/O Horner’s Syndrome, MG and Third CN Palsy

Corneal Exposure, Dryness

Visual Field Testing
  - 30-2 or 24-2 HVF
  - 36 Point Screening Superior Test (BLEPH VF)

Can produce significant superior and lateral visual field loss
**Evaluation**

**MRD** is the distance from the upper lid margin to the corneal light reflex.

Visually significant Ptosis usually with MRD of 2mm or less – depending on pupil size.

**Vertical Fissure Height**

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**Measuring Levator Function**

**Upgaze**

**Downgaze**

**LF** = total excursion of upper lid from maximal elevation to maximal depression.

*(Best to hold brow while making measurement to eliminate its contribution)*
Levator Function

<table>
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<tr>
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<th>Good</th>
<th>Fair</th>
<th>Poor</th>
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<tbody>
<tr>
<td>Range</td>
<td>&gt; 10 mm</td>
<td>6 – 10 mm</td>
<td>&lt;= 5 mm</td>
</tr>
<tr>
<td>More Typical of:</td>
<td>Levator Dehiscence</td>
<td>Neurologic and Myogenic</td>
<td>Levator Maldevelopment</td>
</tr>
</tbody>
</table>

Taking eyebrows, dermatochalasis, MRD, LF and Corneal status in account ....

Surgical Options for Drooping Eyelids

1. Blepharoplasty
2. Brow Lifting
3. Levator Advancement
4. Levator Resection
5. Sling Procedures
6. Posterior Resection Procedures

One or more of these procedures
Usually signs of lid laxity and age related changes -
But need to think about *Cicatricial processes* –
and sometimes even *orbital disease* – e.g. Orbital tumor or Graves Ophthalmopathy
Ectropion of Lower Eyelid

• Involutional — lid laxity*
• Cicatricial
• Combination of two above

• Paralytic — 7th nerve
• Mechanical
• Congenital

Medial Ectropion
(Eversion of Punctum)
Ectropion repair

Depending on Mechanisms

- Lid Tightening
- Skin Grafting
- Plication of Lid Retractors

Upper Lid Ectropion?

- Congenital Ectropion
- Floppy Eyelid Syndrome
- Skin Retraction
  (result of chemical burn)
Floppy Eyelid Syndrome

Floppy Eyelid Syndrome with h/o eyelid manipulation and corneal exposure problems

Procedure: UL Lid tightening:

Entropion and Trichiasis
Management of Trichiasis

• Need to first find the cause
  (e.g. entropion, shortened fornix, distichiasis, lash misdirection)

• Epilation

• Lash Destruction
  Electrolysis, Cryo-probe, Follicle Excision and Cautery

• Wedge Resection

• Repair of Entropion

Lower Lid Entropion

• Involutional

• Cicatricial
  Ocular Cicatricial Pemphigoid (OCP)

• Congenital
  Epiblepharon
Involutional / Spastic Entropion

- Horizontal Lid Laxity
- Lower Lid Retractor Dehiscence Laxity
- Orbicularis Override and Spasm

Upper Lid Entropion and Trichiasis

- Mechanical – excessive Dermatochalasis

- Cicatricial –
  - Trauma, Burns
  - HZO
  - Chronic Bleparo-conjunctivitis
    - e.g. Acne Rosacea
  - Trachoma
  - Stevens-Johnson Syndrome, SLE
    - (Most cases due to secondary scarring and contracture of posterior lamella)
Lagophthalmos

• Eyelid Retraction

• Seventh Nerve Palsy

• Graves Disease

Post-op UL and LL Blepharoplasty

Lagophthalmos
(poor, incomplete eyelid closure)

• Paralytic
  Seventh Nerve Palsy

• Mechanical
  Graves Ophthalmopathy

• Cicatricial
  Trauma
  Burns
  Surgery
    Blepharoplasty
    Tumor resection
Seventh Nerve Palsy

- Lagophthalmos
- Exposure Keratopathy
- Tear Pump Dysfunction
- Brow Ptosis
- Lower Lid Ectropion

Causes

- Infection: HIV, HZV, Lyme
- Tumor – Brainstem, Parotid Gland area, …
- Traumatic

Idiopathic = Bell’s Palsy
Exposure and Epithelial Surface Problems

• What do you do when you have:

