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- Vision Stage – *Tangerine Ballroom – Room WF1*
Our Vision Stage sessions feature free, promotional content for all attendees.
- Vision Series - *Thursday 3/12 and Friday 3/13*
Grab a bite to eat and continue learning over *Breakfast 8:30-9:30am* or *Lunch 12:00-1:00pm!**
Listen to industry leaders as they address the latest clinical innovations in a relaxed and collaborative environment.

**Open to Optometrists only. Not for Credit. Meals offered on first-come, first-serve basis. Education Badge required.*

- Exhibit Hall Hours
Thursday, March 12 9:30am – 6:00pm
Friday, March 13 9:30am – 6:00pm
Saturday, March 14 9:30am – 3:00pm
- Conferee Cafe – Exhibit Hall – Booth 2902
- Education Lounge - Level 2 - Conference Area
Tangerine Ballroom – Room WF2

On behalf of Vision Expo, we sincerely thank you for being with us this year.

Reminder to Complete Your Session Evaluations!

Please be sure to complete your digital session evaluations for each course you attended! Your feedback is important to us as our Education Planning Committee considers content and speakers for future meetings to provide you with the best education possible.



Differentiating Keratitis

Pamela Theriot, OD, FAAO

Author, TEDx Speaker, TFOS Lifestyle
Workshop

Financial Disclosures

Pamela Theriot is on the Speaker or Consultant for the following companies:

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Tear Film and Ocular Surface Society,
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Pam Theriot, OD, FAAO

- Lusk Eye Specialists
 - Clinical Director of Dry Eye Relief Center
- TFOS Lifestyle Workshop:
 - Public Awareness committee Member
- TEDx Grandview Heights – January 2025
 - 3 Tips to Preserve your Vision
- 2026 Dry Eye Columnist
 - Optometric Management
- Author
 - Alleviate Dry Eye
- Website / Blog / Courses
 - www.pamtheriot.com



Learning Objectives

Keratitis can be hard to differentiate and Diagnose

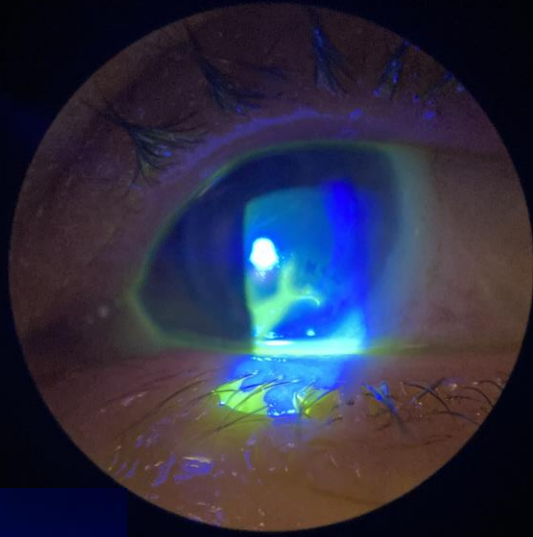
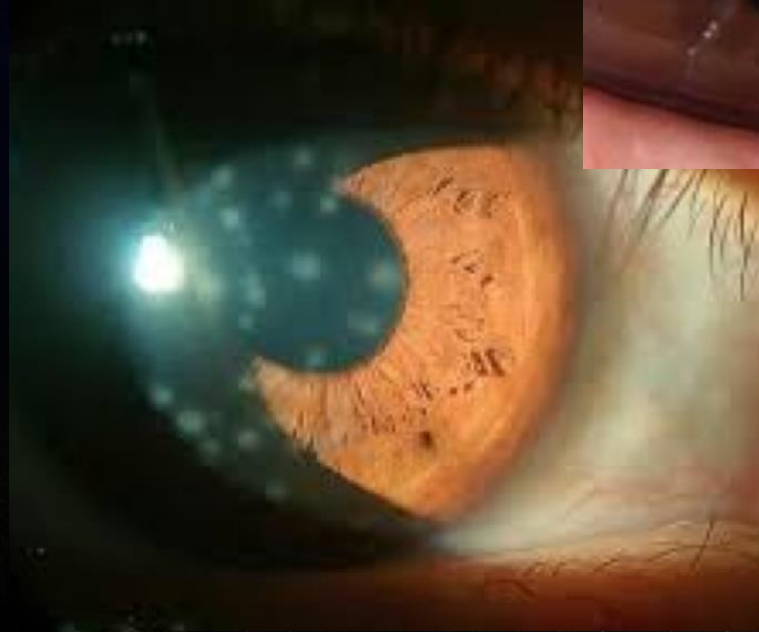
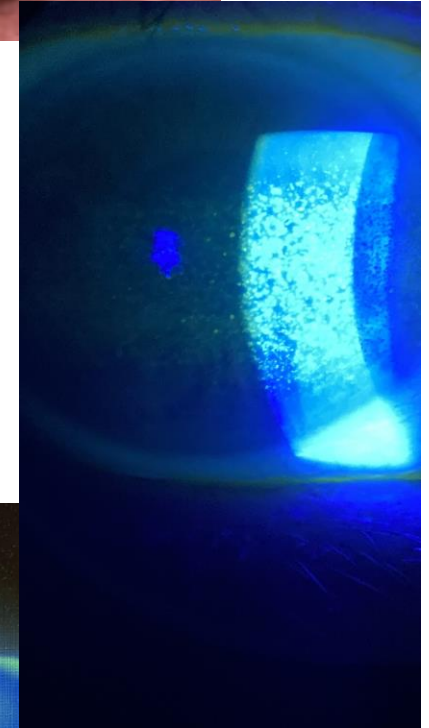
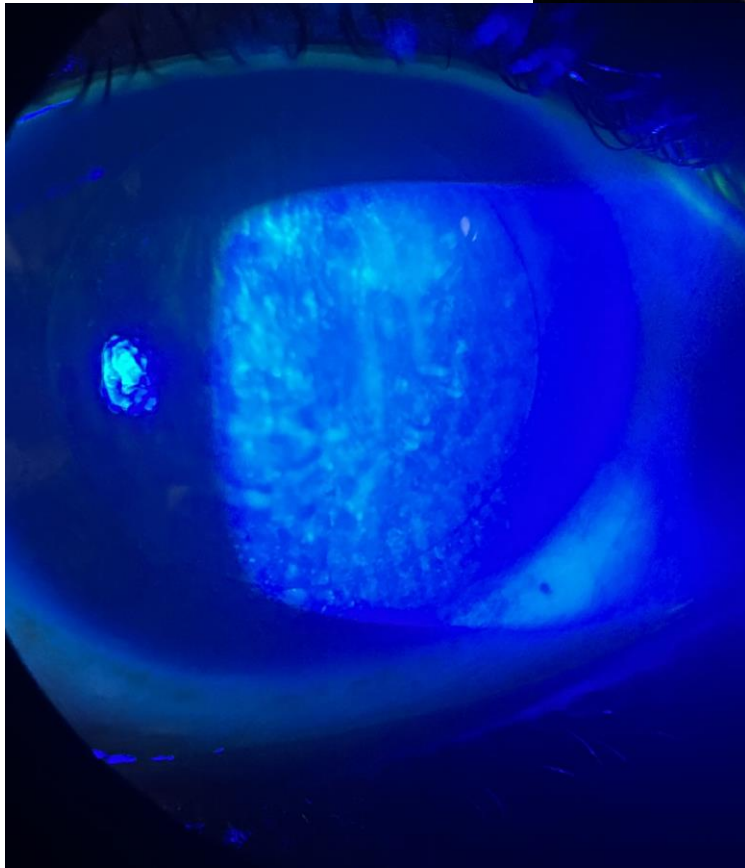
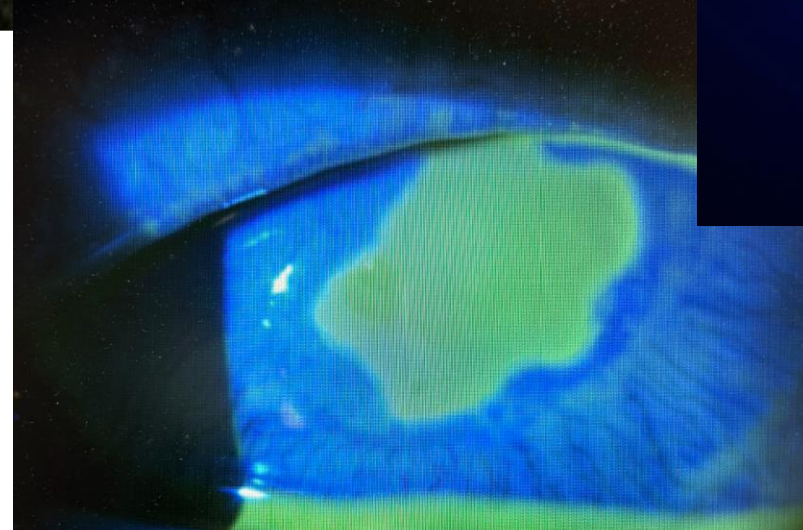
Thygesons Keratitis (TSPK), Staph Marginal Keratitis (SMK), Neurotrophic Keratitis (NK), Filamentary Keratitis (FK), Herpes Simplex (HSK), Keratitis Sicca (KCS), Microbial Keratitis

