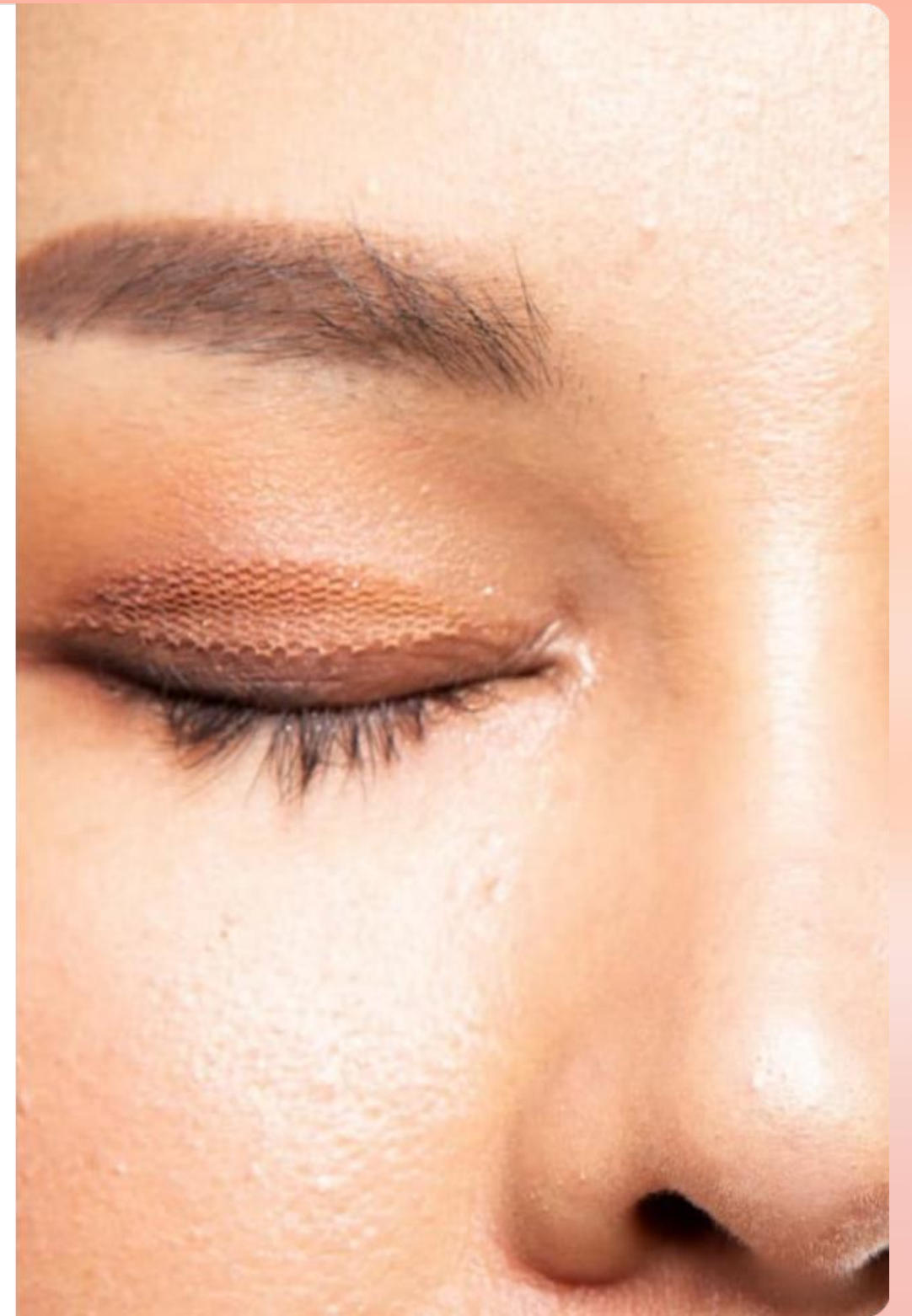


Ocular Adnexa

Selina McGee, OD, FAAO



Financial Disclosures for Selina R. McGee, OD, FAAO

- Allergan-Speaker/Consultant
- Avellino-Consultant
- Bausch & Lomb-Speaker/Consultant
- Bruder-Consultant
- CynoSure-Speaker/Consultant
- Dompe-Speaker/Consultant
- Eyevance-Consultant
- Horizon-Consultant
- Lumenis-Speaker/Consultant
- Optovue-Speaker/Consultant
- Osmotica-Speaker/Consultant
- Oyster Point-Speaker/Consultant
- Compulink-Consultant
- Novartis-Speaker/Consultant
- Versant-Consultant
- Science Based Health-Speaker/Consultant
- Sun-Speaker/Consultant
- Tarsus-Speaker/Consultant
- Topcon-Consultant
- Zeiss-Consultant

All financial relationships have been mitigated.

Ocular Adnexa and Eyelids–Optometry's Next Frontier

1 The eyelids are responsible for the continued health of the ocular surface

They are uniquely positioned and built to do so.

2 The eyelids are affected differently than any other skin found on the body

They undergo numerous disease and aging processes.

3 This course will discuss:

- Lumps and bumps
- Rhytids and drooping
- Periorbital aging anatomy

Periocular Anatomy and Abnormalities



Eyelid Anatomy

The eyelids are composed of several intricate layers, including skin, muscle, fat, and connective tissue. Understanding the unique periorbital anatomy is key to identifying and treating abnormalities.



Midface Connection

The eyelids are closely linked to the midface region, with muscles and connective tissues extending from the cheeks and brows. Changes in the midface can significantly impact the appearance and function of the eyelids.



Periorbital Abnormalities

Eyelid and periorbital skin are susceptible to a variety of age-related changes, including wrinkles, sagging, and discoloration. Understanding the underlying causes is essential for proper treatment.



Treatment Approaches

A range of non-surgical and surgical options are available to address various periorbital concerns, from topical treatments to minimally invasive procedures. Proper assessment and tailored approaches are key to achieving optimal results.

A faded, high-key portrait of a woman's face serves as the background for the slide. The image is centered and occupies most of the frame, with the woman looking directly at the camera. The colors are very light, almost white, with subtle shadows defining her features. The overall aesthetic is clean and professional.

Facial Anatomy and Eyelid Skin

1. Review Facial Anatomy and how it all works together
2. What's unique about the skin around the eyelids?



What can go wrong.

1 Eyelid Health & Habits

The eyelids are responsible for the continued health of the ocular surface and can be affected by various disease and aging processes. Eyelid Hygiene is paramount to ocular surface health.

3 Blepharoptosis

Droopy lids are more common and can be managed in a multitude of ways.

2 Lids Lumps and Bumps

Eyelids can develop benign lesions such as chalazions, skin tags, verrucae, seborrheic keratosis, cysts, and nevi.

4 Cancer

Eyelid cancers such as basal cell carcinoma, squamous cell carcinoma, malignant melanoma, and sebaceous gland carcinoma can occur.



Eyelid Health

- Bacteria and Bugs-Blepharitis
- Habits
- Ocular Eyelid Hygiene





DEMODEX BLEPHARITIS| A PERVASIVE AND DAMAGING EYE DISEASE

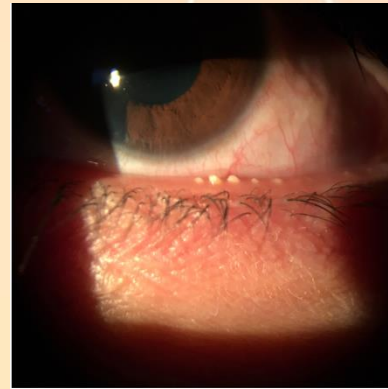
- **Blepharitis is the inflammation of the eyelids** causing irritation and redness
- **69% of blepharitis cases are due to Demodex infestation leading to Demodex blepharitis¹⁻⁴**
- Demodex mites are implicated in other diseases of the lid and lid margin, including blepharitis and meibomian gland dysfunction^{2,3}
- Demodex mites are associated with acne vulgaris, folliculitis, rosacea, seborrheic dermatitis, perioral and scalp hair loss, and basal cell carcinoma^{1,3}
- **Demodex folliculorum and Demodex brevis are the only 2 species found in humans⁵**
- The life cycle of the Demodex mite is approximately 14 to 18 days from the egg to the larval stage followed by the adult stage⁵

CLINICAL MANIFESTATIONS OF DEMODEX BLEPHARITIS



Disorders of Eyelashes

Infestation of the lash follicles can result in collarettes and may lead to malalignment, trichiasis, and madarosis



Meibomian Gland Dysfunction

Blockage leads to filling, swelling, and many enlarged glands (cysts) or infection. Chalazia are common granulomatous responses



Lid Margin Inflammation

Severe lid margin inflammation can be caused by mechanical blockage and a delayed host immune hypersensitivity reaction

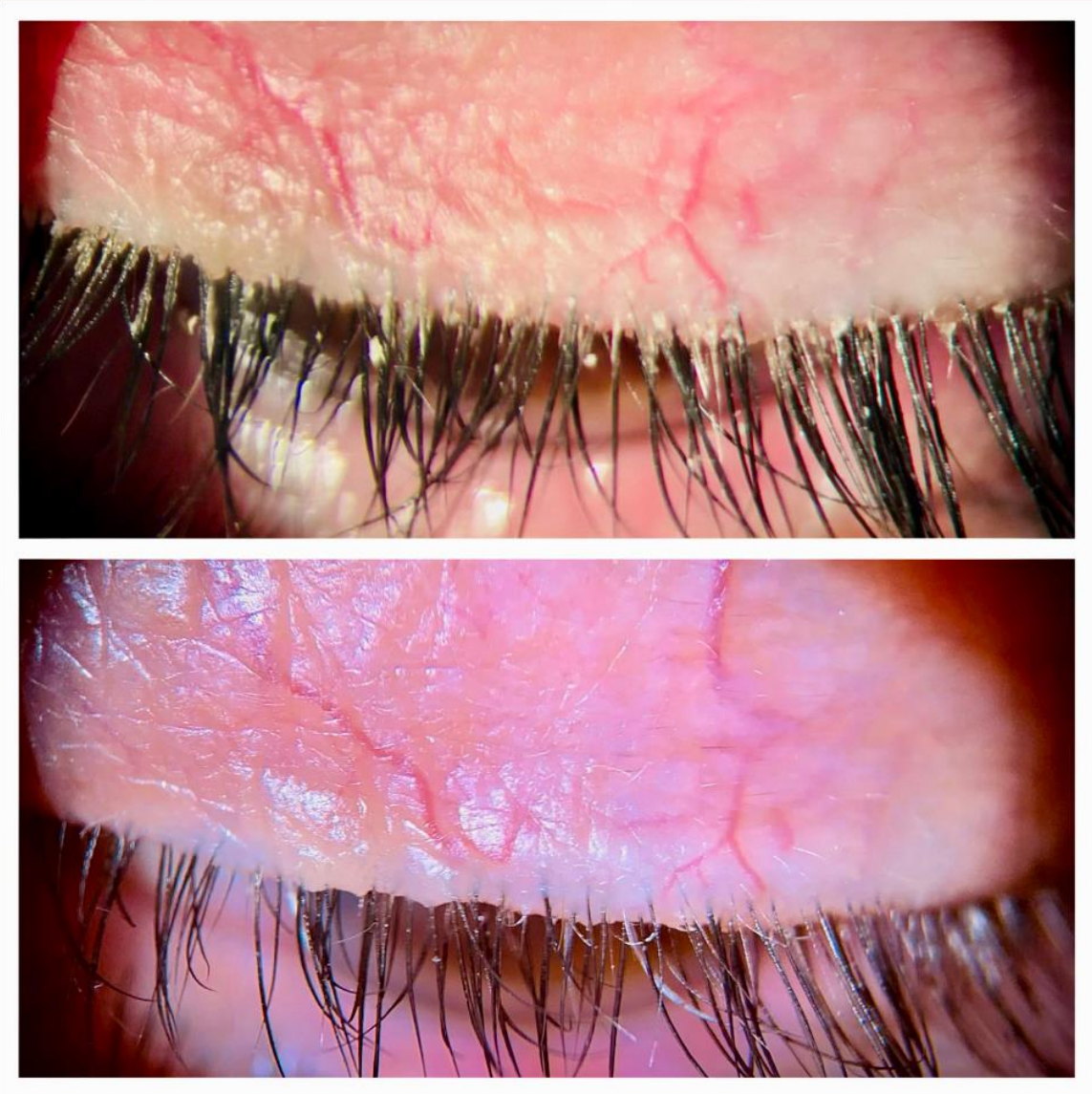


Conjunctival Inflammation

Without proper hygiene, lid margin inflammation may spread over to the conjunctiva producing a condition known as blepharoconjunctivitis

Collarettes Are a Pathognomonic Sign of Demodex Blepharitis

Collarettes, or cylindrical dandruff, are composed of mite waste products and eggs. They are translucent, solidified exudative excretions that form a cylindrical collar cuffing around the base of the eyelash follicle. Collarettes are displaced along the shaft of the lash as it grows, and they are also displaced due to bacterial overgrowth. Collarettes are composed of regurgitated undigested mite waste combined with epithelial cells, keratin, mite eggs, and secreted proteases and lipases that cause irritation. 100% of patients with collarettes have Demodex blepharitis.