1. A corneal epithelial defect that won’t heal.
2. A cornea with chronic PEK / Epitheliopathy from exposure or problems with the tear film
3. Chronic Chemosis

1st – attempt to address the underlying problem

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**Exposure Related**
- Eyelid Malpositions: Entropion/Trichiasis, Ectropion, Lid retraction, FES
- Lagophthalmos
  - Cicatricial
    - Neuro-paralytic (7th CNP, worsen when also 5th CNP)
- Orbital Disease (TED, Tumors, etc.) – Proptosis, Lagophthalmos, Chronic Chemosis

**Tear Film Related**
- Loss of Conjunctival Function from Inflammation, Tumor, Trauma, etc.
  - goblet cells, lacrimal glands – Trauma, Inflammatory diseases (SJ5, etc.)
- Loss of Meibomian function – blepharitis, inflammatory, etc.

**Other**
- Keratitis: Herpetic, active and non-responsive Bacterial/ Fungal ulcers to Rx, systemic inflammatory, vernal, neurotrophic
- Recurrent Erosion Syndrome – corneal dystrophies, trauma, diabetes, LSCD
- Topical Medications
- PBK
- Poor / Inadequate blinking for patient with severe head trauma / ICU
Options—Medical and Surgical

1. Lubrication—artificial tears, ointments
2. Lacrimal drainage occlusion - punctal plugs
3. Bandage Contact Lens, Scleral CTLs
4. Tarsorrhaphy
5. Repair of any Eyelid Malpositions
6. Repair of Fornices - grafting
7. Gunderson Flap
8. Limbal Epithelial Cell Transplantation??

Indications
To protect the cornea in the case of:
- inadequate eyelid closure, for example due to facial nerve palsy or cicatricial (scarring) damage to the eyelids caused by a chemical or burns injury
- an anesthetic (neuropathic) cornea that is at risk of damage and infection
- marked protrusion of the eye (proptosis) causing a risk of corneal exposure
- poor or infrequent blinking, e.g. patients in intensive care or with severe brain injuries.
- To promote healing of the cornea in patients with:
  - an infected corneal ulcer, which is taking a long time to heal
- non-healing epithelial abrasions.
- Other indications include:
  - To prevent conjunctival swelling (Chemois) and exposure after ocular surgery
  - To retain a conformer or other device, for example in children with Anophthalmos or adults after evisceration or enucleation.
Temporary Tarsorrhaphy

- One interrupted stitch - no bolster — very temporary
- Horizontal — spreads out the force
- Mattress-like — with bolsters — 1-2 weeks

“Horizontal Mattress” with Bolsters

Suture - 5-0 Silk
Goal – adhesion between upper and lower tarsal plates, not just skin.

Reversible
Blepharospasm – primary or secondary?

- **Medications:** antihistamines, dopamine stimulators, nasal contestants
- **5th cranial nerve irritation** - Ocular or meningeal
  - Ocular – Blefaritis, Dry eye, keratitis, uveitis, scleritis, etc.*
- **Benign orbicularis myokymia**
- **Facial Myokymia** – Pontine disease, MS**
- **Other CNS**- Parkinsons, PSP, Tardive Dyskinesia, Tourette’s
- **Other** – Myotonic dystrophy, Excessive Blinking***

- **Hemifacial Spasm** (7th)
- **Benign Essential Blepharospasm (BEB)**

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Treatment of Blepharospasm

- **TREAT UNDERLYING CONDITION!!!**

- **Systemic Medications of Little Value**
  - Clonazepam

- **Alleviating Maneuvers** (JAMA Oph 2016;134:1247-1254)

- **Botulinum injections**

- **Surgery**
  - Blepharoplasty
  - Orbicularis myectomy
  - Neuro-surgical decompression of VII
Botulinum Toxin

Seven Serotypes A-G
Only two Serotypes currently Used A and B

Type A XEOMIN® - incobotulinum toxin A
Type A BOTOX® - onabotulinumtoxin A
Type A DYSPORT® - abobotulinumtoxin A
Type B MYOBLOC® - rimabotulinumtoxin B

Differential Diagnosis Lists
Eyelid Signs

- Blepharospasm
- Ptosis
- Eyelash Problems
- Entropion and Trichiasis
- Ectropion
- Eyelid Retraction
- Lagophthalmos
- Seventh Nerve Palsy