Learn their causes, signs, and symptoms

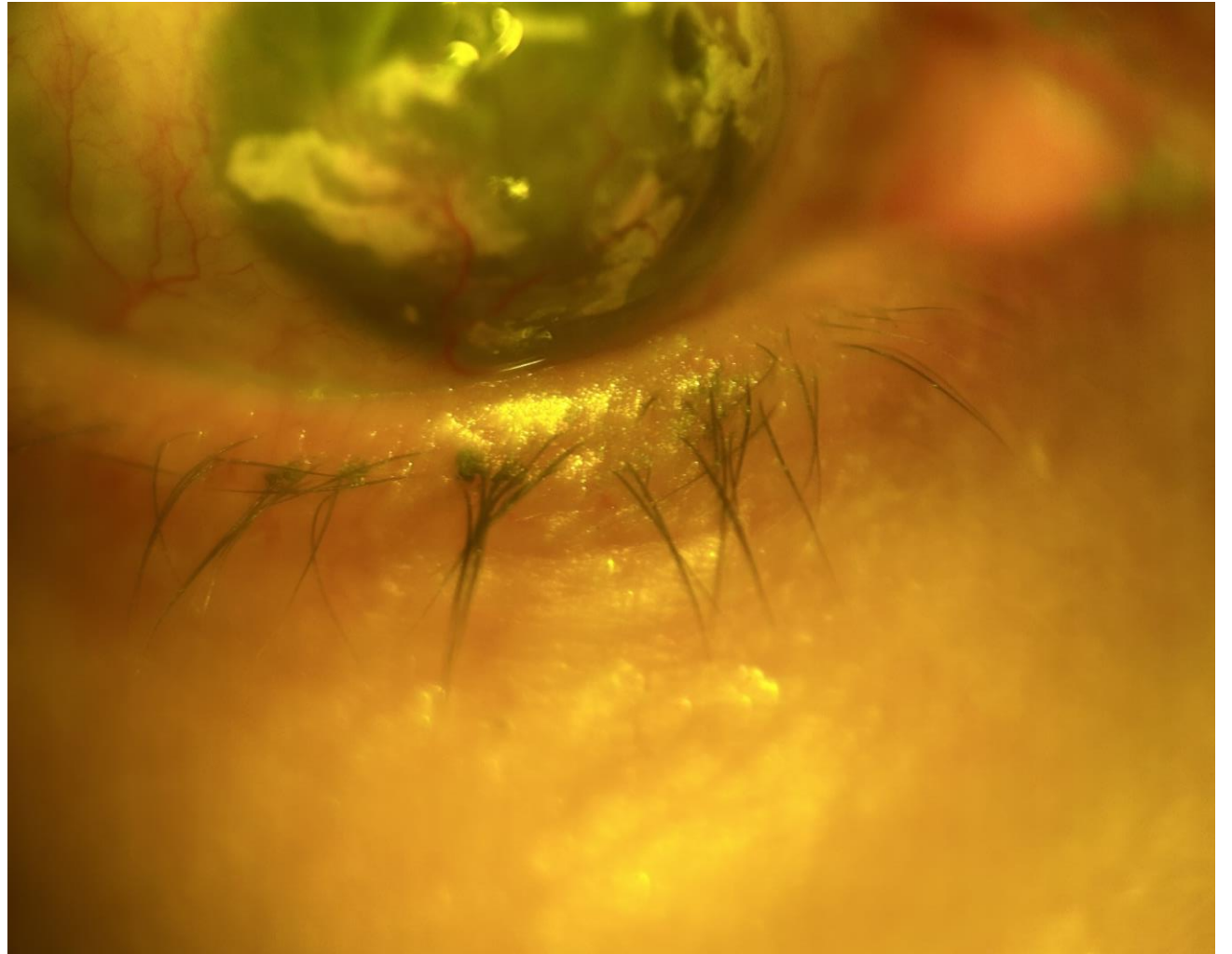
Deep dive into their differential diagnoses

Explore some newer treatment modalities

Keratitis



Failed Graft



Thygeson's Keratitis

Like Uveitis for the cornea

What the heck is TSPK anyway?

- Exact etiology remains unknown
- Auto-immune processes have been suspected
- Genetic association with HLA-DR3 – an antigen associated with several auto-immune disorders (like Sjogren's Syndrome)
- This antigen may alter the immune response in these patients which gives way to the prolonged disease course, and the fact that it waxes and wanes throughout years to decades



Who Gets TSPK?

- Slight female predilection
- Ages 3 - 70, mean age 29
- No racial bias



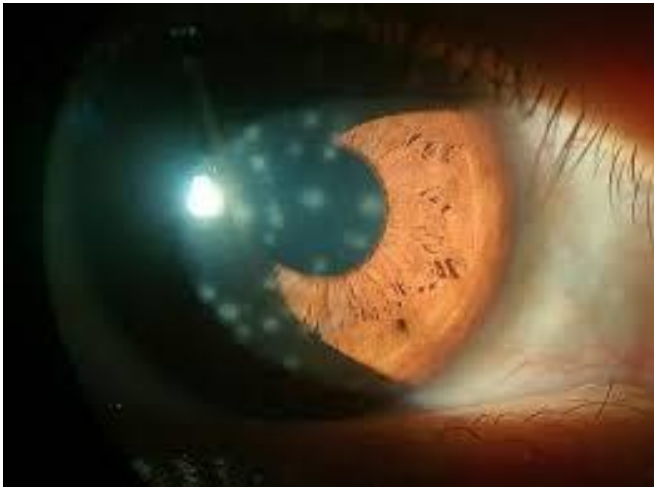
Signs

- Usually bilateral, but can be unilateral
- Multiple white-grey intra epithelial deposits,
- Lesions cause an elevation of the epithelium and classic negative staining with FL
- 1 – 50 lesions in the central cornea
- Typically 5 – 10 lesions

Conjunctiva is Clear

- Corneal sensation remains Normal – unlike in HSK
- Minimal to no conjunctival involvement
- Can be stellate or snowflake in appearance
- Vision is minimally affected
- Does not respond to antibiotic treatment





Symptoms

- Burning
- Irritation / foreign body sensation
- Tearing
- Photophobia

A pair of glasses is held in front of a vision chart. The chart features a large letter 'E' at the top and various patterns of lines and numbers below. The glasses are held by a hand, and the background is a blurred vision chart.

Vision

- Slightly decreased vision
- Minimally affected despite central lesions



Recurrence

- Frequent bouts of recurrence
- May reoccur despite medical treatment.
- Average recurrence ~11 years

The Differentials

Viral Conjunctivitis

Superficial Punctate Keratitis

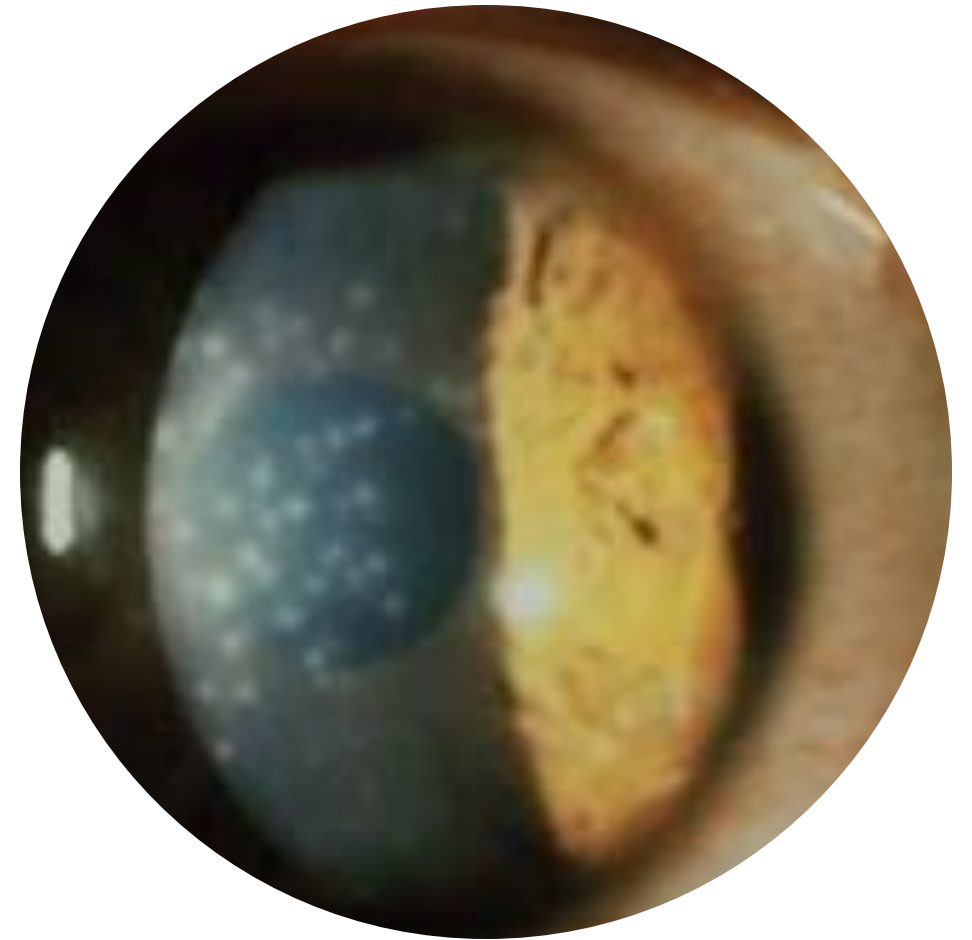
Recurrent Corneal Erosion

Staph marginal Keratitis

Herpes Simplex Keratitis

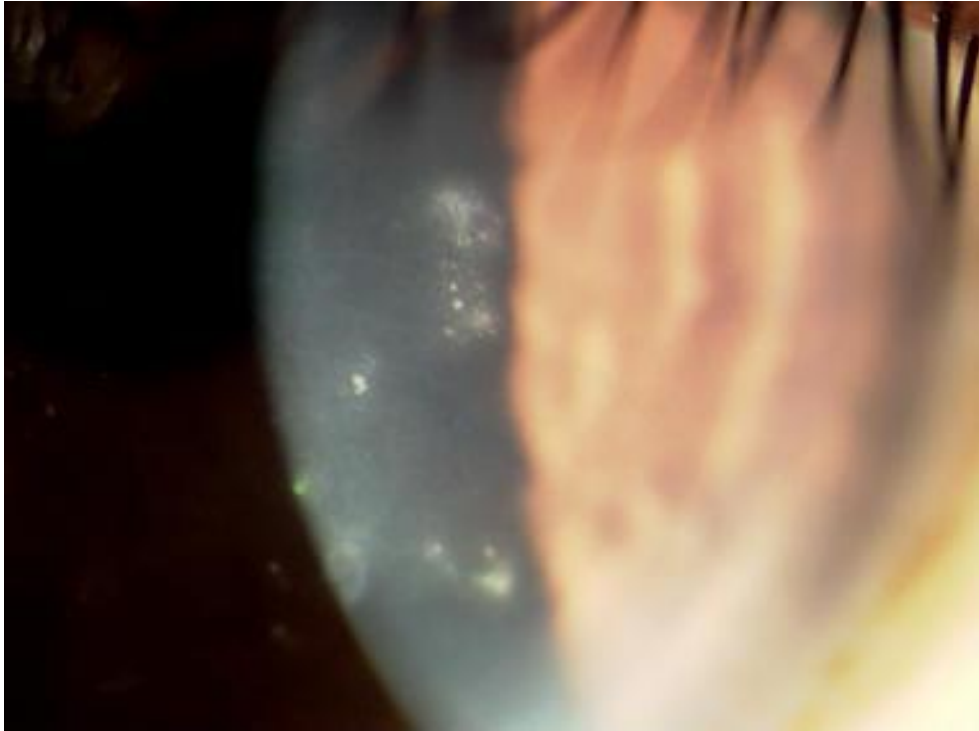
Epidemic Keratoconjunctivitis (EKC)

- Infectious keratitis
- Usually caused by Adeno virus
- Palpable PA Node
- Often has systemic flu like symptoms
- Spreads quickly from eye to eye (70% bilateral in 1 week)
- Spreads easily from person to person
- Redness, eyelid edema, tearing, irritation, foreign body sensation, and photophobia