MECHANISM OF ACTION OF TP-03 (Lotilaner Ophthalmic Solution 0.25%)



Is a **lipophilic agent** in an **aqueous drop*** that...



Acts specifically via mite
GABA-gated chloride channels to...



Target, paralyze, and kill *Demodex* mites

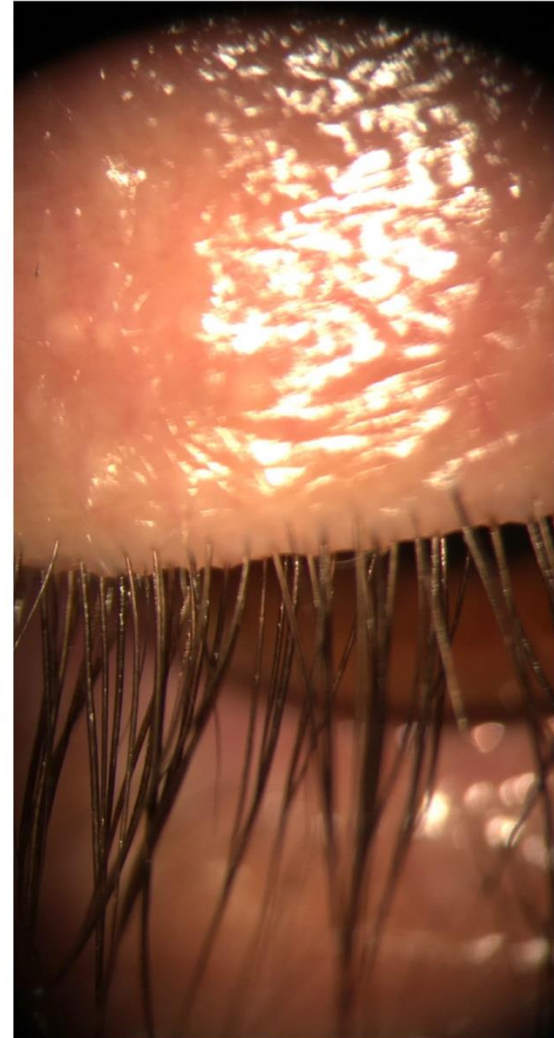
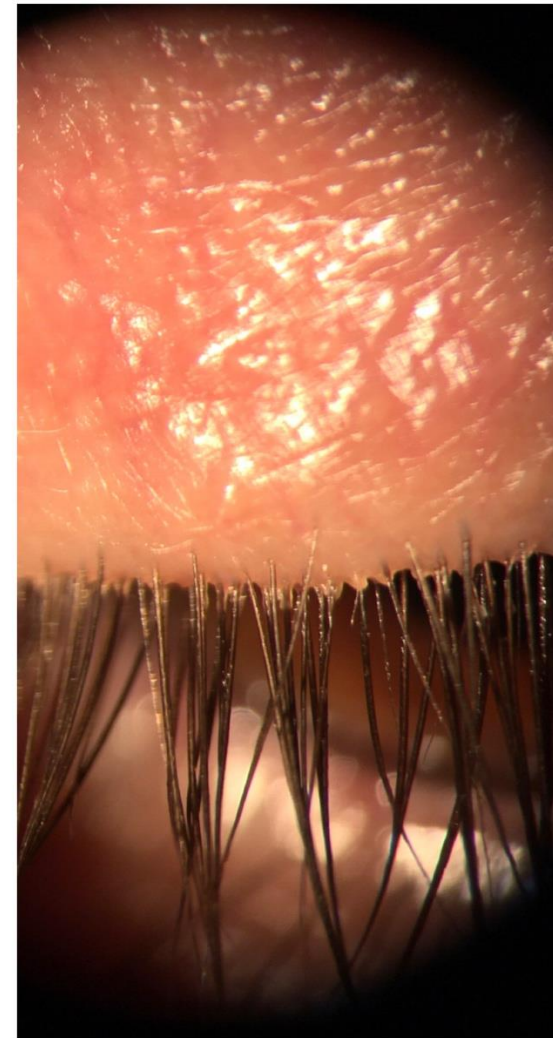
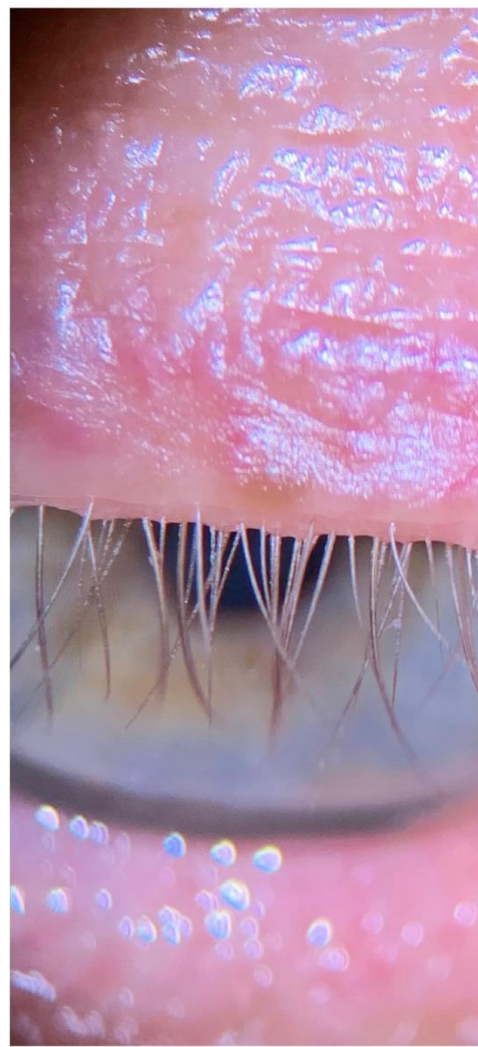
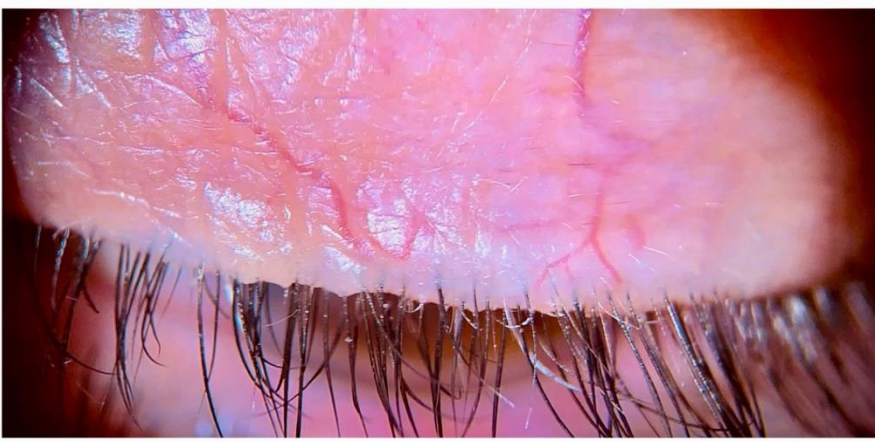
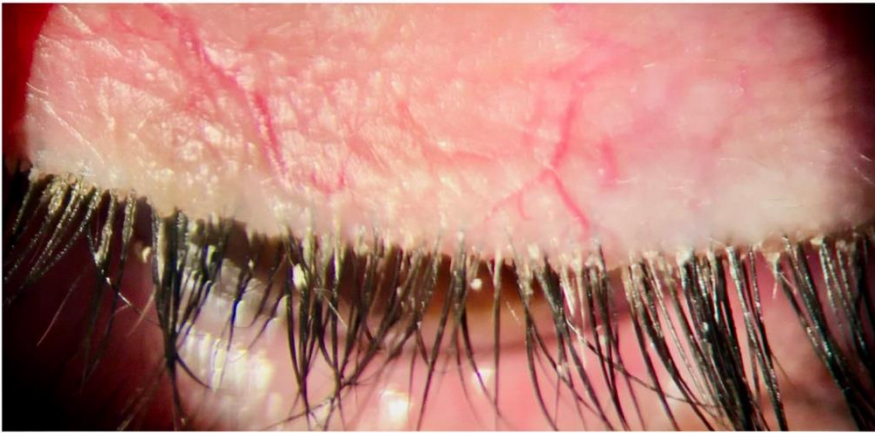
REAL RESULTS



An average of 50% of patients taking XDEMYV achieved a significant improvement in their eyelids (reduction of collarettes to no more than 2 collarettes per upper lid) at Day 43 vs 10% taking vehicle across 2 combined clinical trials (SATURN-1 and SATURN-2; XDEMYV: N=402, vehicle: N=404).⁴ All images are of actual patients who participated in clinical trials for Tarsus Pharmaceuticals.

GABA=gamma-aminobutyric acid.

*Preserved with potassium sorbate



Habits can be harmful

- Sleeping in make-up
- Tight-lining
- Not throwing make-up away in a timely fashion



Lashes and Patient Perceptions

Lashes—Not just there for adornment

Eyelashes play a crucial role in the overall appearance and health of the eyes. Proper eyelash care and maintenance can enhance the beauty and expressiveness of the face.

Patient Perceptions

Patients often have strong perceptions and expectations when it comes to the appearance of their eyes and eyelids. Understanding and addressing these perceptions is key to providing effective and satisfactory care.

Eyelash Extensions

1 The process of getting eyelash extensions

Takes 1-3 hours to glue single lashes to the natural lashes

2 Filling process

Occurs every 2-4 weeks to remove and replace old extensions

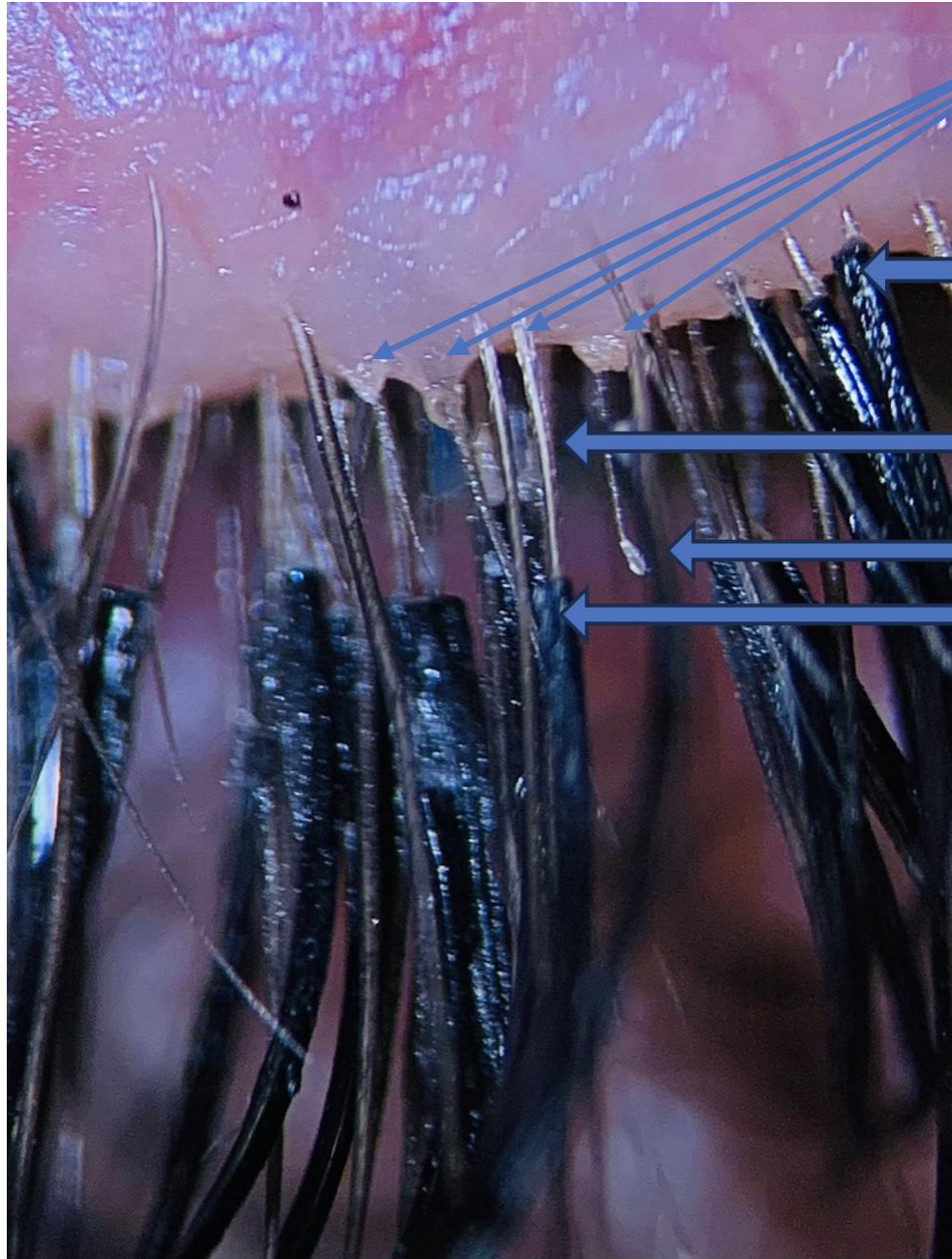
3 Average life cycle of a natural lash

Ranges from 4-11 months

4 Potential issues

The glue solvents and fragrances used during the filling process can end up on the ocular surface and may cause problems





Collarette-Pathognomonic for Demodex

Eyelash Extension

Anatomic Eyelash

Glue

Eyelash Extension

Eyelash Extension Care

The problem with eyelash extensions is that they can lead to a build up of oil, debris and infection-causing bacteria, as well as mite infestation. Many extension wearers avoid cleansing their lashes for fear of breaking down the adhesive and causing the extensions to fall out prematurely.