I have no financial interests or conflicts of interest.
First Consider Underlying Orbital Disease
- Orbital Cellulitis, Pseudotumor, Wegener’s
- Graves Ophthalmopathy, Orbital Varix
- Orbital Tumors that can mimic inflammatory process: Lacrimal Gland CA, Lymphoma, Lymphangioma, etc.
- Lacrimal Gland – Dacryoadenitis or tumor
- Sinus Mucocele

Presacral Cellulitis
- also think of early -HSV, HZO, or erysipelas (rapid strep), Periorbital necrotizing fasciitis (β-hemolytic strep, staph A., pseudomonas)

Dacryocystitis / Dacryocystoceles
- Blepharitis
- Contact Dermatitis – e.g. Neomycin, Gentamicin, Chronic Glaucoma Drops
- Urticaria / Angioedema
- Conjunctivitis with contiguous lid edema
- Insect Bite
- Lid Tumors: Hordeolum / Chalazion, CA, Cutaneous Lymphoma
- Melkersson-Rosenthal Syndrome – (Granulomatous inflammation)

Without Inflammatory Appearance, consider above but also…
- Allergic Eyelid Edema
- Hormonal Shifts
- Systemic Disorder – Cardiac, Renal, Hepatic, Thyroid with edema
- Graves Ophthalmopathy – can just have lid edema w/o inflammatory appearance
- Lymphedema after trauma, surgery to lids or orbit (e.g. lymphatics in lateral canthus)
- Traumatic Leak of CSF into upper eyelid (JAMA Oph 2014;312:1485)
- Blepharochalasis

Not True Edema, but might mimic it:
- Dermatochalasis, Hidden Eyelid or Sub-Conjunctival Mass, Prolapsed Orbital Fat

Eyelid Edema

Cystic Like / Fluid Filled
- Hydrocystoma / Sudoriferous Cysts – clear fluid
- Sebaceous Cyst, Epithelial Inclusion Cyst – both usually have white/yellow appearance
- Blister, Bulla, Vesicle (e.g. HSV), Pustule

Pedunculated
- Papilloma, Skin Tag, Cutaneous Horn

Darker / Pigmented
- Nevus
- Melanoma – often irregular pigmentation and borders
- Sebaceous Keratosis (SK) – sessile, stuck on appearance
- Xanthelasma – yellowish – often medial canthal skin
- Kaposi’s Sarcoma
- Some Cysts will have dark appearance clinically:
  - e.g. apocrine cyst, some inclusions cysts

Nodular - Commonly at Lid Margin
- Intradermal Nevus
- BCCA
- Hair Follicle Tumor

Recall signs of Malignancies
1) lash loss
2) ulceration/bleeding
3) telangiectasias
4) irregular pigmentation
5) distortion or destruction of eyelid anatomy

Vascular
- Hemangioma
- Cherry Angioma – Bright red
- Varix
- Other: Kaposi’s Sarcoma, Pyogenic Granuloma

Crater/Ulcerated
- Carcinomas (BCCA, SCCA, etc)
- Keratoacanthoma
- Molluscum Contagiosum

Don’t Forget: Chalazion, Hordeolum and their Mimics (e.g. Sebaceous Cell CA)
**Primary—Benign Essential Blepharospasm (BEB)**

- **Associations:** Apraxia of eyelid opening, Meige's Syndrome and other cranial/cervical dystonias
- **Extrapyramidal disorders** (Parkinson, Huntington, and basal ganglia infarction)

**Secondary Blepharospasm**

- **Medications:** antihistamines, dopaminergics, nasal decongestants
- **External Disease:** Foreign Body, Keratitis
- **Consider any cause of Photophobia (see list)**
  - 5th CN Irritation* — Ocular (Uveitis, etc.) or Meningeal (meningitis, parasellar tumor), Trigeminal Neuralgia
  - Paraneoplastic Syndrome — e.g. Anti-Hu / small Cell CA