TSPK vs. EKC

TSPK



EKC



Signs of TSPK vs. EKC

Similar

- Lesion appearance
- Bilateral lesions
- Photophobia
- FB sensation

Different about EKC

- Spreads from one eye to other
- Vision significantly affected
- Can take a long time to respond to steroid treatment
- Conjunctival involvement- SCH
- Systemic flu like symptoms
- Adeno-Plus positive

4-Step Procedure

Collect sample



Assemble test



Run test



Read results



In Office Testing

- Approximately 1 in 4 patients with acute conjunctivitis have confirmed adenoviral conjunctivitis
- Detects all known serotypes of adenoviral conjunctivitis.
- Early and accurate diagnosis of pink eye may prevent serious consequences including morbidity.
- Overlap exists in the clinical signs and symptoms of acute conjunctivitis
- Can be easily misdiagnosis by eye care professionals
- Help reduce antibiotic resistance

Superficial Punctate Keratitis

Epi defects, FB sensation, redness

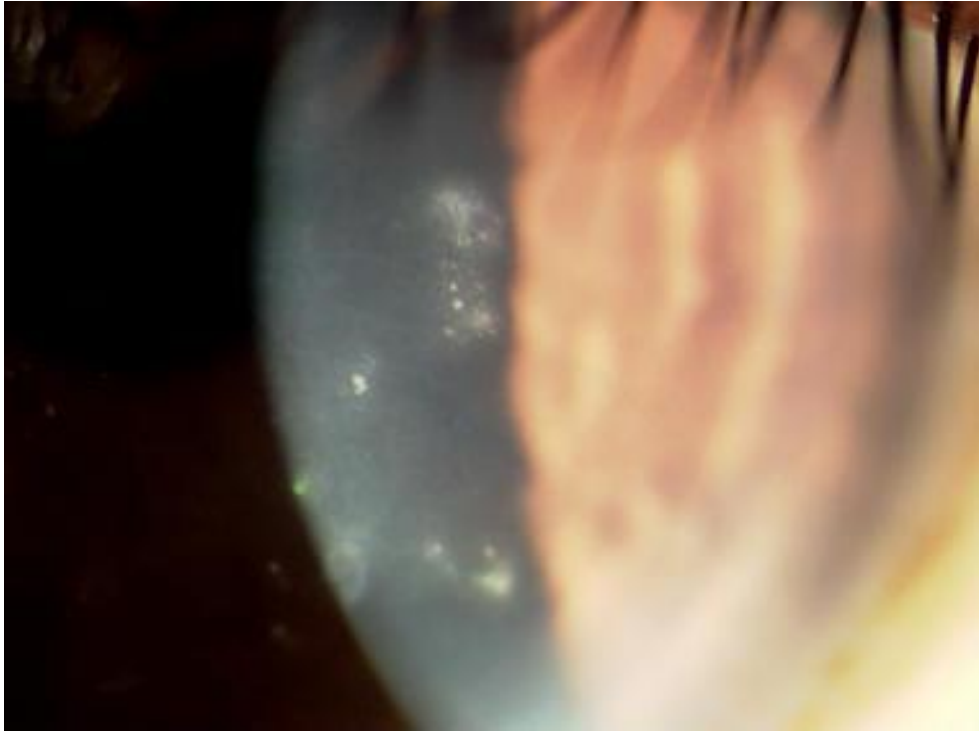
Photophobia, irritation and tearing

Causes:

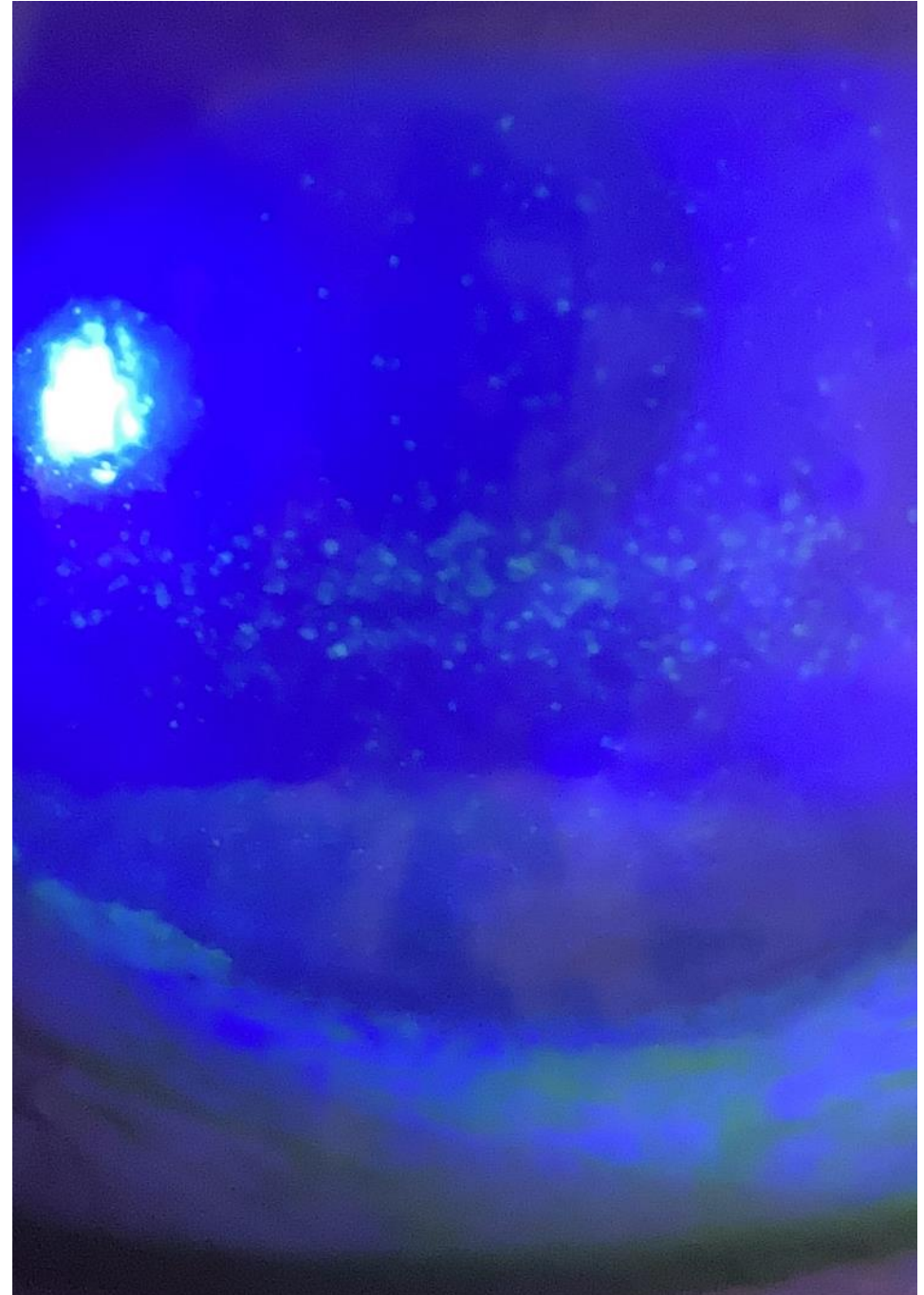
- Exposure
- Chemical
- KCS
- Medicamentosa
- Allergy
- Infection: viral or bacterial

TSPK vs. SPK

TSPK



SPK



Signs of TSPK vs. SPK

Similar

- Lesion appearance
- Bilateral lesions
- Photophobia
- FB sensation

Different about SPK

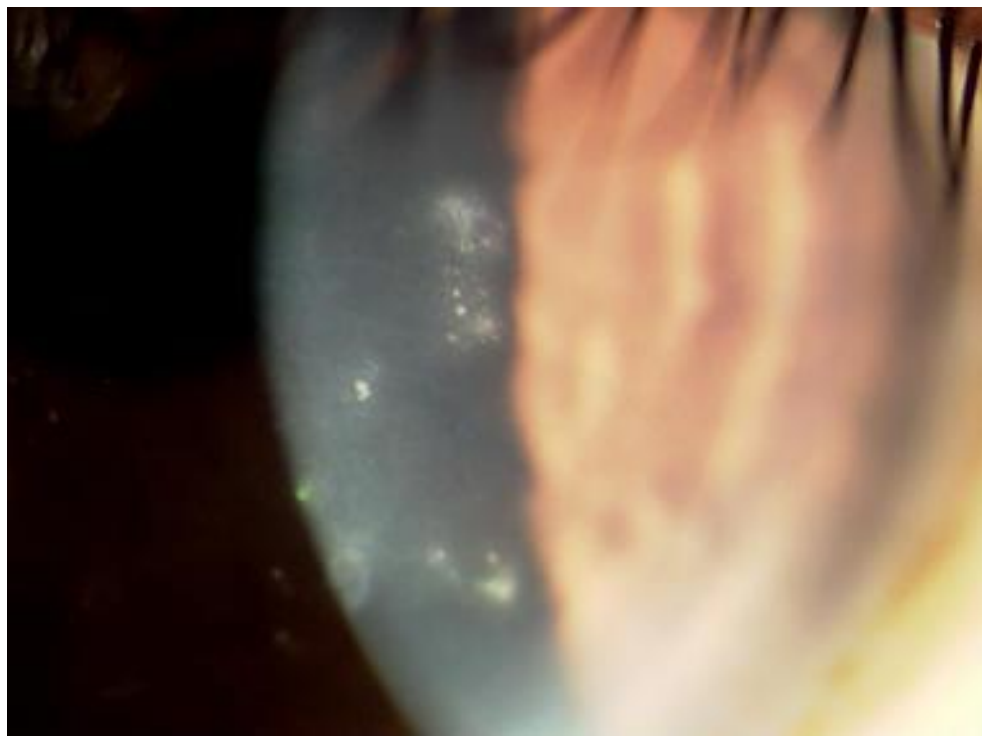
- Lesion is superficial TSPK is intra-epithelial
- Lesions can be more confluent
- Appear in bands
- Vision may be more affected
- Usually conj involvement