The solution is to use hypochlorous acid twice daily along with a clean lash brush. This not only keeps the lashes clean, but also helps them last longer.

If demodex is present then treat with lotilaner 0.25%





Glue Adhesive Formidable Formaldehydes

Cyanoacrylate-based containing latex and ammonia

Cyanoacrylate-based adhesives used in eyelash extensions often contain latex and ammonia, which can be irritating to the delicate eye area.

High formaldehyde- emitting product

Many eyelash extension adhesives contain formaldehyde-releasing preservatives like DMDM Hydantoin, ureas, and Quaternium-15, which can emit high levels of formaldehyde and cause irritation.

Sodium Hydroxymethylglycinate

This is another formaldehyde-releasing preservative that can be found in eyelash extension adhesives and pose risks to the ocular surface.

Eyelash Serums

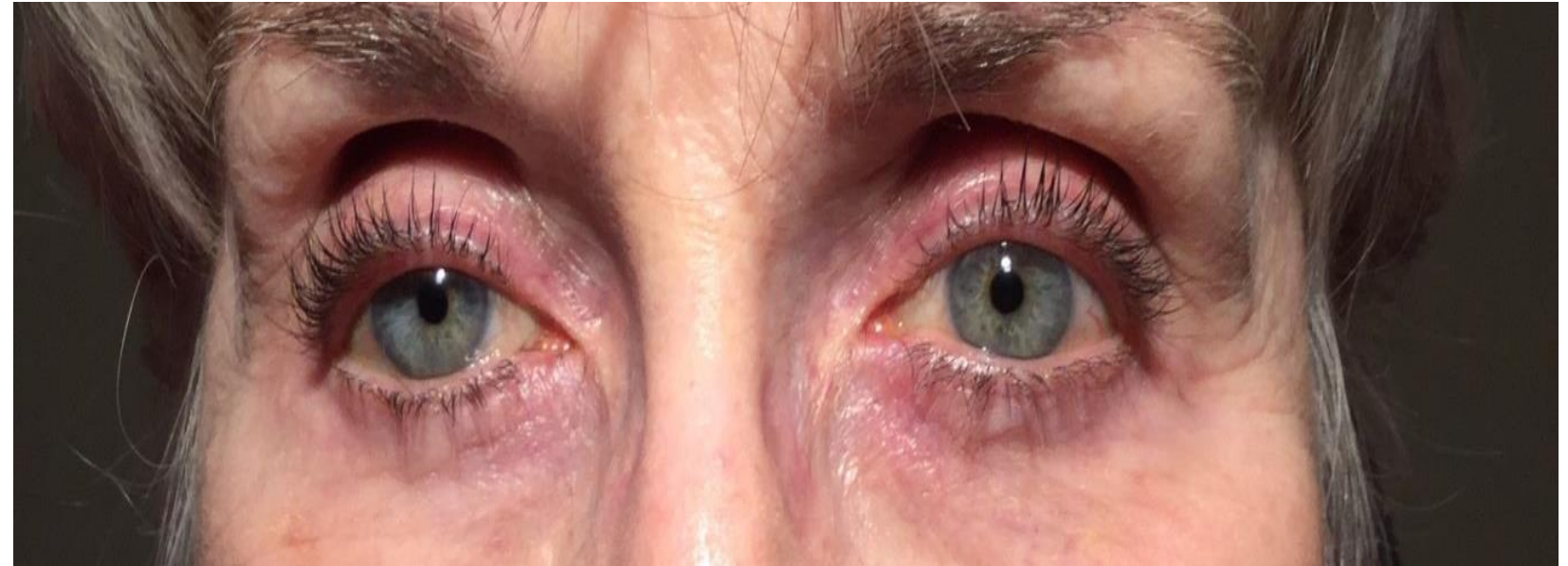
- **Latisse-only FDA approved lash serum**
- **Active ingredient:** Synthetic prostaglandins
- **Isopropyl cloprostenate**
- **Side effects:** Ptosis, Relative Enophthalmos, Inferior Scleral Show, Periorbital Fat Atrophy, Involution of dermatochalasis, Meibomian Gland Dysfunction, Hyperpigmentation, Redness, Pruritus



Mocan MC, Uzunomanoglu E, Kocabeyoglu S, Karakaya J, Irkeç M. The association of chronic topical prostaglandin analog use with meibomian gland dysfunction. J Glaucoma 2016 Sep;25(9): 770-4

Eyelash Serums

- **Latisse**-only FDA approved lash serum
- Active ingredient:
 - Synthetic prostaglandins
 - Isopropyl cloprostenate
- Potential Side Effects:
 - Ptosis
 - Relative Enophthalmos
 - Inferior Scleral Show
 - Periorbital Fat Atrophy
 - Involution of dermatochalasis
 - Meibomian Gland Dysfunction
 - Hyperpigmentation
 - Redness
 - Pruritus
- Mocan MC, Uzunomanoglu E, Kocabeyoglu S, Karakaya J, Irkec M. The association of chronic topical prostaglandin analog use with meibomian gland dysfunction. J Glaucoma 2016 Sep;25(9): 770-4



Rhytids, Laxity, and Aponeurosis

1 Rhytids

Rhytids, or wrinkles, are a common sign of aging around the eyes and face. These dynamic wrinkles are caused by repeated muscle contractions over time, leading to the formation of fine lines and creases.

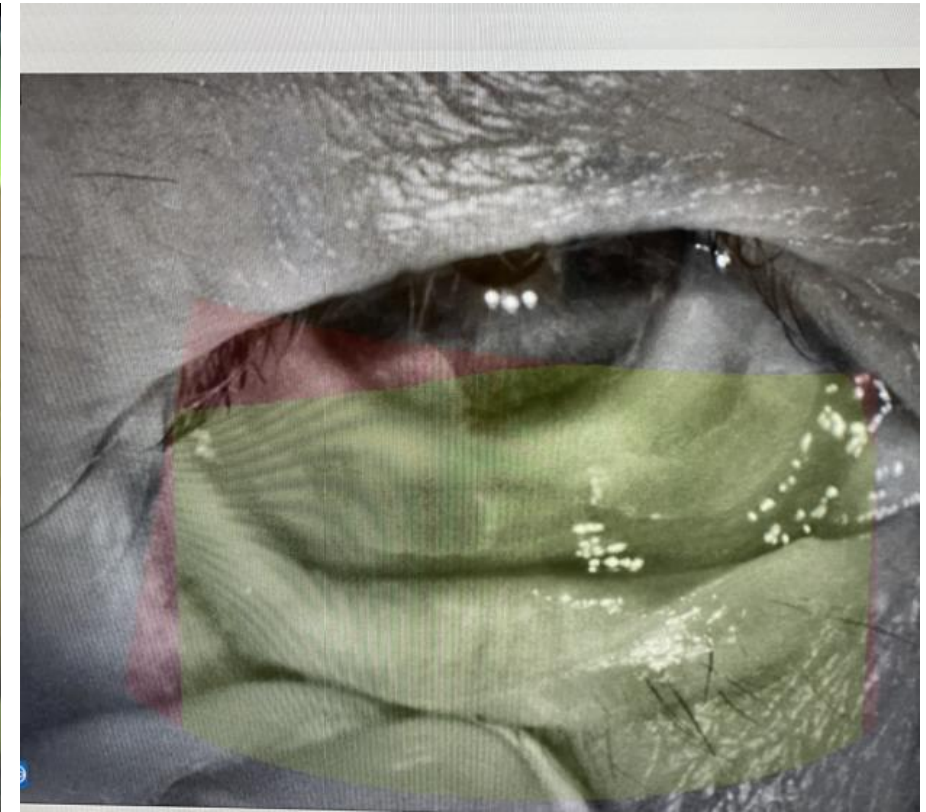
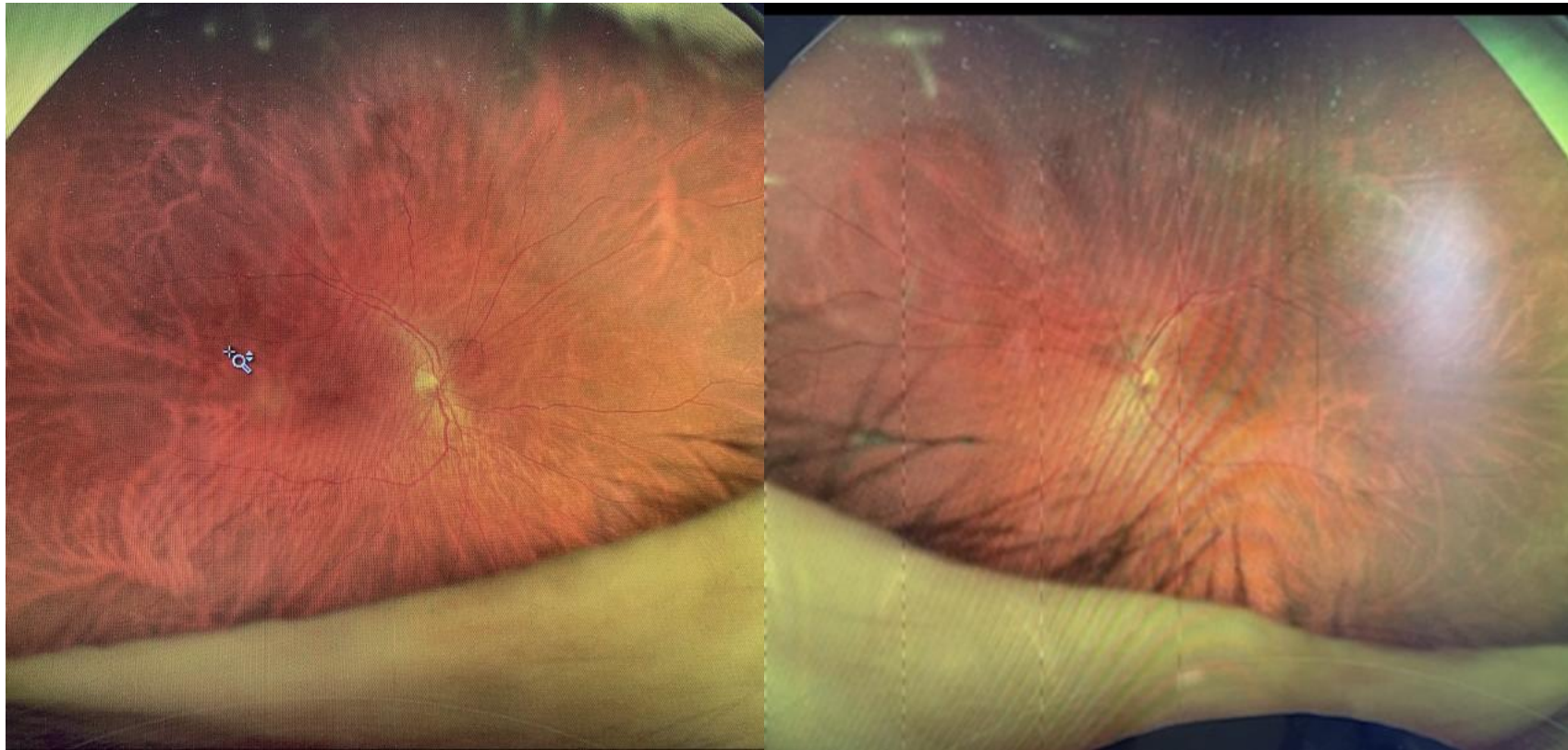
2 Laxity