**Myotonic Dystrophy**

**Aberrant Facial Nerve Regeneration** — after peripheral facial nerve palsy

**Hemi-Facial Spasm** — Low, but possible risk if CPA tumor or aneurysm

**Orbicularis Myokymia** — Usually only an upper or lower lid, as opposed to true Blepharospasm

**Facial Myokymia** — pontine glioma, MS, Neurodegenerative diseases: e.g. ALS, Huntington’s Chorea

**Tardive Dyskinesia** — Multiple Meds can cause—not just neuroleptics (JNO 1998; 18:153)

**Eyelid Nystagmus**

**Torrette’s Syndrome**

**Excessive Blinking**

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**Levator (Dehiscence)**

- Aging, Trauma, Post-op (e.g. C1), Post-Inflammation, C/T wear

**Congenital, Hereditary**

- **Levator Mal-development**, Marcus Gunn Jaw Winking, Blepharophimosis (BPES)
- **Congenital Cranial Dysinnervation Syndromes** (e.g. Congenital Fibrosis)

**Neurological**

- 3rd Nerve Palsy, Horner Syndrome
- Hemispheric Stroke (unilateral or bilateral — associated with hemiparesis)*
- Migraine — Isolated Ptosis? “seen with Hemiparina Continua” — can have associated isolated ptosis
- Immune Mediated Polyneuropathies — e.g. Guillain – Barre Syndrome

**Orbital Disease**

- Inflammatory: Cellulitis, Pseudotumor, Graves
- Tumor: Lymphoma, etc.

**Myogenic**

- **Myasthenia Gravis**, Lambert-Eaton Myasthenic Syndrome
- CPEO
- Muscular Dystrophies e.g. Oculopharyngeal MD, Myotonic MD

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**Ptosis**

- **BPES**

**Mechanical**

- Eyelid Tumor (e.g. NF), Chalazion
- Excessive Dermatochalasis and/or Brow Ptosis
- Floppy Eyelid Syndrome (Laxity, Lash Ptosis)

**Inflammatory**

- Eyelid, Orbit, Uveitis, Conjunctivitis, Keratitis (e.g. SLK)

**Other**

- Prostaglandin (Topical) Associated Orbitopathy**
- Observed associations with isolated ptosis: elevated BP

**Pseudo-Ptosis**

- Enophthalmos (see list)
- Phthisis or small globe or Anophthalmos
- Blepharospasm, Dermatochalasis of Brow Ptosis Mistaken for ptosis
- Hypertropia, Hypotropia
Madarosis (Loss of Lashes)
- R/O Carcinoma — e.g. BCCA, Sebaceous Cell CA
- Chronic infection — e.g. Herpetic, Staph, Fungal, Mites, Blepharitis
- Endocrine — e.g. Hyper and hypo parathyroid and thyroid, hypopituitarism
- Dermatoses — e.g. Dermatitis (atopic, contact), ichthyosis, lichen planus, ... (many)
- Trauma — radiation, chemical, Thermal, tattooing, surgery, cryo
- Congenital disorders — multiple
- Drugs and Toxins — e.g. Arsenic, Chemotherapy, Botulinum, ...
- Systemic Conditions — e.g. Parry-Romberg, VKH, Lupus, Sarcoidosis, ...

Hypertrichosis (Excess Lashes = Trichomegaly)
- multiple congenital / genetic causes
- frequent manipulation
- Paraneoplastic syndrome
- malnutrition, anorexia, pregnancy, thyroid problems, lupus, uveitis
- Drugs: prostaglandin analogs (e.g. bimatoprost)

Lower Lid Entropion and Trichiasis
Involutional (Senile) — can have spastic (orbicularis) component
Acute Spastic Entropion — after trauma or surgery
Cicatricial (see below)
Congenital / Developmental — e.g. Epiblepharon
Distichiasis — abnormal lashes growing from posterior lid margin (meibomian orifices)
    could be hereditary or from inflammatory process (see below)

Upper Lid Entropion and Trichiasis
Mechanical — excessive Dermatochalasis
Cicatricial (see below)
Distichiasis

Cicatricial Causes (Most cases due to secondary scarring and contractures of posterior lamella)
- Previous Trauma or Surgery at or near eyelid margin
- Chemical Burn
- HZO
- Chronic Blepharoconjunctivitis — e.g. Acne Rosacea
- Trachoma
- Stevens-Johnson Syndrome, Ocular Cicatricial Pemphigoid