Recurrent Corneal Erosion

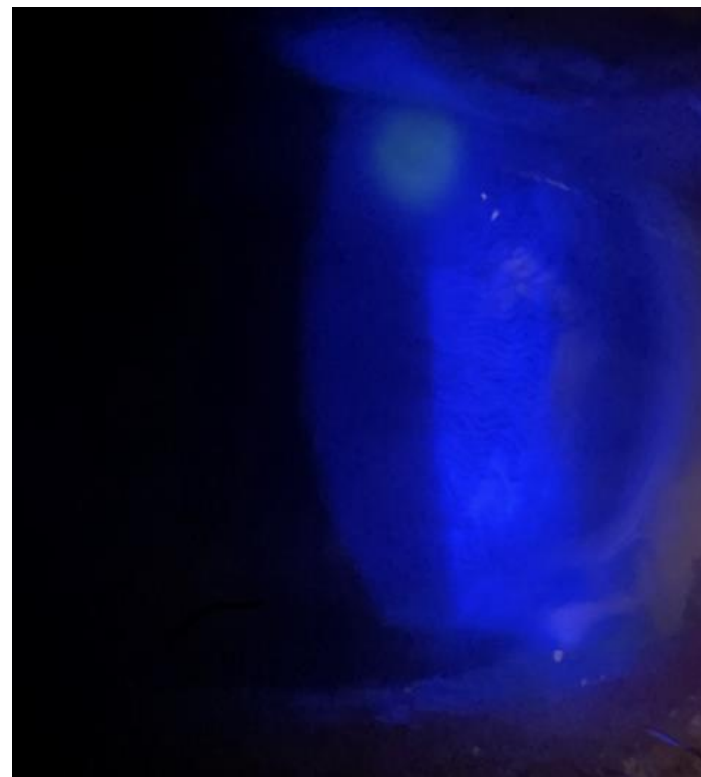
- Symptoms occur most often in the morning or middle of the night
- Usually only one lesion
- Significant sudden onset PAIN
- Sometimes resolve on their own
- May occur months after an initial abrasion

TSPK vs. RCE

TSPK



RCE



Signs of TSPK vs. RCE

Similar

- Lesion appearance
- Photophobia
- FB sensation

Different about RCE

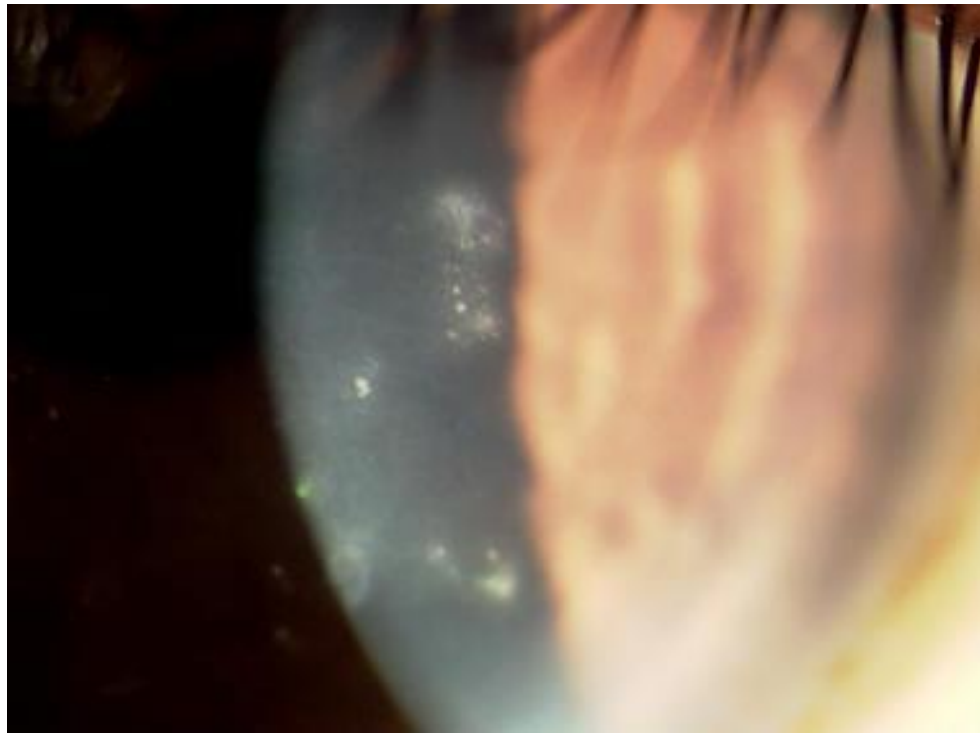
- Usually only one lesion at a time
- Vision may be more affected
- Initial onset is sudden

Staph Marginal Keratitis (SMK)

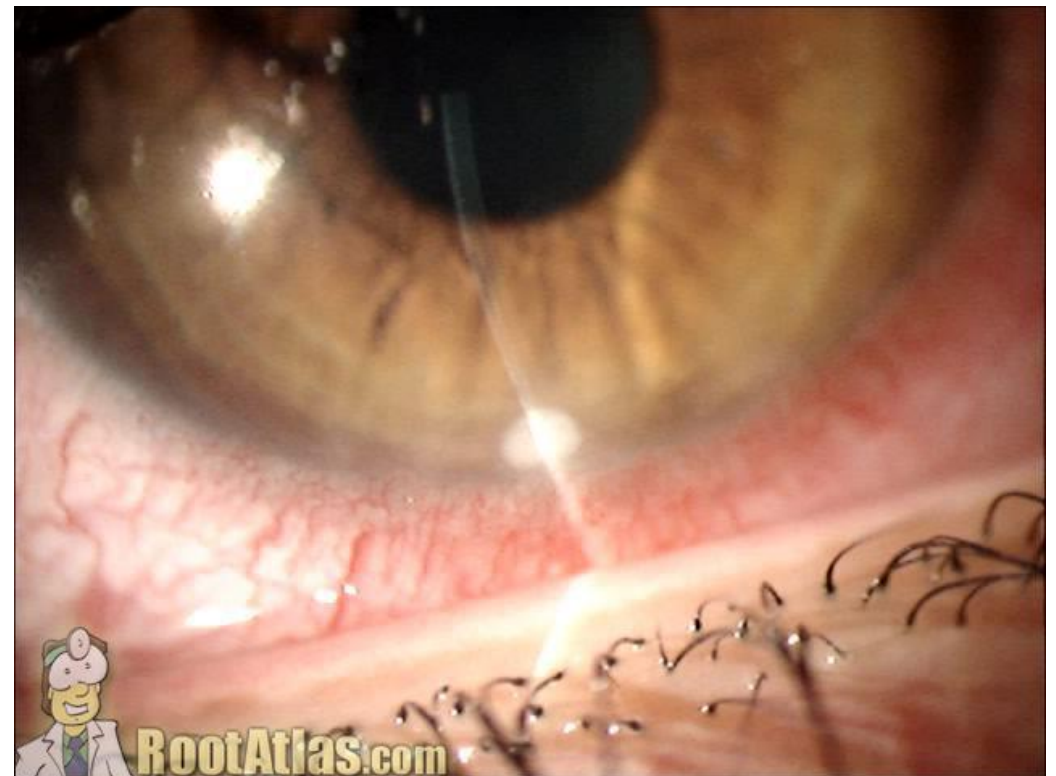
- Small round infiltrates at limbus
- Can be one or multiple
- Redness
- If untreated, lesions will coalesce into larger areas and stain
- Injection of bulbar conjunctiva adjacent to infiltrate
- Zone of clear cornea between limbus and lesion
- Red, watery, photophobia, FB sensation

TSPK vs. SMK

TSPK



SMK



Signs of TSPK vs. SMK

Similar

- Lesion appearance
- Photophobia
- FB sensation
- Vision not significantly affected

Different about SMK

- Lesions are peripheral
- Presents with blepharitis as well

Herpes Simplex Keratitis

- Check corneal sensitivity
- HSK will have decreased sensitivity
- Severe infection that can lead to scarring and blindness
- Worsens with steroid

What triggers HSK

Fever

Hormonal changes

Ultraviolet exposure

psychological stress

ocular surgery

Ocular trauma

Immunosuppression

Pregnancy



TSPK vs. HSK

TSPK vs. HSK

TSPK

- Stellate or snowflake lesion
- Little conjunctival injection
- Normal corneal sensation
- Does not respond to antibiotic or antiviral treatment
- High rate of recurrence
- Culture negative
- Usually no scarring

HSK

- Dendritic lesion
- Conjunctival redness
- Decreased corneal sensation
- Responds to antivirals
- 50% recur in five years and 63% at 20 years
- Can culture active lesion
- High probability of scarring

TSPK Management

Not necessary to culture

Can take slit lamp photos

Follow up Q1week until lesions
begin to resolve

Q2-3 weeks to monitor IOP,
depending on IOP elevation risk

TSPK Treatment

Artificial Tears to
reduce irritation

Topical
Corticosteroids

Therapeutic contact
lenses in cases of
severe FBS (with
prophylactic
antibiotic, but not
to treat lesions)

Topical Cyclosporin

Topical Treatment

- Topical Steroids
mainstay: QID until the deposits resolve, slow taper.
- Can use topical Cyclosporine when steroids are contraindicated
- Steroid responder
- Cataract formation
- Long term treatment safe with Cyclosporine

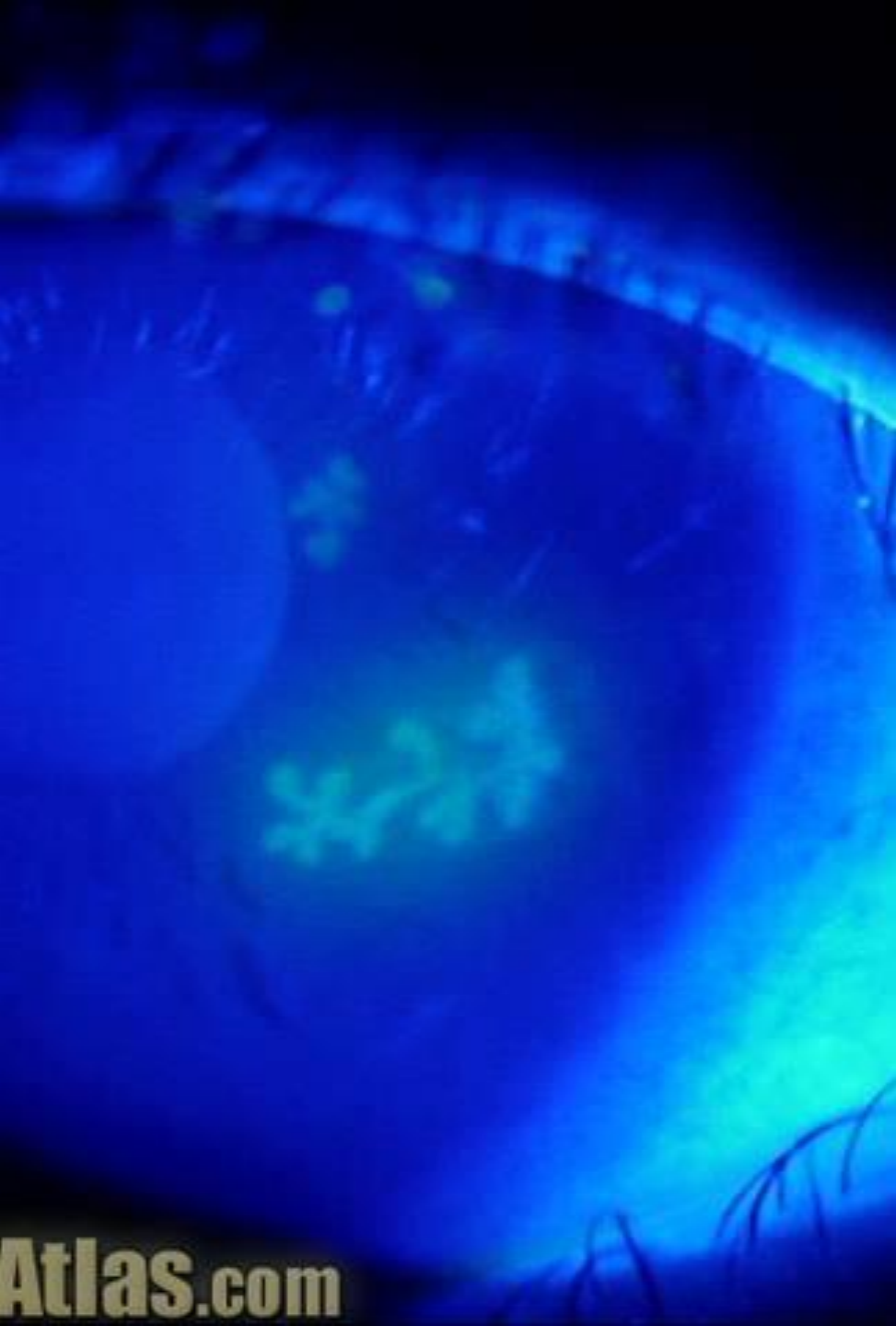
TSPK Surgical Intervention?