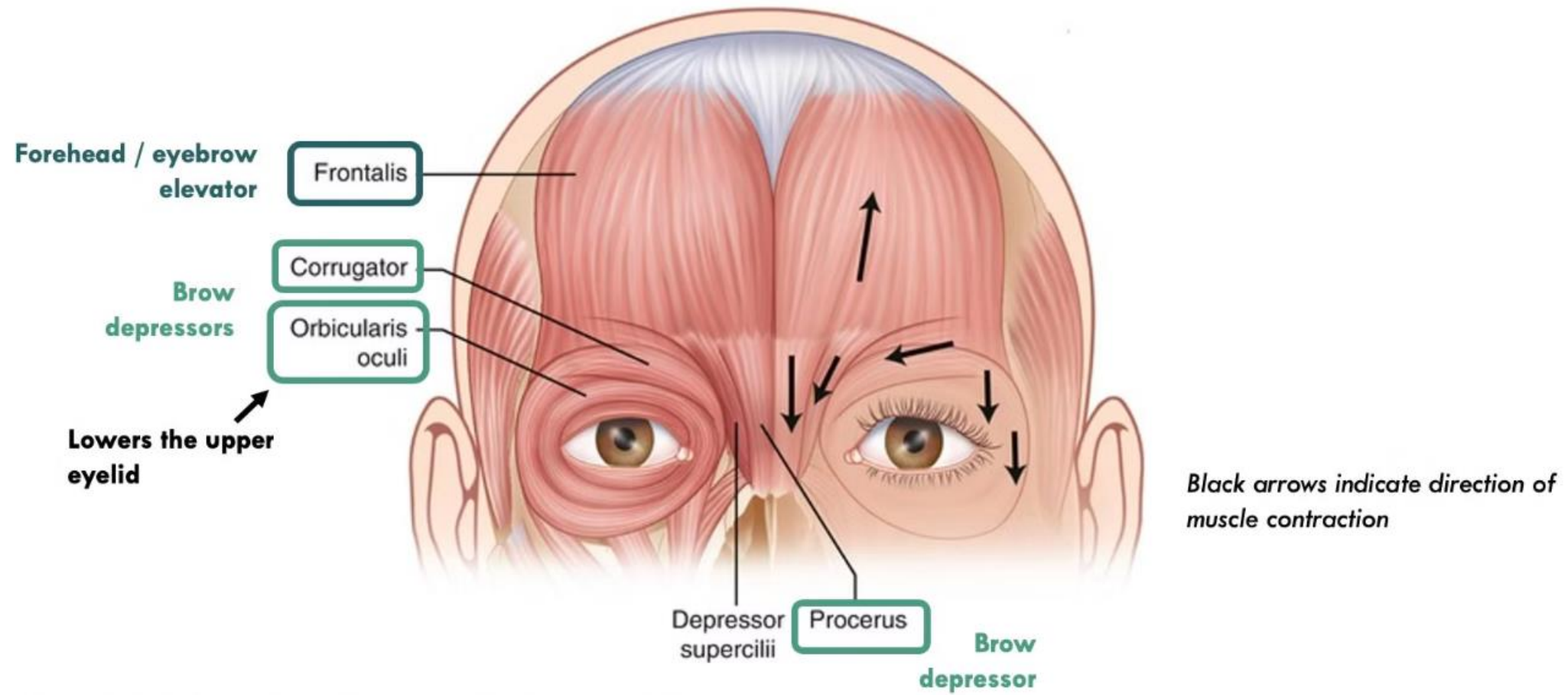
Laxity refers to the loss of skin elasticity and looseness of the tissues around the eyes and face. As we age, the skin and underlying structures lose their youthful tightness, leading to sagging, drooping, and a more aged appearance.

3 Aponeurosis

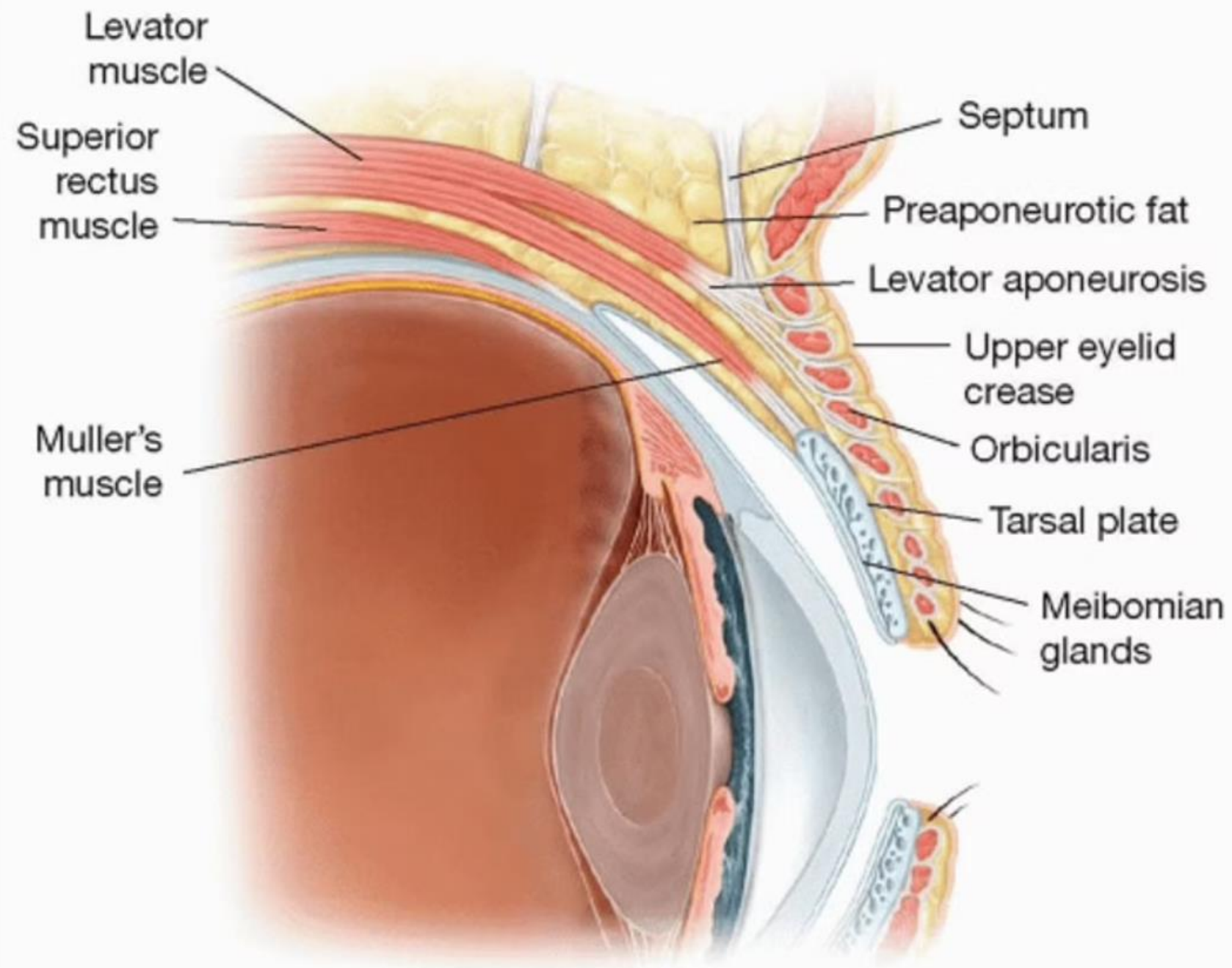
The aponeurosis is a thin, fibrous layer of tissue that connects the muscles to the skin. Changes in the aponeurosis, such as weakening or stretching, can contribute to the development of eyelid laxity and other periorbital aging concerns.

What do you notice?



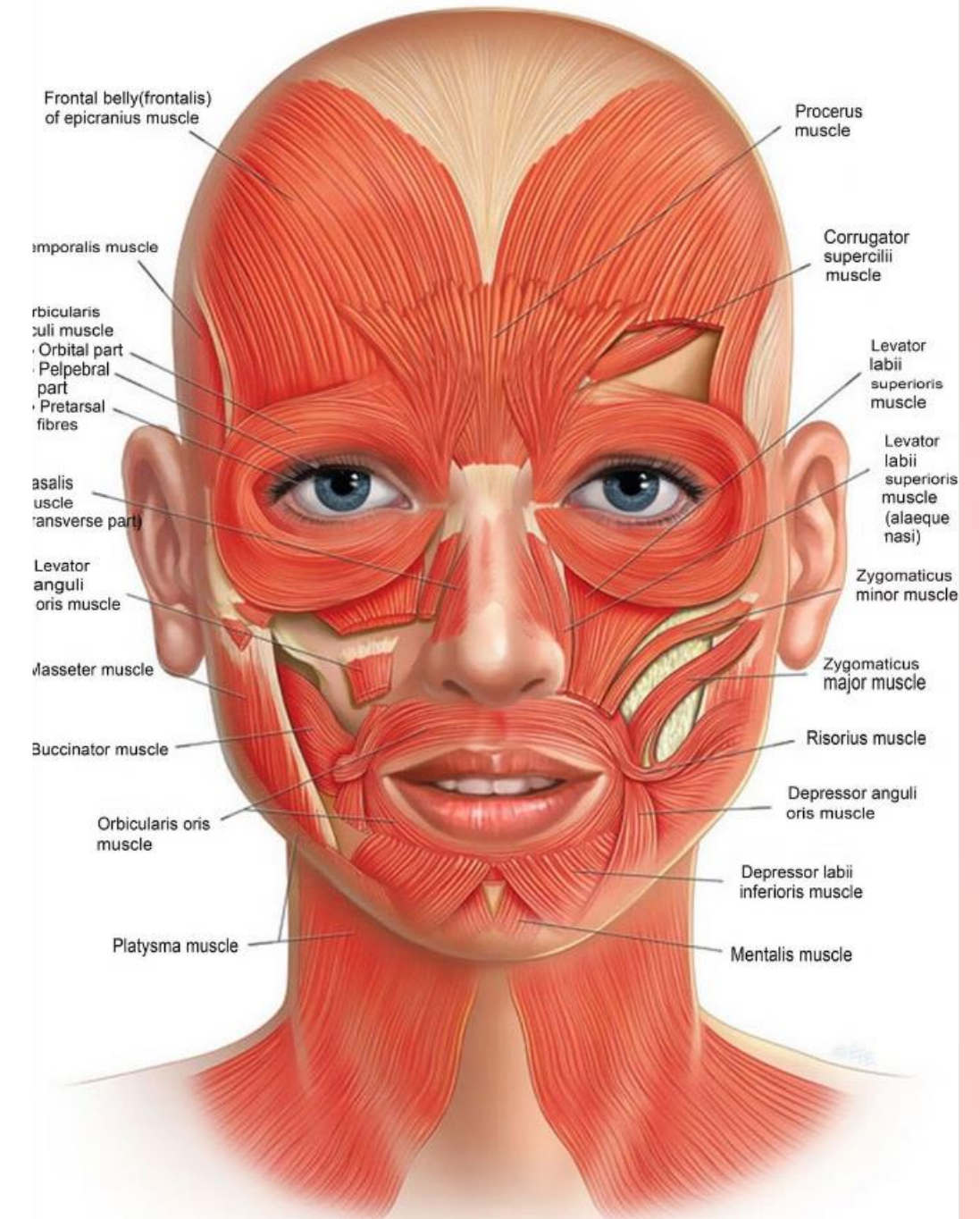


1. Massry GG. Pearls and Pitfalls in Cosmetic Oculoplastic Surgery. 2015. 2. Finsterer et al. *Aesth Plast Surg*. 2003; 27:193–204.



Brows

The brows play a crucial role in facial expression and aesthetics. Understanding the anatomy and function of the brow muscles is essential for optimizing brow appearance and enhancing overall facial harmony.



Blepharoptosis: Ptosis or “Droopy Eyelid”

- Abnormal, low-lying (drooping) upper eyelid margin with eye in primary gaze
- Unilateral or bilateral
- Severity depends on degree of lid droop
- Common eyelid disorder affecting adults of all ages, especially over 50
- Typically, slowly progressive and most often associated with aging



OXYMETAZOLINE 0.1%



38-year old female with moderate blepharoptosis in, as shown in the pre-dose image

- This subject also had marked elevation of the upper eyelids after receiving RVL-1201, as shown in the image at right, which was taken 15 minutes after RVL-1201 instillation
- Consistent with the images, evaluation of MRD-1 at this time point revealed an increase on this measure, and this was also accompanied by improvement on the LPFT

What can go wrong.

1 Eyelid Health & Habits

The eyelids are responsible for the continued health of the ocular surface and can be affected by various disease and aging processes. Eyelid Hygiene is paramount to ocular surface health.

2 Blepharoptosis

Droopy lids are more common and can be managed in a multitude of ways.

3 Lids Lumps and Bumps

Eyelids can develop benign lesions such as chalazions, skin tags, verrucae, seborrheic keratosis, cysts, and nevi.

4 Cancer

Eyelid cancers such as basal cell carcinoma, squamous cell carcinoma, malignant melanoma, and sebaceous gland carcinoma can occur.