* Sometimes Orbital Disease can present with eyelid malpositions
**Lower Lid Ectropion**
- Senile – with horizontal laxity, check for Medial or Lateral Canthal Tendon laxity
- Cicatricial (below)
- Combination of both above
- Paralytic—7th nerve palsy, MG
- Mechanical—Tumor or Big Festoons
- Congenital—Icthyosis; Euryblepharon—excess horizontal skin

**Upper Lid Ectropion**
- Cicatricial Processes (below)
- Congenital—e.g. Ichthyosis
- Floppy Eyelid Syndrome—Horizontal Laxity—no true ectropion

**Cicatricial Changes (of anterior lamella)**
- Trauma to Eyelids and Face
- Burns—Thermal and Chemical
- Sun Damage, Carcinoma
- Previous Eyelid and Adnexal Surgery
- Chronic Inflammation: Rosacea, Atopic Dermatitis, HZO, Infection

*Sometimes Orbital Disease can present with eyelid malpositions*

**Graves Ophthalmopathy- #1 – unilateral or bilateral**

Other Causes of Hyperthyroidism
- Other Orbital Inflammatory or Neoplastic Conditions
  - Orbital Pseudotumor, FB, Granulomatous Inflammation, Neoplasm

**Cicatricial Process**
- Skin or Posterior Lamellar (Trauma, Burns, Systemic or Local Inflammatory Disorders)

**Trauma / Post-Operative**
- Entrapped Inferior Rectus
- Vertical Rectus Muscle Recession Surgery
- S/P Eyelid or Conjunctival Surgery

**Neurologic**
- e.g. Dorsal midbrain syndrome (Collier’s sign), aberrant regeneration of the 3rd CN
- Metabolic (thyroid, cirrhosis, uremia, Cushing’s syndrome, hypokalemia)
- Pharmacologic—sympathomimetcs, corticosteroids
- Congenital—persistent or periodic unilateral retraction reported
- Physiologic / Normal Variant—about 2% of population has MRD>5.3mm

**Pseudo-retraction**
- Contralateral Ptosis (Herring’s Law)
- Proptosis
- Lower Lid Laxity
- Large Myopic Eye, prominent glaucoma filtering bleb

*Sometimes Orbital Disease can present with eyelid malpositions*
Lagophthalmos
Inability to Close Eyelids

Neurological
Seventh Nerve Palsy

Cicatricial (Scarring)
Trauma
Burns
Surgery
Blepharoplasty, Ptosis Surgery
Tumor resection

Orbital Condition
Proptosis: Graves Ophthalmopathy, etc. (see list)
Orbital Inflammatory or Neoplastic Processes

Myogenic – MG, Muscular Dystrophies, CPEO
Botulinum Injections

See Exposure Keratitis

Don’t Confuse with Lid Lag on Downgaze

Congenital Ptosis
Graves Ophthalmopathy
Aberrant Regeneration after 3rd CNP
Neurologic and Muscular Disease
- Supranuclear Palsy
- Myotonic Dystrophy
- MG?
Post-op Upper Eyelid Procedures
Possible Sign of Other Orbital Disease

Seventh Nerve Palsy
Hemifacial Paralysis with Lagophthalmos

- Motor Strip Lesion (Upper Motor Neuron) → Contralateral Lower Face Paralysis

- Peripheral Nerve Palsy – Ipsilateral Upper and Lower Face Paralysis
  CPA Tumor – e.g. Acoustic Neuroma
  Other tumors – Parotid, Skull based, temporal bone, external auditory canal
  Trauma – facial, skull base (temporal bone), birth
  Lyme Disease – B. Burgdorferi
  HIV infection
  Central – CVA (e.g. superior cerebellar a. infarct – deafness, Horner’s, 7th CNP)
    - Parkinson’s
  Ramsay-Hunt Syndrome (Herpes Zoster Oticus)
  Mastoiditis / Otitis – 6th and 7th CNP possible
  External Auditory Canal and Middle Ear – surgery, tumor
  Other - Neuro-Sarcoidosis, Leprosy, Pregnancy (3rd Trimester), MS
    Vasculitis, DM, Uremia

and Bell’s Palsy (Idiopathic 7th CNP)

Most Common 7th Nerve Palsy, but better to put Bell’s Palsy down at bottom the list – to make you think of other things first

A 7th Nerve Palsy is not necessarily a Bell’s Palsy!
Does He who formed the eye, not see?

Psalm 94:9