- PRK and epi ebridement have shown to be insufficient in alleviating the inflammation in these patients

Case Report JG

- 45 yo Caucasian Male
- Referred in from local optometrist
- Pain, light sensitivity OD X 3 weeks
- VA = 20/30
- Current Medications: Moxifloxacin TID



Most Important Differential

- Rule Out Herpes Simplex Keratitis
- History of fever blister
- Previous HSK infection
- Lesions on lids

Treatment Plan 1

- Oral Anti-viral
- Review of Dosages:
- Acyclovir – 400mg 5x/day
- Valacyclovir – 500mg TID
- Famciclovir – 250mg TID
- 7 - 10 days

Treatment Plan 2

- Pt did not respond to oral Acyclovir
- HSK Ruled Out!
- Now okay to add steroid
- Pred Forte QID until the deposits resolve
- Slow taper
- Can Rx QD or QOD steroid long term to reduce recurrences



Filamentary Keratitis

New Treatments



Filamentary Keratitis

Key Findings

- Strands or filaments attached to the cornea
- Increased mucus to aqueous ratio in the tear film
- Schirmer's test shows low aqueous production
- Patient notes foreign body sensation

Tests for Filamentary Keratitis

- Slit lamp exam
- Vital dyes (lissamine, fluorescein, rose bengal)

Treatment Options



Topical lubricants (tears/ung)

N-Acetylcystiene drops

Bandage Contact lenses

Biologic Membranes

- Dehydrated AMT
- Cryopreserved AMT

Cr

Intense Pulsed Light

Biologic Drops

- Serum Tears
- PRP

Cytokine Drops

- Steroids
 - Loteprednol
 - Fluoromethalone
- Immunomodulators
 - Cyclosporine
 - Lifitegrast
- Scleral Contact Lenses



Cryopreserved Amniotic Membrane

- Approved by the FDA for:
 - Protective
 - wound healing
 - anti-inflammatory effects.
- Why is it so powerful:
- extracellular matrix components
 - heavy-chain hyaluronic acids
 - growth factors
 - Fibronectin
 - Collagen
- promote anti-inflammatory effects and healing



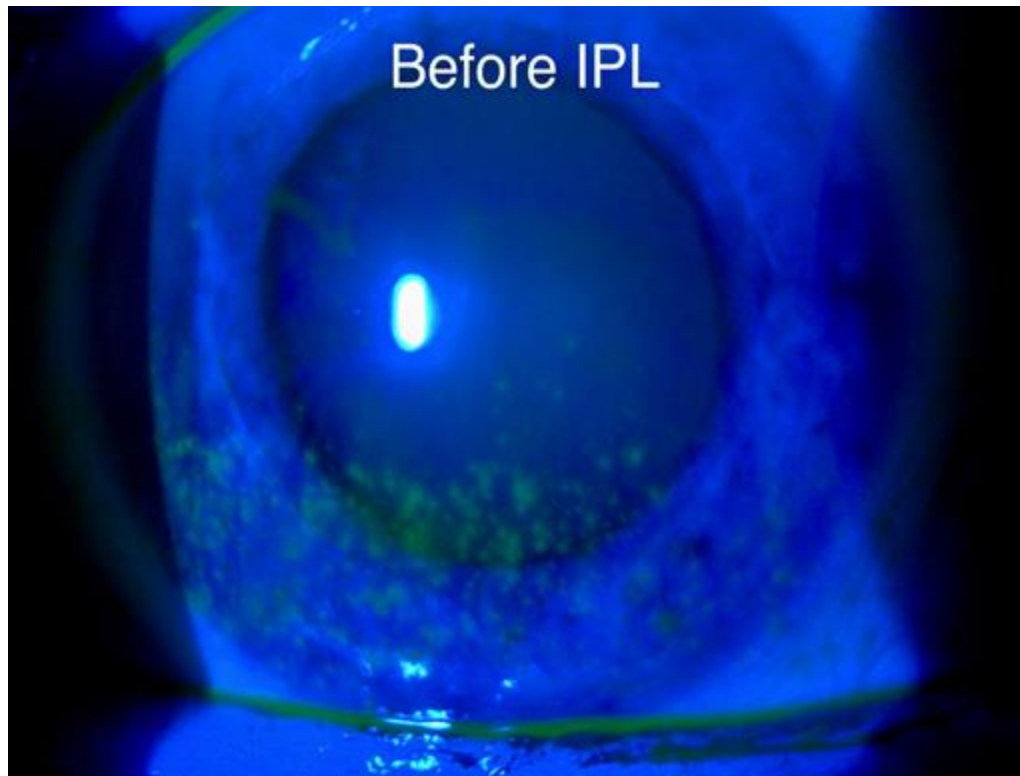


Dehydrated Amniotic Membrane

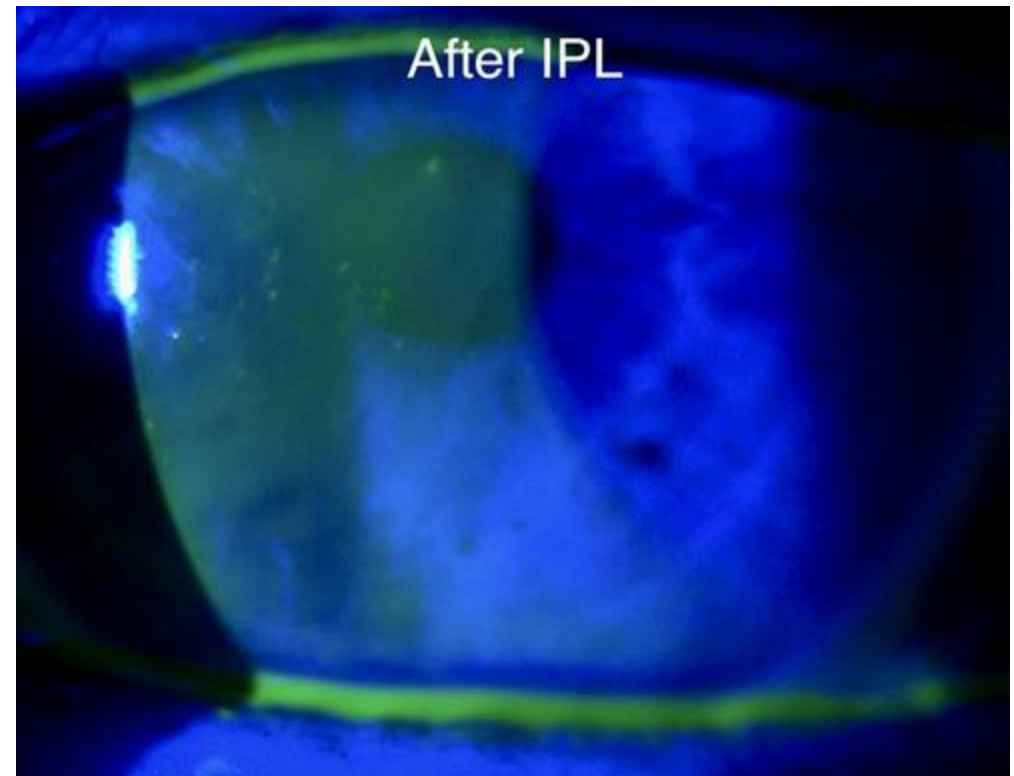
- Room temperature stable allograft derived from human placental tissue collected from consenting donors
- Extra cellular matrix acts as a reservoir of bioactive peptides:
 - Growth factors
 - Cytokines
 - Glycosaminoglycans
- Basement membrane interface acts as a substrate that supports:
 - cellular adhesion
 - transplanar migration
 - proliferation.

IPL for Sjogren's Syndrome, Filamentary Keratitis

Before IPL



After IPL (Photos courtesy of L. Hornick)





Neurotrophic Keratitis

It's not rare when it's in your chair.