Lids Lumps and Bumps

1. Chalazion
2. Skin tag/papilloma
3. Verrucae
4. Seborrheic Keratosis
5. Cyst of Moll & Zeiss
6. Sebaceous Cyst
7. Freckle/nevus



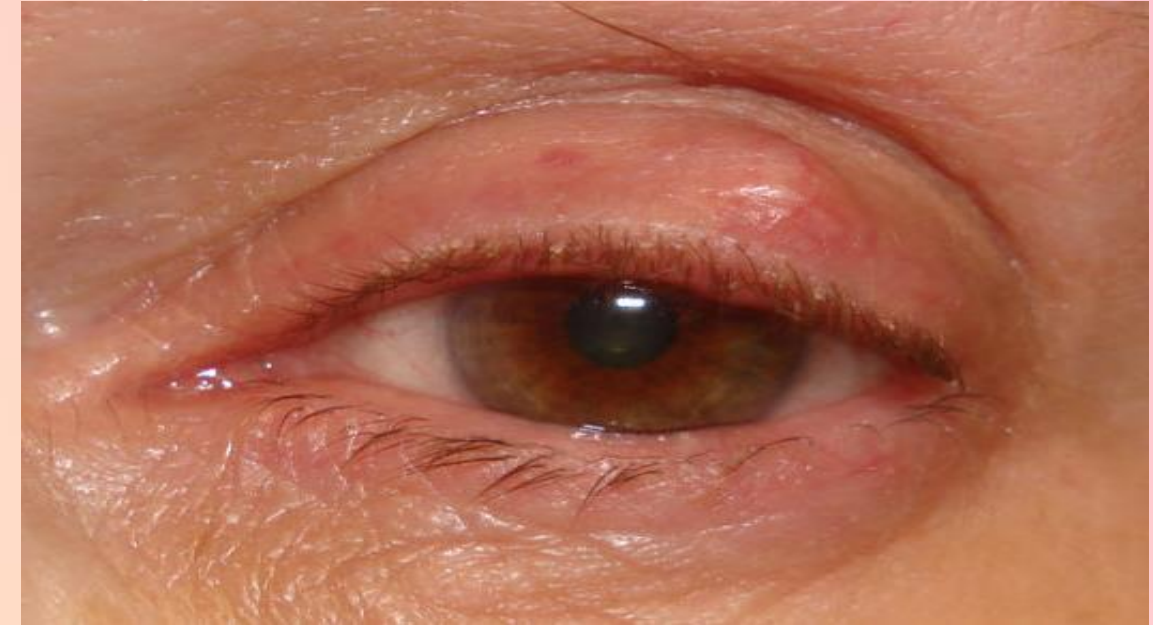
Chalazion Pathophysiology

- Obstructed meibomian gland retains sebaceous secretions
- May rupture and release lipid into surrounding tissue, causing granulomatous inflammation
- Risk factors: Rosacea, blepharitis (meibomitis)
 - Often previous episodes (but beware of same location!)



Chalazion Signs & Symptoms

- Non-tender, firm lesion
- Varying size
- Time since onset varies
- Generally contained within the tarsus
 - Not easily moveable
- No discharge with palpation
- No lash loss



Differential Diagnosis

- Hordeolum
- Sebaceous Gland Carcinoma
- Basal Cell Carcinoma
- Squamous Cell Carcinoma
- Molluscum
- Epithelial inclusion cyst
- Dermatitis
- Insect bite

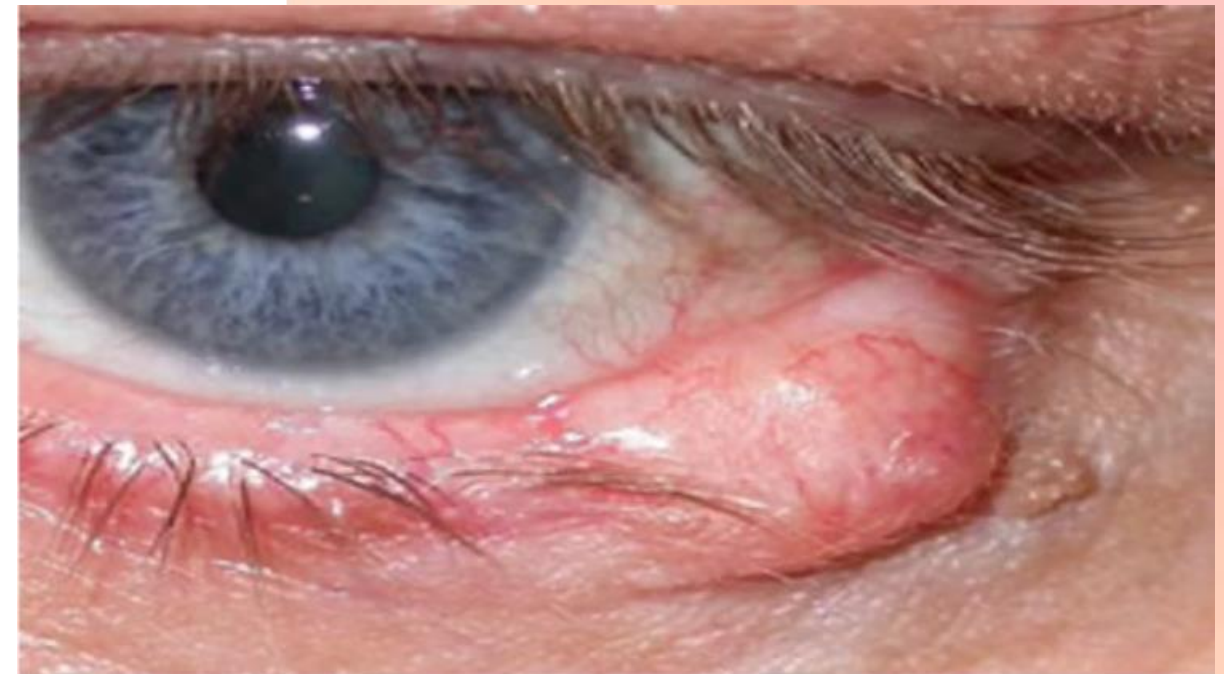
Differential Diagnosis

- Hordeolum
 - Inflamed, tender
 - May form chalazion after acute infectious phase resolves



Precursors To Cancer and Malignant Lesions

1. Actinic Keratosis
2. Keratoacanthoma
3. Basal Cell Carcinoma
4. Squamous Cell Carcinoma
5. Malignant Melanoma
6. Sebaceous Gland Carcinoma







American Academy of Dermatology

- At least SPF 30, broad spectrum (UVA and UVB), water resistant
- Chemical sunscreens work like a sponge, absorbing the sun's rays. They contain one or more of the following active ingredients: oxybenzone, avobenzone, octisalate, octocrylene, homosalate, and octinoxate. These formulations tend to be easier to rub into the skin without leaving a white residue.
- Physical sunscreens work like a shield, sitting on the surface of your skin and deflecting the sun's rays. They contain the active ingredients zinc oxide and/or titanium dioxide. Opt for this sunscreen if you have sensitive skin.
- Current FDA regulations on testing and standardization do not pertain to spray sunscreens. The agency continues to evaluate these products to ensure safety and effectiveness.

Differential Diagnosis

- Sebaceous Gland Carcinoma
 - Must be considered with in cases of recurrent chalazia
 - Strong tendency to metastasize
 - Presentations are variable
 - Lash loss



Differential Diagnosis

- Sebaceous Gland Carcinoma
 - Variable presentations
 - Be cautious!



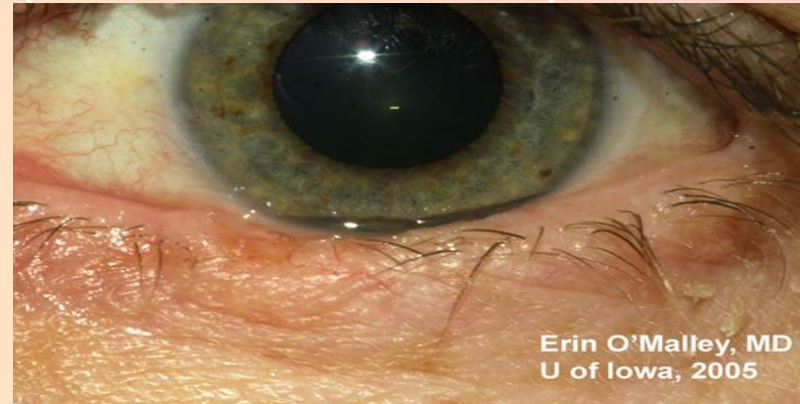
Differential Diagnosis

- Sebaceous Gland Carcinoma



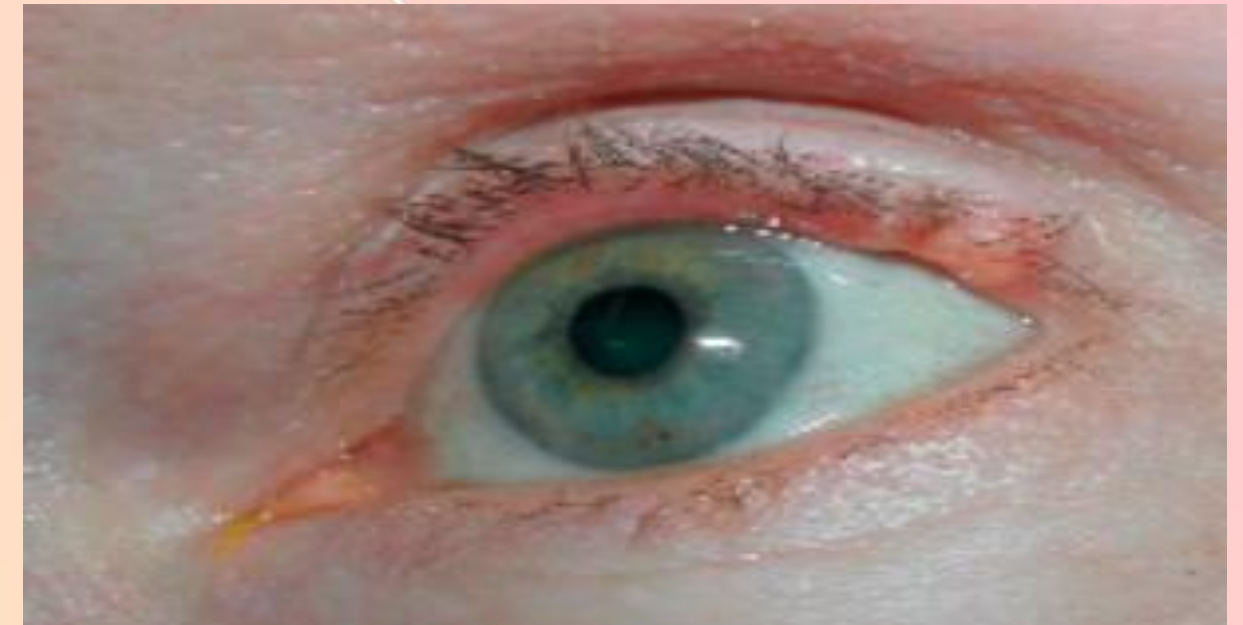
Differential Diagnosis

- Basal Cell Carcinoma
 - 90% of eyelid malignancies
 - Most commonly lower lid
 - Ulcerated with raised, pearly borders
 - Lash loss
 - Rarely metastatic



Differential Diagnosis

- Squamous Cell Carcinoma
 - 2nd-3rd most common eyelid malignancy (~5%)
 - Variable presentations
 - Difficult to diagnose clinically
 - Nodular
 - Irregular rolled edges
 - Central ulceration



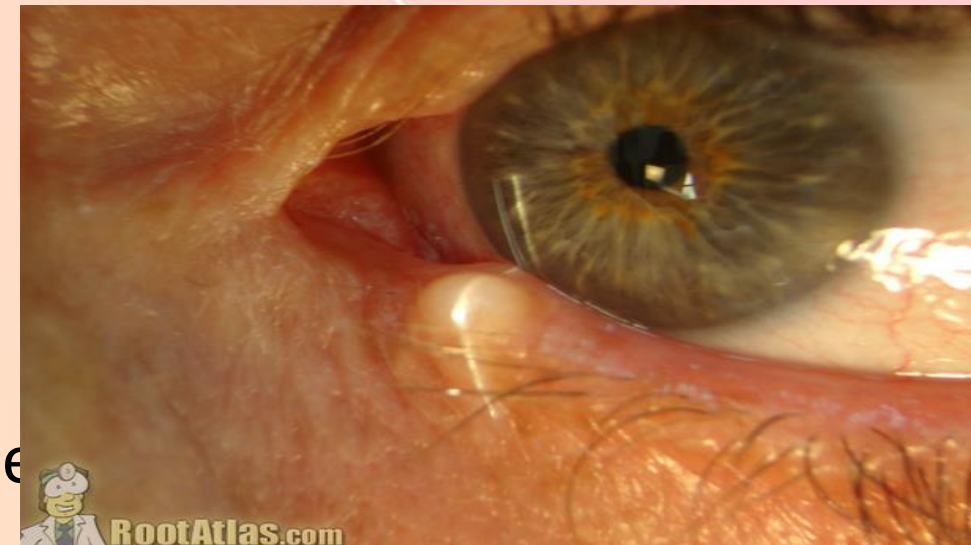
Differential Diagnosis

- Molluscum Contagiosum
 - Waxy, nodular appearance
 - Central umbilication
 - Viral cause



Differential Diagnosis

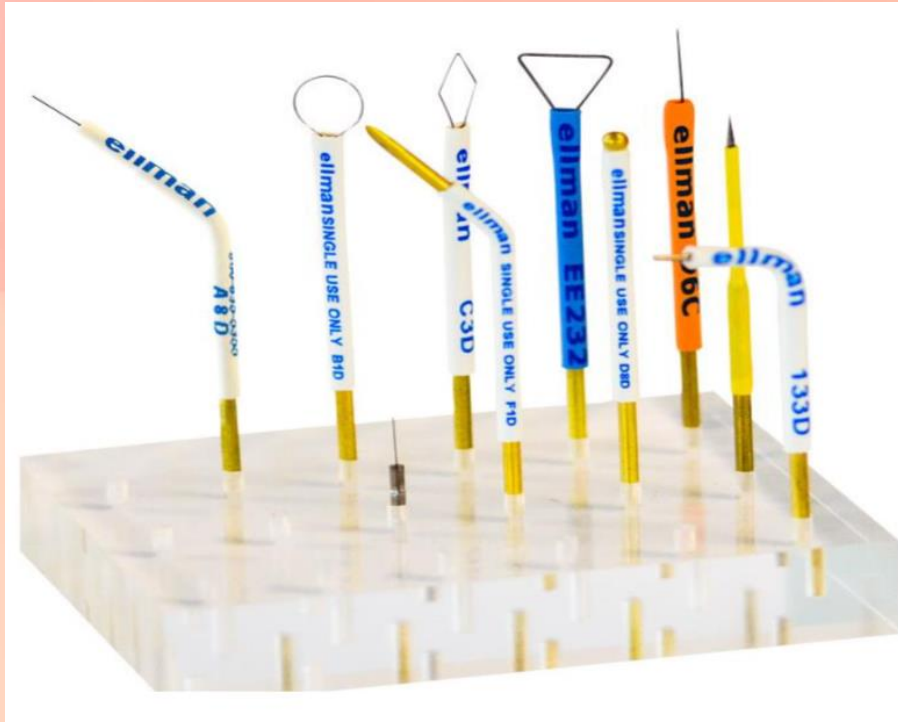
- Epidermal Inclusion Cyst
 - Benign
 - Filled with keratin
 - Excised and expressed
 - Removal of intact cyst wall minimizes recurrence



Differential Diagnosis

- Inflammation
 - Dermatitis
 - Insect bite
- Itch
- Soft edema



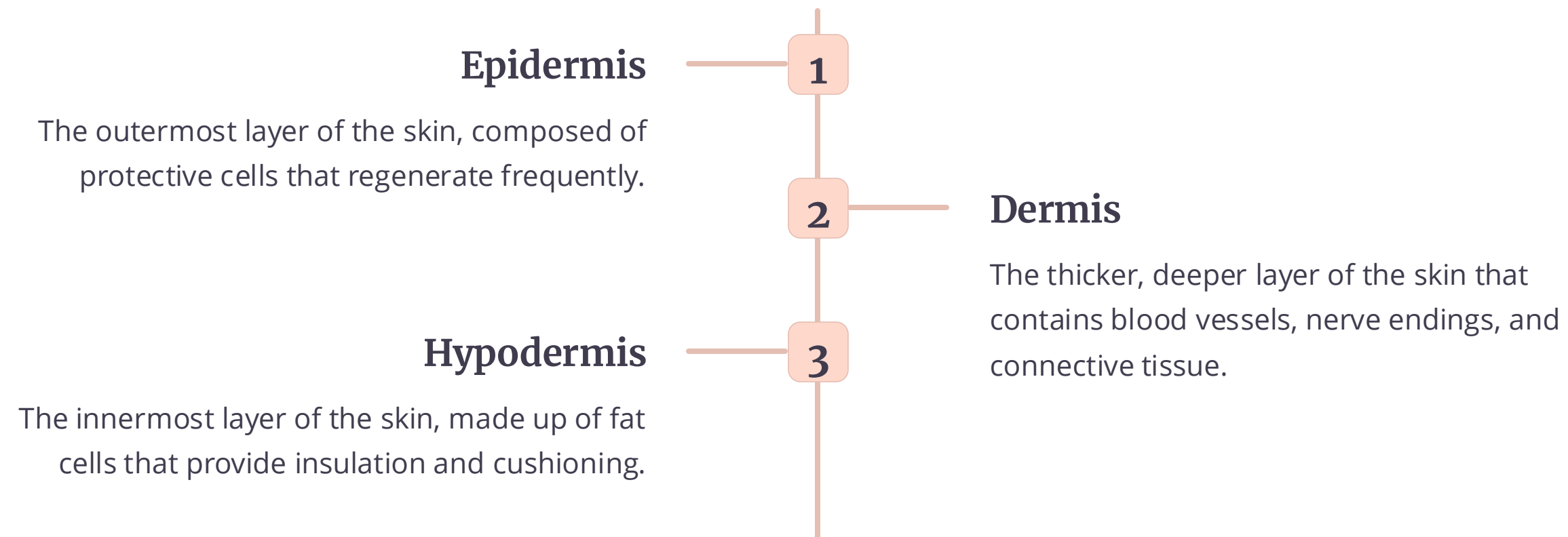


RadioFrequency

1. Surgical handpieces
2. Skin tightening handpieces

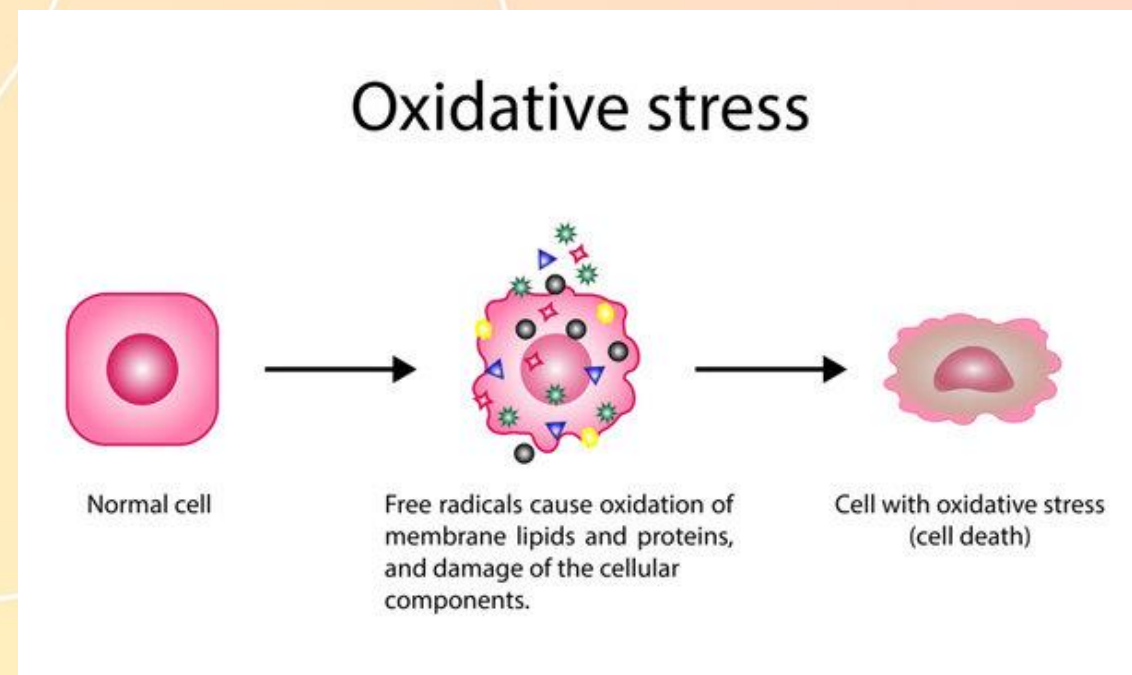


Skin Fundamentals



ROS-Reactive Oxygen species

- While the aging process is still not well understood, there is a wide agreement that oxidative stress plays a role.
- Oxidative stress does in fact increase with age and has been linked to dry eye disease. Oxidative stress happens when an imbalance between the generation of free radicals and the ability of antioxidants to neutralize them occurs. During this imbalance, reactive oxygen species (ROS) are produced.
- It's not just aging that is a risk factor, it's also cigarette smoke, low humidity, sunlight (UV radiation), pollutants, autoimmune diseases like Sjogren's, Lupus, rheumatoid arthritis, and also certain preservatives (like BAK.)





Topicals

- **Vitamin C** - Available in 10%, 15%, and 20% concentrations, vitamin C is a powerful antioxidant that helps build collagen and protect the skin from environmental stressors.
- **Vitamin E** - Another important antioxidant that works synergistically with vitamin C to neutralize free radicals and support healthy skin.
- **Ferulic Acid** - This potent antioxidant enhances the efficacy of vitamins C and E, providing even greater protection against oxidative damage.
- **Phloretin** - A plant-derived compound that helps even skin tone, reduce the appearance of fine lines and wrinkles, and provide broad-spectrum protection.
- **Building Collagen** - Topical products containing ingredients like retinoids, peptides, and growth factors can help stimulate collagen production for firmer, more youthful-looking skin.
- **Cosmeceuticals** - This category of skincare products combines cosmetic and pharmaceutical ingredients to target specific skin concerns, often with clinical-grade formulations.

RadioFrequency

1

RF

Monopolar, Bipolar,
Tripolar

2

Benefits

Improve fine lines,
wrinkles

3

Non-invasive

Targeting Dermal layer of skin
Heat to 42 degrees Celcius



Intense Pulsed Light (IPL)

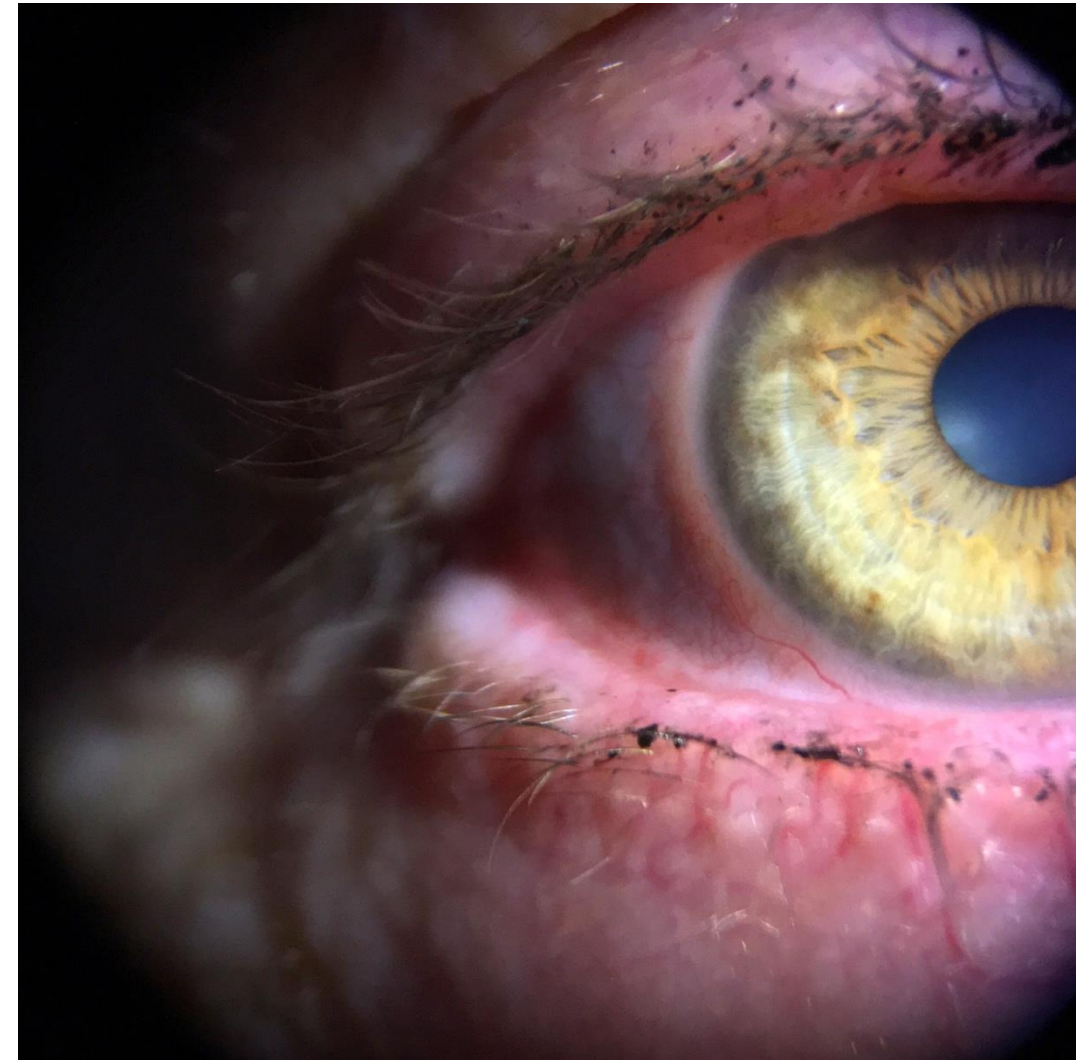
1 MGD, Rosacea

2 Benefits

Target Chromophore:
Oxyhemoglobin, Melanin

3 Non-invasive

Skin Types I, II, III easily, IV carefully, V rarely, VI-neverly☺



Non-ablative Lasers

1

Non-ablative lasers

They target the deeper layers of the skin

3

No damage to surface

Does not remove the top layer of skin

2

Benefits

Improve fine lines, wrinkles, and imperfections



Ablative Lasers (2940nm, CO2)

Ablative lasers, such as the 2940nm erbium and CO2 lasers, work by vaporizing the top layers of the skin. This process removes damaged or aged skin, stimulating the body's natural healing response to produce new, healthier skin. These powerful lasers can effectively treat a variety of skin concerns, including wrinkles, sun damage, and scarring.