Neurotropic Keratitis Definition

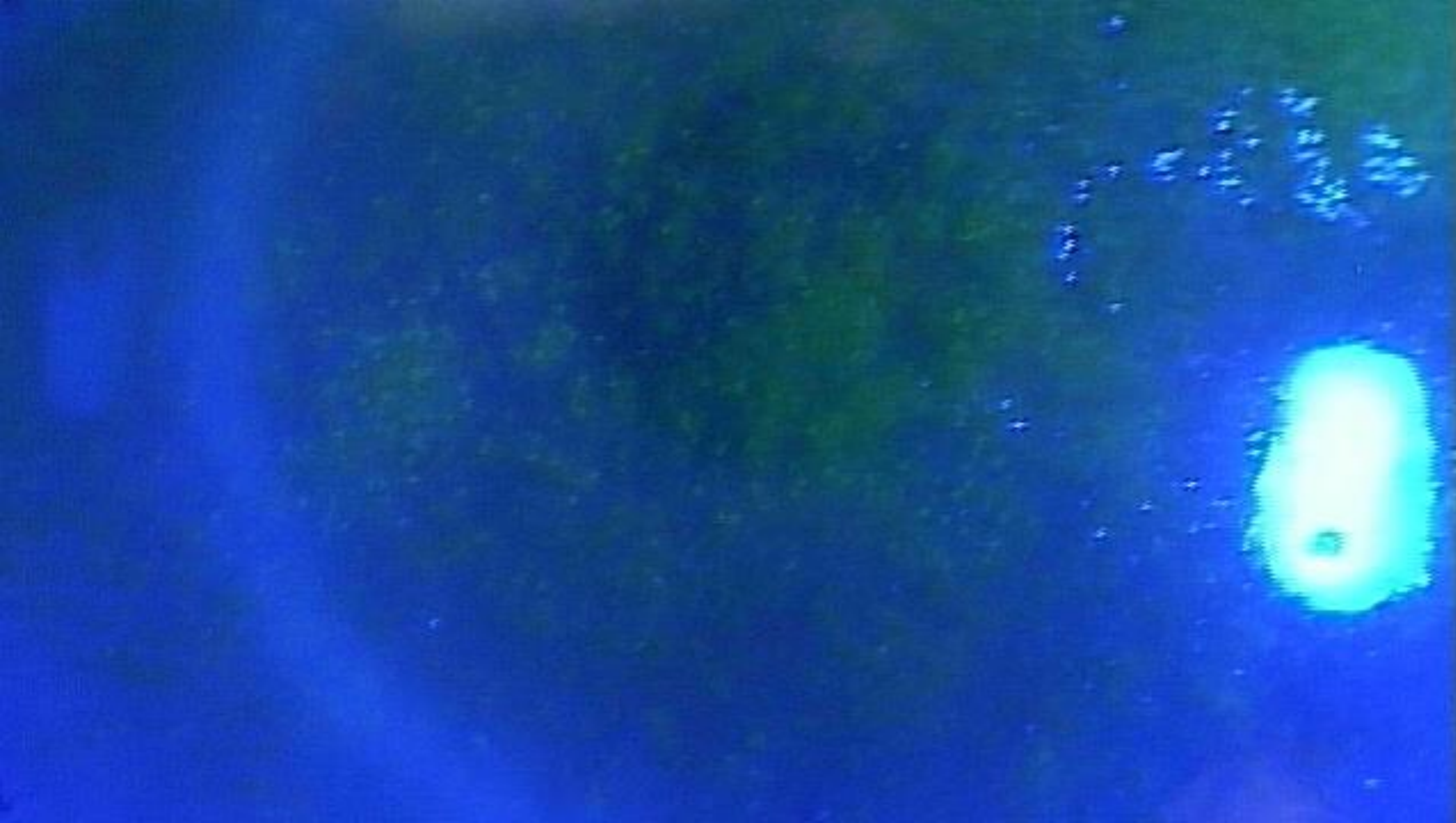


Degenerative corneal disease
Damage to the trigeminal nerve
(cranial nerve V)
Loss of corneal sensation
Breakdown of the corneal
epithelium
Impaired corneal healing
Persistent epithelial defect →
corneal ulceration → stromal
melting and perforation

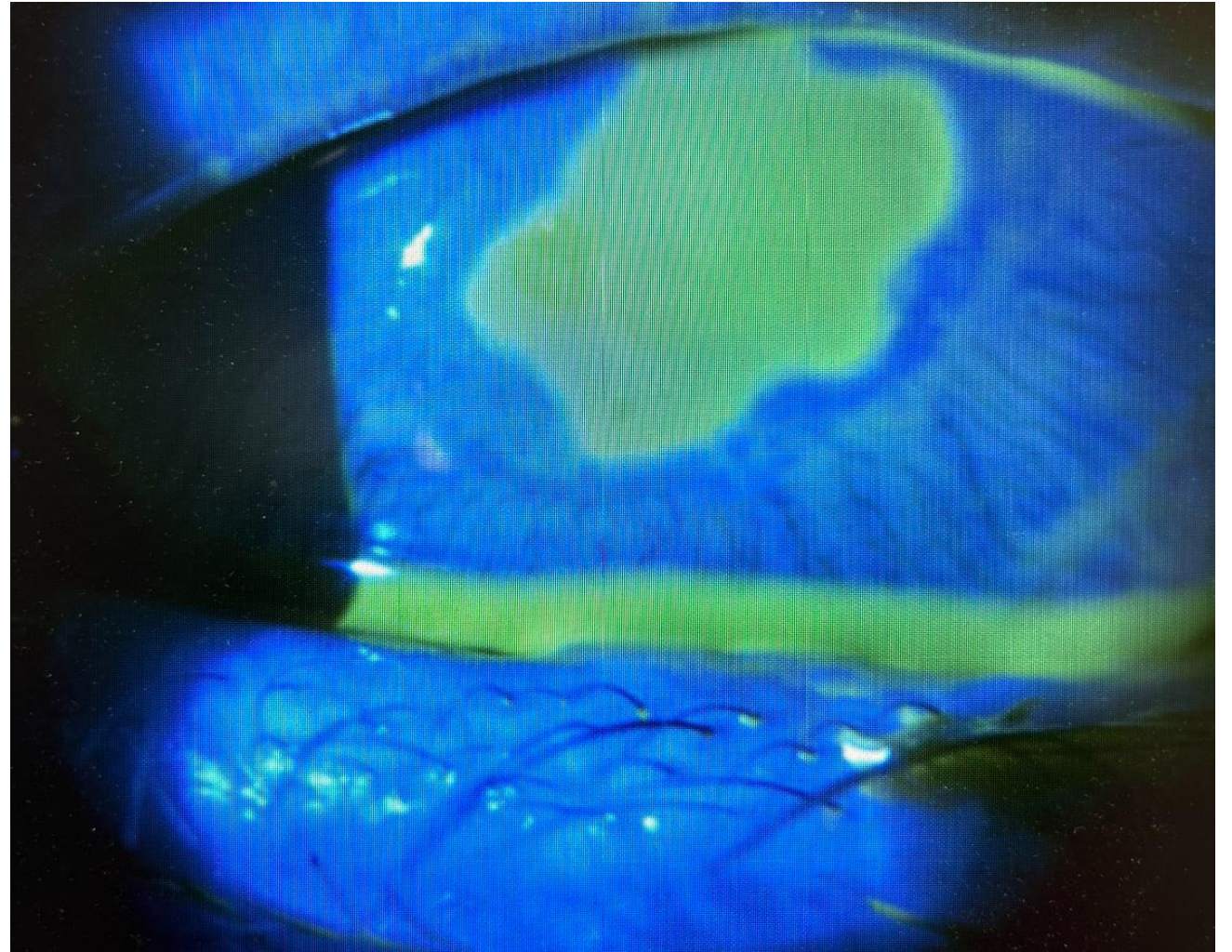
Hallmark: decreased sensation, decreased or no pain

Severity-Based Therapy

Stage	Therapy
1	<ul style="list-style-type: none">• Preservative-free artificial tears formulations• Punctal occlusion• Hydrogel contact lens (consider large diameter)• Recombinant human NGF (rhNGF, cenegermin)• Serum/plasma/platelet rich plasma tears
2	Supportive therapies plus: <ul style="list-style-type: none">• rhNGF• Scleral lens ($\pm$ serum/plasma/PRP tears)• Amniotic membrane• Botulinum induced ptosis, Tarsorrhaphy
3	<ul style="list-style-type: none">• rhNGF• Keratoplasty + scleral lens, tarsorrhaphy, neurotization

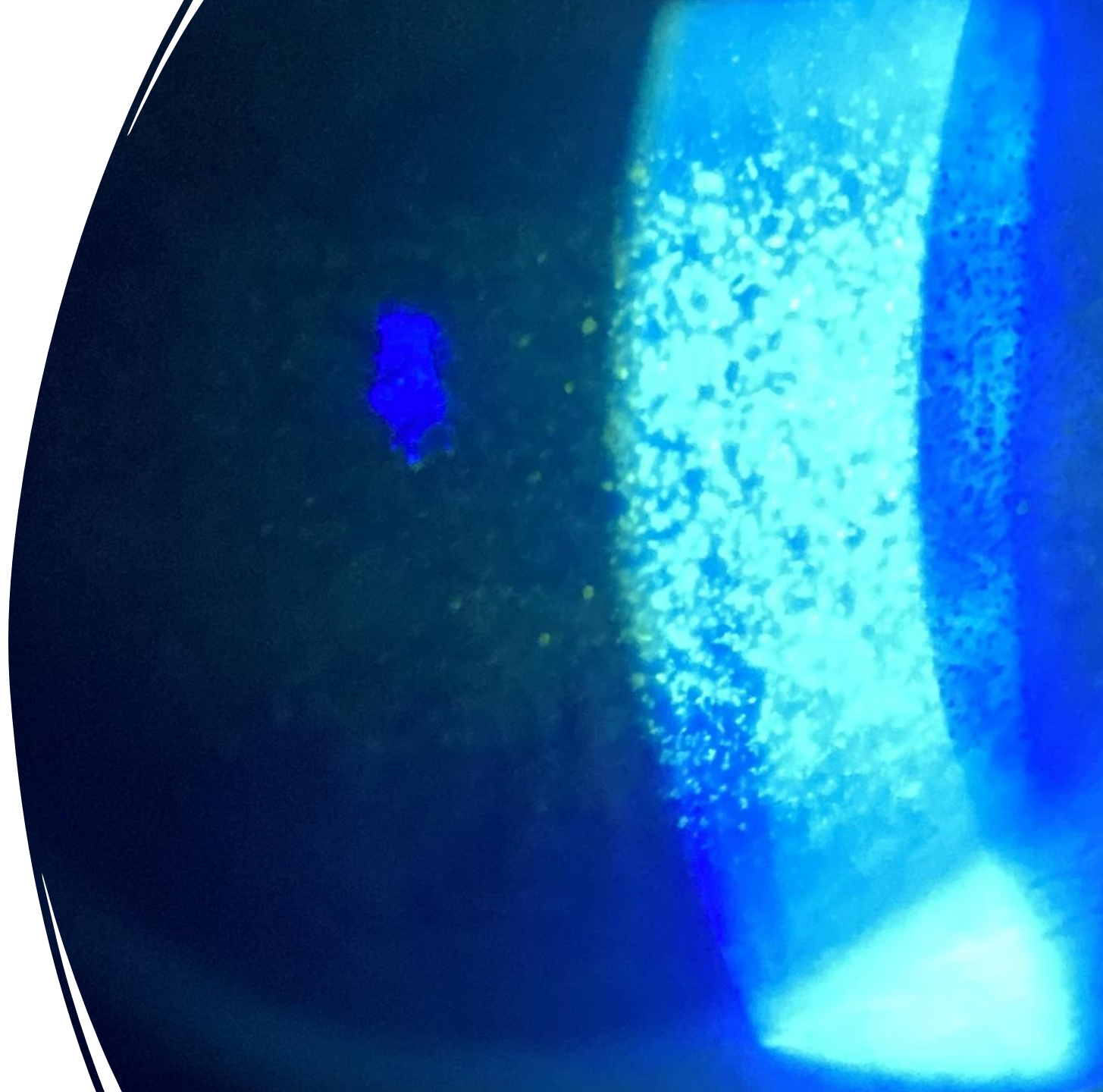


Central K Ulcer - Bacterial



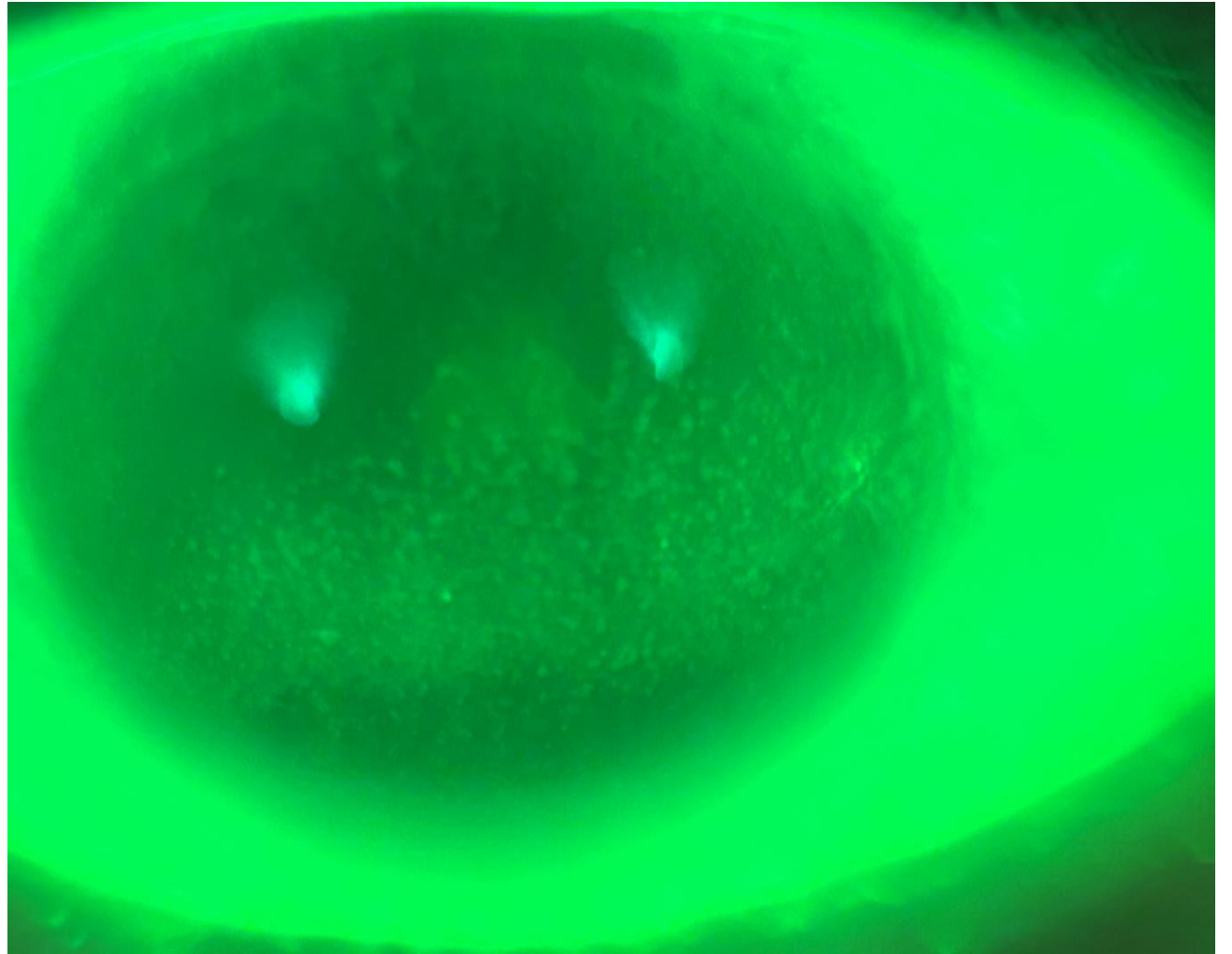
Dense NK

- Pre-treatment photo



NK

4 weeks of cenergemim treatment



NK

Diabetic

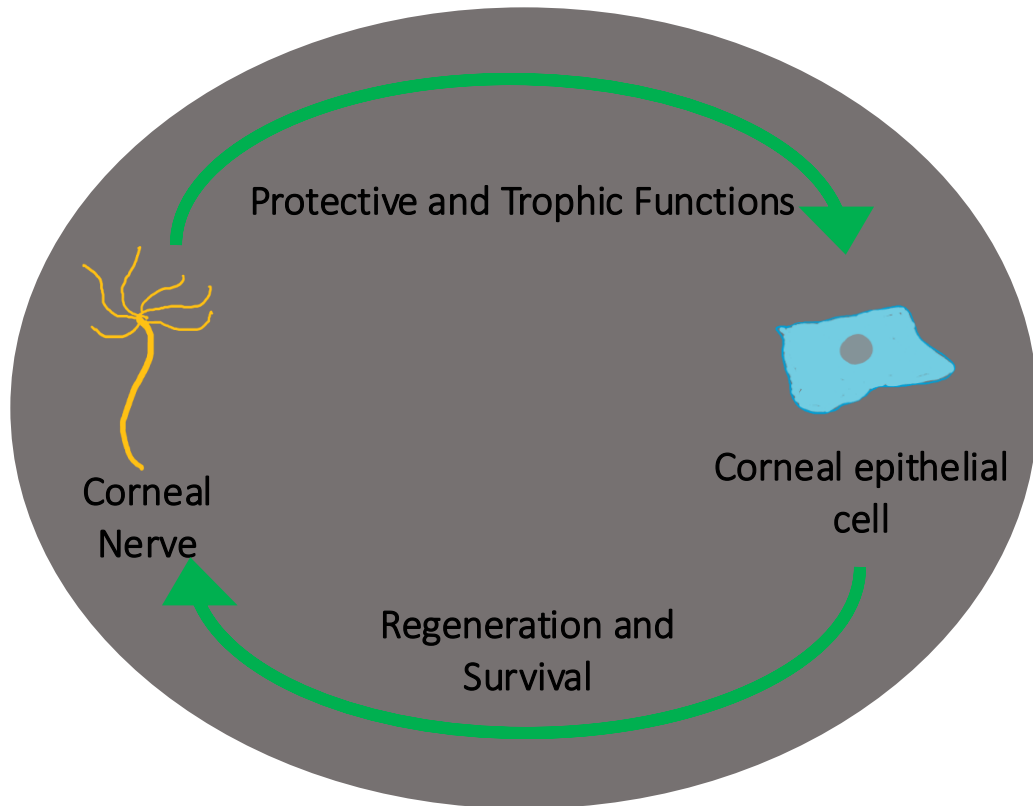
s/p tarsorrhaphy

s/p 1 round of cenergemim

Waiting for second round of cenergemim



Corneal Innervation



The cornea is the most sensitive and densely innervated tissue in the human body^{1,2}

Corneal innervation is essential. Corneal epithelial cells act in a mutually supportive relationship with corneal nerves¹⁻⁴

- Corneal nerves: maintain corneal integrity
- Protective functions: blinking and tearing
- Trophic support: neuropeptides (eg, substance P) promote epithelial cell proliferation, migration, adhesion
- Epithelial cells: neurotrophic factors (neuronal extension and survival)

Corneal nerve damage = loss of corneal sensation, epithelial breakdown, poor healing^{1,2}

1. Sheha H. Clinical Ophthalmology. 2019;13 1973-1980.
2. Versura P, et al. Eye and Brain. 2018;10 37-45.
3. Dua HS, et al. Prog Retinal Eye Res. 2018;66:107-131.
4. Saad S, et al. Ocular Surf. doi:10.1016/j.jtos.2019.11.008.

Etiology



INFECTIOUS^{1,2}

- Herpes (simplex, zoster)
- Leprosy

IATROGENIC^{1,2}

- Trauma to ciliary nerves by laser treatment and surgery
- Corneal incisions
- LASIK

SYSTEMIC DISEASE^{1,2}

- Diabetes
- Multiple sclerosis
- Vitamin A deficiency

CORNEAL DYSTROPHIES^{1,2}

- Lattice
- Granular

TOXIC^{1,2}

- Chemical burns
- Carbon disulfide exposure
- Hydrogen sulfide exposure

TOPICAL MEDICATIONS^{1,2}

- Anesthetics (abuse)
- Timolol
- Betaxolol
- Sulfacetamide
- Diclofenac sodium
- Ketorolac

MISC²

- CTL
- Increasing age
- Dark eye color
- Adie syndrome
- Limbal stem cell failure (chronic)

FIFTH-NERVE PALS^{1,2}

- Trigeminal neuralgia surgery
- Neoplasia (acoustic neuroma)
- Aneurysms
- Facial trauma
- Congenital
- Riley-Day syndrome
- Goldenhar-Gorlin syndrome
- Möbius syndrome
- Familial corneal hypesthesia

1. Dua, HS, et al. Prog Retinal Eye Res. 2018;66:107-131.

2. Medscape. Neurotrophic keratitis. <https://emedicine.medscape.com/article/1194889-overview>

Endogenous nerve growth factor (NGF) and its role in NK:

Neurotrophic keratitis (NK) is a result from impaired trigeminal corneal innervation

- ↓ Lacrimation and blink reflex
- ↓ Epithelial cell vitality, metabolism, mitosis
- ↓ Epithelial trophism and repair
- ↑ Stromal and intracellular edema
- ↓ Microvilli
- ↓ Development of the basal lamina

Endogenous NGF Maintains Corneal Integrity By Three Mechanisms

Endogenous nerve growth factor acts through specific high-affinity (ie, TrkA) and low-affinity (ie, p75NTR) nerve growth factor receptors in the anterior segment of the eye to support corneal innervation and integrity.¹

SHOWN IN PRECLINICAL MODELS¹

CORNEAL INNERVATION

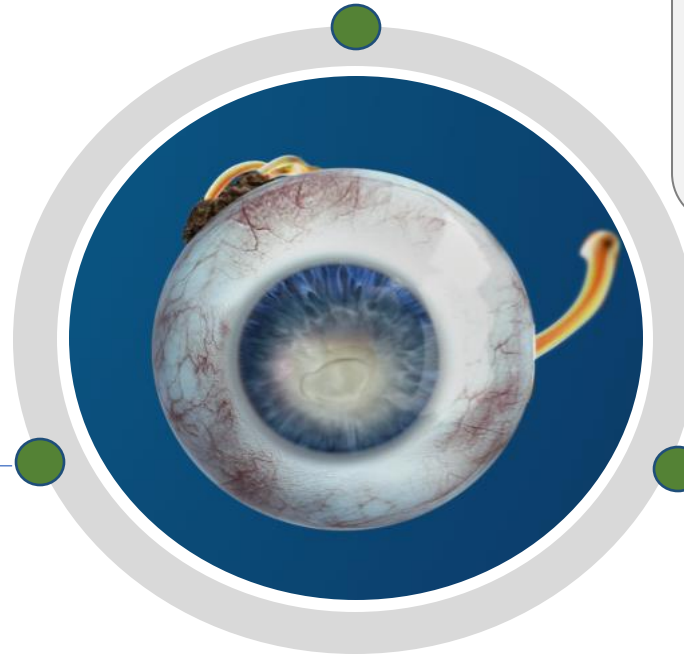
NGF plays a role in nerve function and stimulates the regeneration and survival of the sensory nerves^{2,3}

NGF binds receptors on lacrimal glands and promotes sensory-mediated reflex tearing secretion^{1,4}

TEAR SECRETION

CELL PROLIFERATION AND DIFFERENTIATION

NGF stimulates proliferation, differentiation, and survival of corneal epithelial cells¹



1. Mastropasqua L, Massaro-Giordano G, Nubile M, Sacchetti M. Understanding the pathogenesis of neurotrophic keratitis: the role of corneal nerves. *J Cell Physiol.* 2017 Apr;232(4):717-724. 2. Müller LJ, Marfurt CF, Kruse F, Tervo TM. Corneal nerves: structure, contents and function. *Exp Eye Res.* 2003 May;76(5):521-42. 3. Sacchetti M, Lambiase A. Diagnosis and management of neurotrophic keratitis. *Clin Ophthalmol.* 2014;8:571-9. 4. Muzi S, Colafrancesco V, Sornelli F, et al. Nerve Growth Factor in the Developing and Adult Lacrimal Glands of Rat With and Without Inherited Retinitis Pigmentosa. *Cornea.* 2010;29:1163-1168.