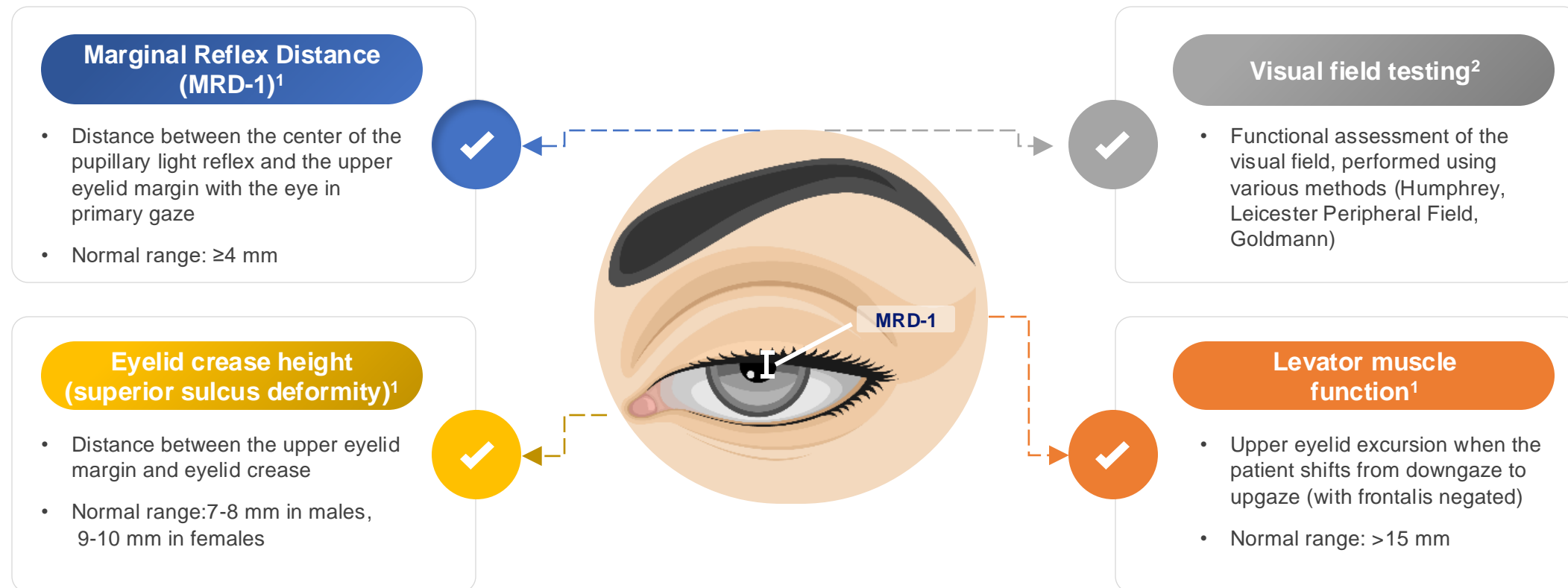
Kami Parsa, MD

Surgical Oculoplastic Procedures and Co-Management



Optometrists play a key role in the co-management of surgical oculoplastic procedures, working closely with oculoplastic surgeons to provide comprehensive care for patients. This section will explore the various surgical procedures and the optometrist's role in the process.

Methods For Evaluating the Ptotic Upper Eyelid



1. Klejch W, Vislislis JM, Allen RC. A primer on ptosis. Available at: <http://webeye.ophth.uiowa.edu/eyeforum/tutorial/s/Ptosis/index.htm>. Accessed September 27, 2019. 2. Ho SF, Morawski A, Sampath R, Burns J. Modified visual field test for ptosis surgery (Leicester Peripheral Field Test). *Eye*. 2011;25:365-369

Acquired Ptosis Evaluation

- MRD 1
- Eyelid crease height
- Palpebral fissure height
- Levator function
- Mullers function via phenylephrine
- Visual field testing to measure functional deficits

Marginal Reflex Distance 1 (MRD 1)

Distance from LID MARGIN to CORNEAL LIGHT REFLEX



- Easily defined by a penlight
- Normal MRD 1 = 4-5 mm
 - A decrease in this measure signals ptosis
- Difference in MRD 1 between two eyes classifies ptosis:
 - Mild = 2 mm
 - Moderate = 3 mm
 - Severe = 4 mm

Can you see
the twinkle
in their eye?

Range of MRD-1



Normal



Mild



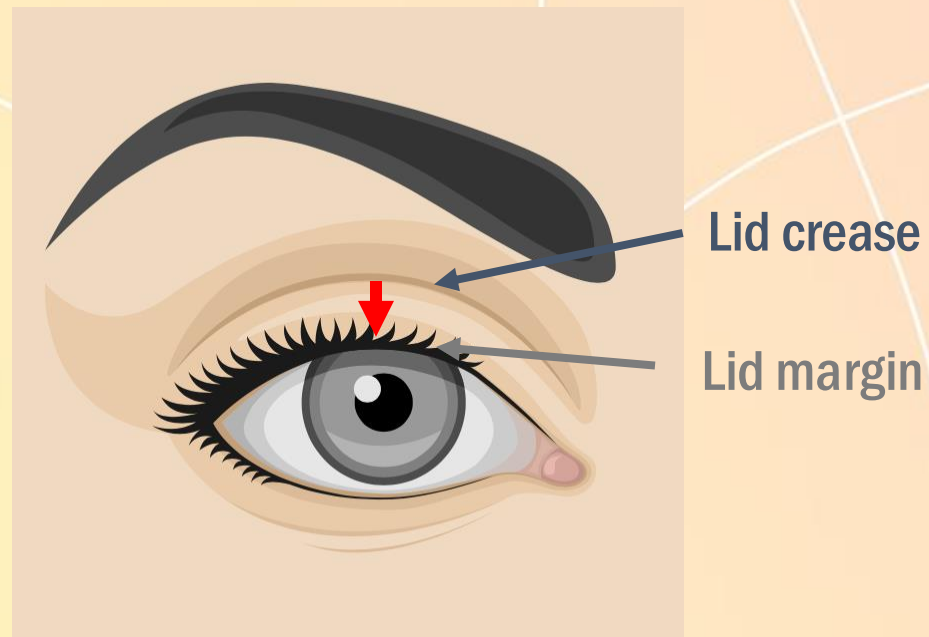
Moderate



Severe

Eyelid Crease Height / Marginal Crease Distance (MCD)

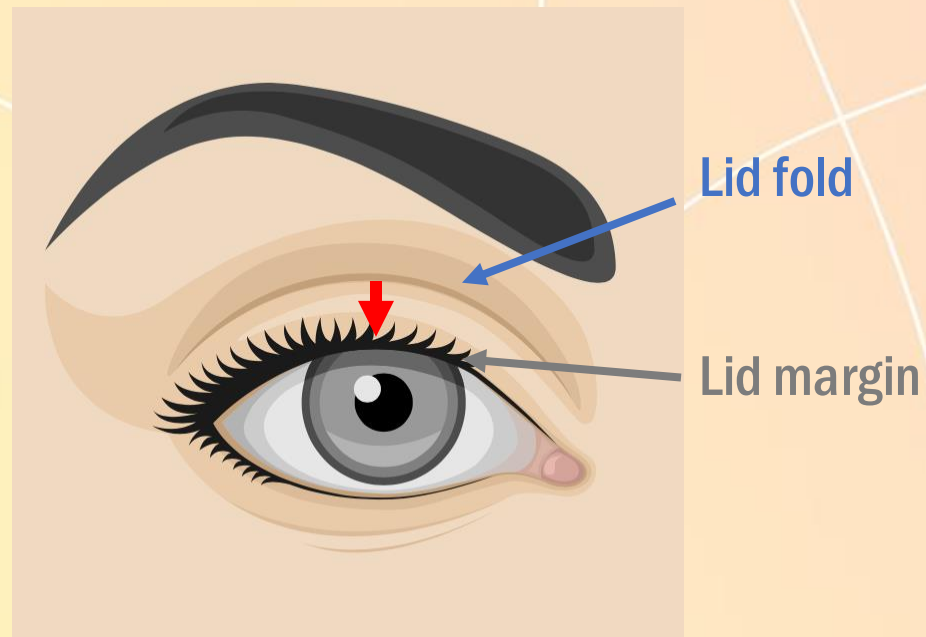
MCD = Distance between LID MARGIN and LID CREASE



- **Normal MCD:**
 - 8-9 mm in men
 - 10-11 mm in women
 - Can vary by race
 - MCD is higher than normal in aponeurotic ptosis

Lid Platform or Tarsal Plate Show (TPS)

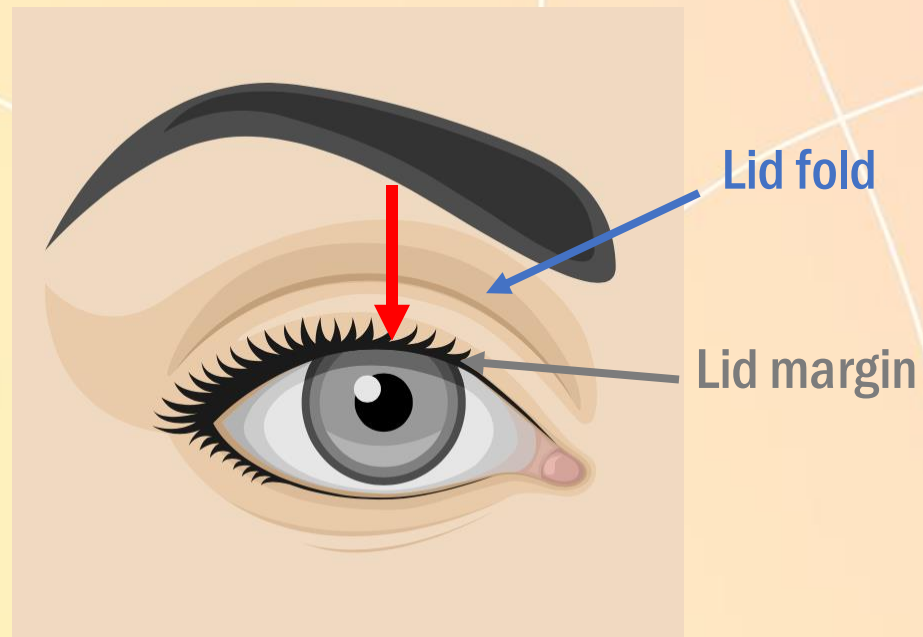
TPS = Distance between LID FOLD and LID MARGIN



- Attractive eyes exhibit less TPS¹
- Increased TPS is associated with higher perceived age, tiredness, and sadness²
- **Lifting the upper eyelid decreases TPS**

Upper Eyelid Height (UEH)

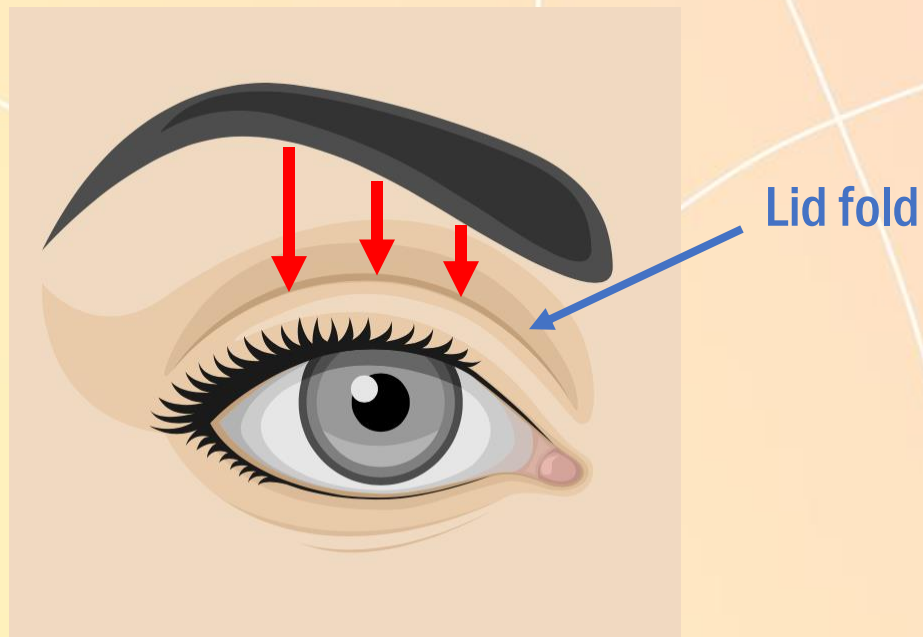
UEH = Distance between lower brow border to center of lid margin



- Attractive eyes exhibit lower UEH
 - Evidence that correlation holds across ethnicities
- Neuromodulator injections that lift the brow increase UEH, often creating an undesirable look
- **Lifting the upper eyelid decreases UEH**

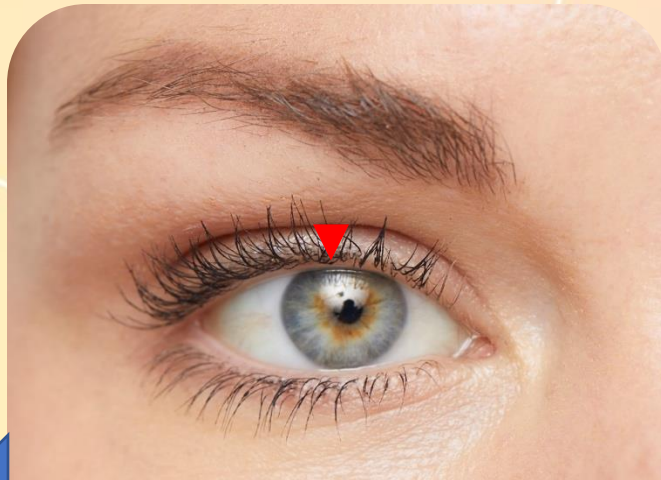
Brow Platform or Brow Fat Span (BFS)

BFS = Distance from the lid fold to inferior brow

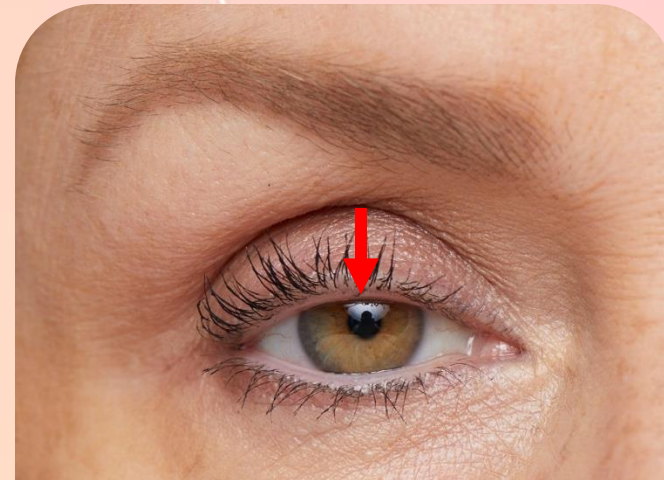
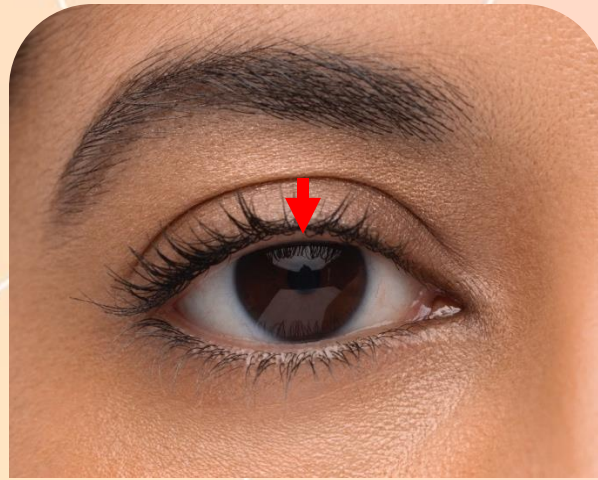


- Assessment of **symmetry**
- Medial to lateral **alignment**
 - Apex aligned approximately above corneal limbus
 - medial edge aligned on the same vertical line as the lateral nasal ala and inner canthus

Variation in Lid Platform



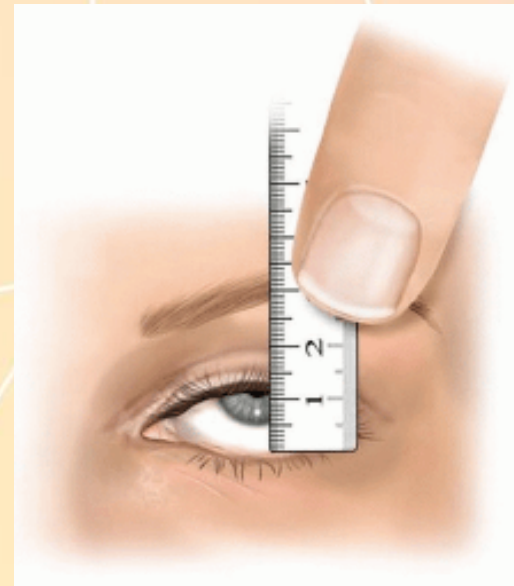
SMALL LID PLATFORM



LARGE LID PLATFORM

Levator Function

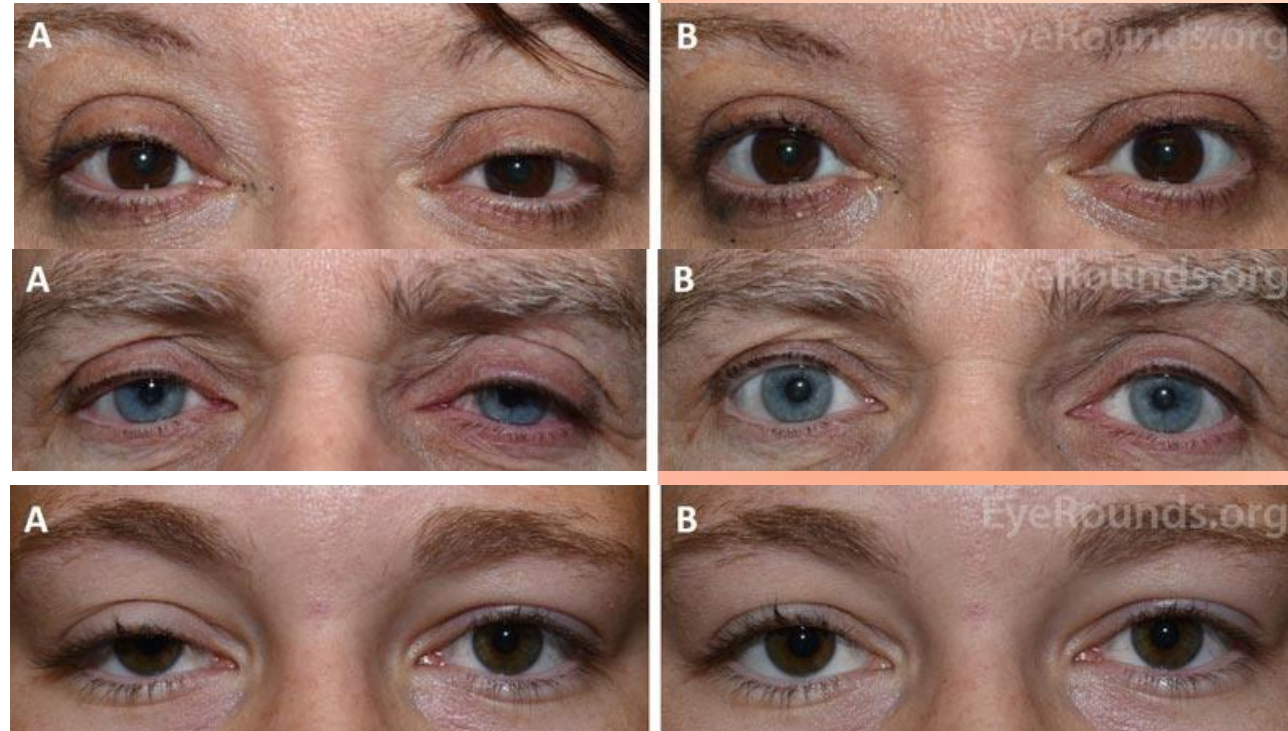
Distance between excursion of upper lid margin from full downgaze to full upgaze without brow movement



Excellent	>10 mm	
Good	8-10 mm	Mild Ptosis
Fair	5-7 mm	Moderate Ptosis
Poor	1-4 mm	Severe Ptosis

Ptosis Repair

1. Levator repair
2. Mueller's repair
3. Phenylephrine Test



Lower Blepharoplasty

–Transconjunctival

- Good for predominantly fat herniation (combined with laser resurfacing)

–Transcutaneous

- Good for excess skin
- along with fat herniation



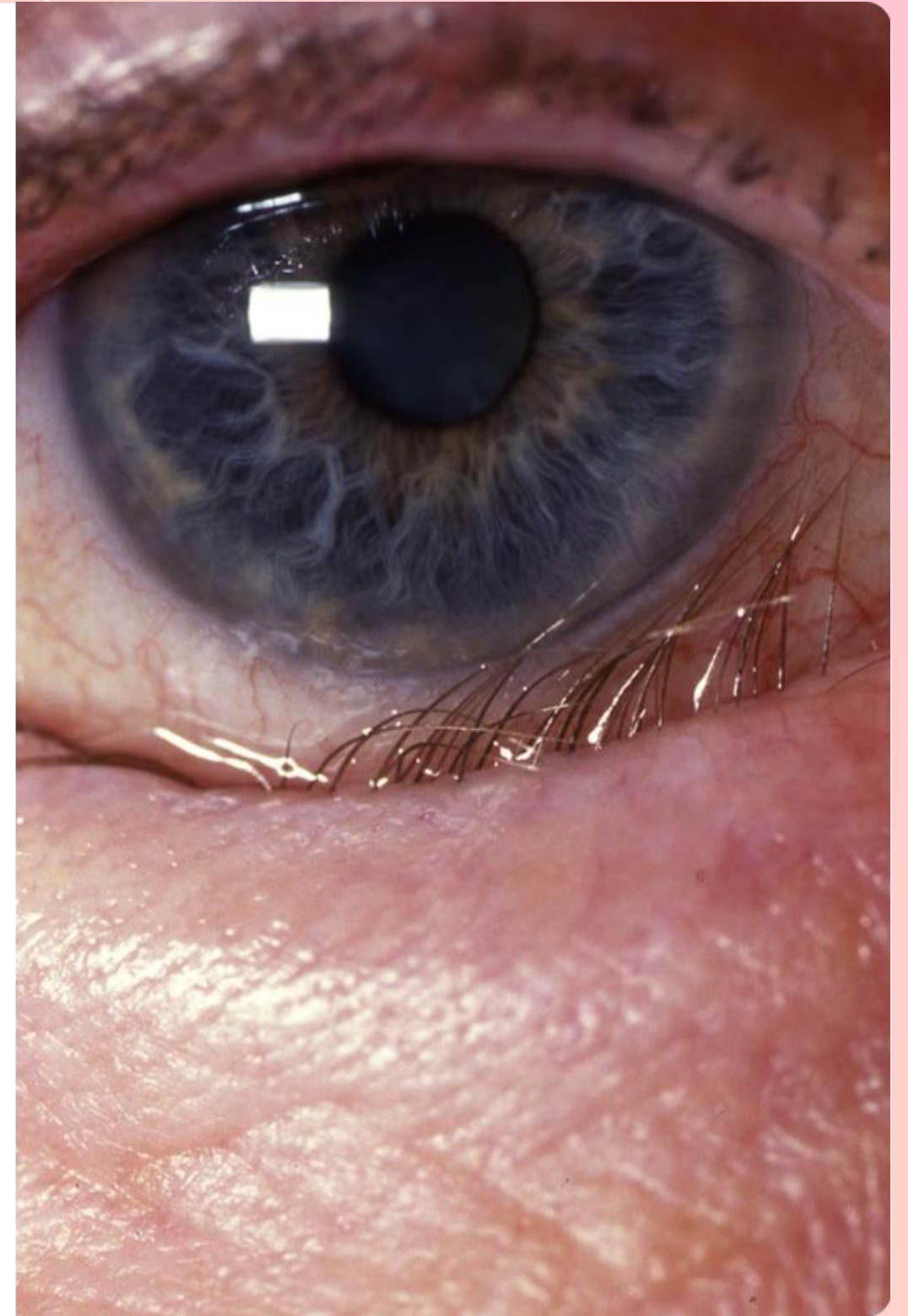
Ectropian

1. Lateral Strip Tarsorrhaphy



Entropion

Entropion is a condition where the eyelid turns inward, causing the eyelashes to rub against the eye. This can lead to irritation, redness, and even vision problems if left untreated.



Brow Lift

The brow lift, also known as a forehead lift, is a surgical procedure that can help improve the appearance of the brow and forehead area. This procedure can address issues such as a low or sagging brow, wrinkles, and frown lines.

Endoscopic – Full forehead elevation via fixation posts (with or without suture)

Pros: no visible incision / scarring

Cons: expensive, ~5yr duration, 'surprised' look

Direct – direct excision of excess tissue

Pros: insurance often covers, long-lasting, minimal to no scarring if done properly

Cons: Scarring is occasionally unavoidable, numbness

BrowPexy

The brow pexy, or brow lift, is a surgical procedure that can help address issues with drooping or sagging eyebrows. This technique involves repositioning the brow to a more youthful and aesthetically pleasing position.

Elevate & stabilize brow by fixating to underlying periosteum
Often done along with upper blepharoplasty
No scar incision, but may lose effectiveness as tendons change (~10 yrs)

Educate & Evolve the Eyelid Examination

- Look. Ask.- Ask.Look.
- Talk to your patients!!
- Offer education
- Offer solutions



Thank you!



Email

drmcgee@bespokevision.org



Social

@drselinamcgee

@bespokevisionok