Treatment

- Continue:
 - Cyclosporine 0.05% BID OU
 - Heat Mask
- Stop
 - Oral ceterizine - antihistamine
- Order
 - Cenegermin 20 mcg/mL – Patient to call once meds come in to review meds / demo proper usage
 - Ceterizine ophth sol BID OU
- Follow Up
 - 3-4 months glaucoma / Dilate OCT - G

Staph Marginal Keratitis

Is it an ulcer or not... That is the question.

Signs of SMK

- Small round infiltrates at limbus
- Can be one or multiple
- Redness
- If untreated, lesions will coalesce into larger areas and stain
- Injection of bulbar conjunctiva adjacent to infiltrate
- Zone of clear cornea between limbus and lesion

Symptoms of SMK



-
- Pain, Irritation
 - Photophobia
 - Watering
 - Foreign Body Sensation
 - Blurred vision

Causes and Co-Conspirators

- Overgrowth of Staph aureus bacteria
- Co-Conspirators:
- Contact Lenses
- Poor makeup hygiene
- Ocular rosacea
- Blepharitis – almost 100%
- Meibomitis





Differentials

- Vernal keratoconjunctivitis
- HSV keratitis
- Bacterial keratitis and ulceration
- Old corneal scars
- Exposure keratopathy
- Contact lens induced peripheral ulcer

SMK vs. VKC

SMK

- Peripheral lesions
- Little conjunctival injection
- Does not respond to antibiotic or antiviral treatment
- High rate of recurrence
- No itching
- Little watery discharge

VKC

- Shield Ulcer
- Conjunctival redness
- Responds to antihistamine & steroid
- High rate of recurrence
- Itching is hallmark
- Thickened discharge

SMK vs. Exposure Keratopathy

SMK

- Lesions scattered on cornea
- Lesions do not stain
- Mild conjunctival injection
- High rate of recurrence
- Symptoms same all day

Exposure

- Lesions grouped in band
- Band of staining
- May have sig conj Injection
- Recurs until exposure eliminated
- Usually worse in am

Differentiating an Infiltrate from an Ulcer

SMK - Sterile Infiltrate

- Small lesion <1mm
- Peripheral location – at limbus
- No mucus discharge
- No A/C reaction
- Foreign body sensation
- Mild photophobia
- Mild to no epi defect

Infectious Ulcer

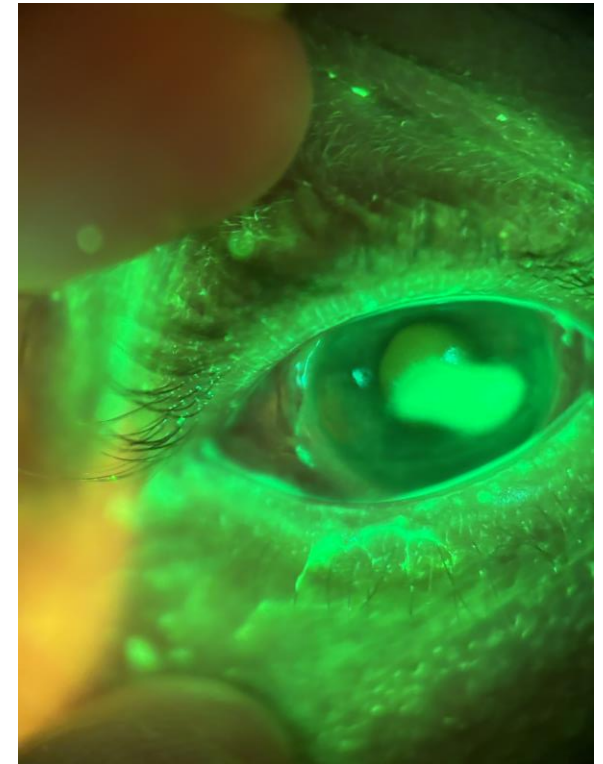
- Large Lesion >1mm
- Central >2mm of limbus
- Mucus discharge
- + A/C reaction
- Significant pain
- Significant photophobia
- Large epi defect

Differentiating SMK vs CL related Ulcer

- Sterile
- Localized Conjunctival injection
- Always at limbus
- Not necessarily a CL wearer
- Blepharitis

- Infectious
- Overall conjunctival injection
- Can be further into cornea
- Always related to CL wear
- Giant Papillary Conjunctivitis

Contact Lens related Keratitis



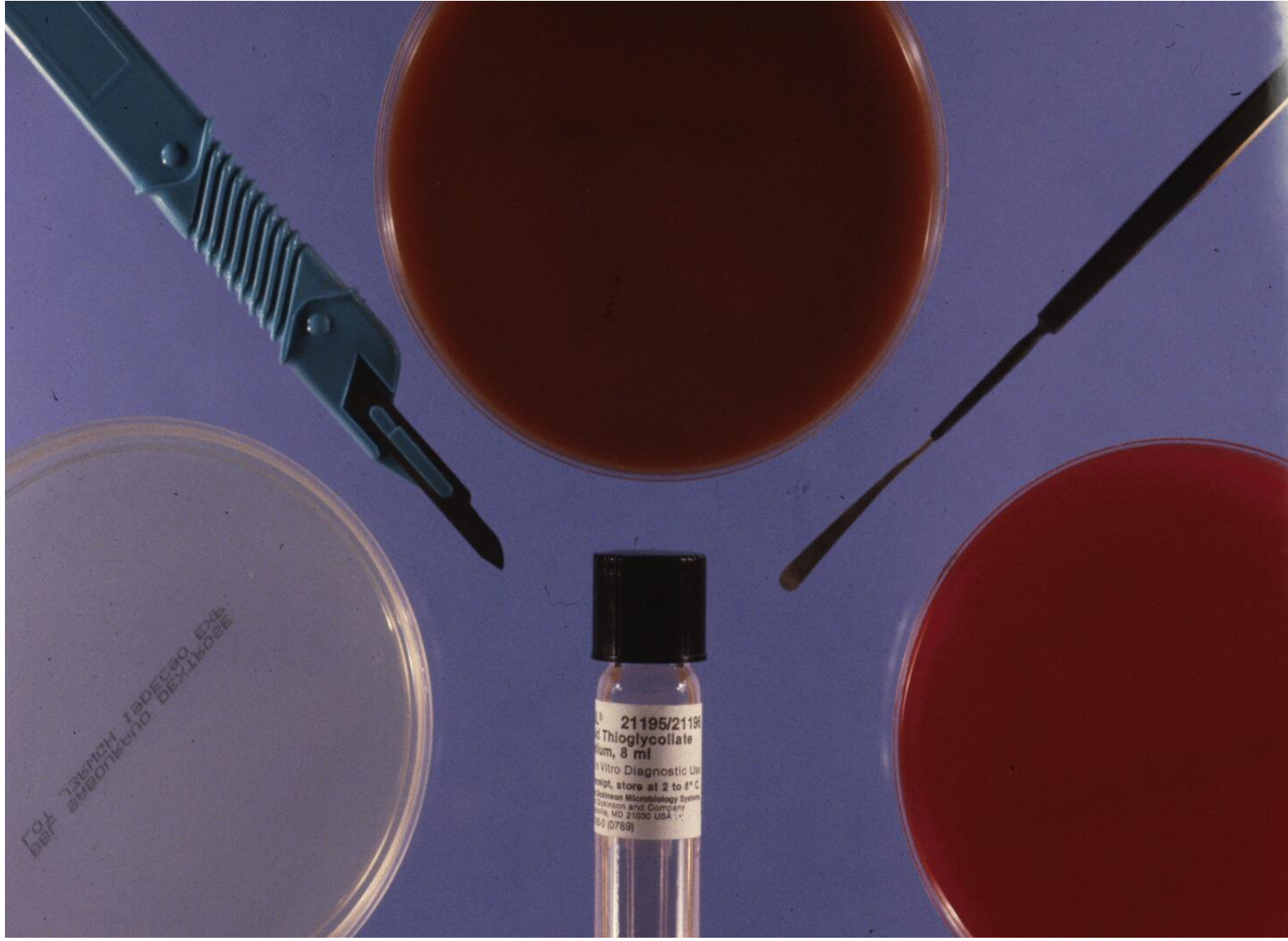


Clinical factors associated with positive corneal culture in suspected microbial keratitis

Matthew Green ^a, Susan Zhang ^b  , Thomas Nadivulath ^c, Andrew Apel ^d, Fiona Stapleton ^c

Conclusions

In this series positive cultures were associated with poor presenting VA contact lens keratitis (CLK), older age, anterior chamber reaction and no prior treatment with antibiotics.



Corneal Scrapings

Be certain to remove excess mucous to avoid false negatives (necrotic tissue and PMNs)

Kimura spatula: culture the edge and base of the ulcer, serves to debride the lesion

Gram stain: only 12-60% accurate at pred Useful to use **two solid media** (blood and chocolate). Helps to R/O contaminants and aids in ID if there's sparse growth If only one is used chocolate is preferred. Plate Sabouraud's last!

- ☐ Add Lowenstein/Jensen, amoeba culture or HSV swab if necessary.
- ☐ Hold fungal cultures **longer** to assure there is no growth.
- ☐ If you use non-solid medias such as thioglycolate broth use a cotton-tip applicator that's **plastic, not wood** broken into the tube infecting organism

Giemsa stain: provides better morphologic characteristics of organisms and helps to distinguish bacteria from fungi

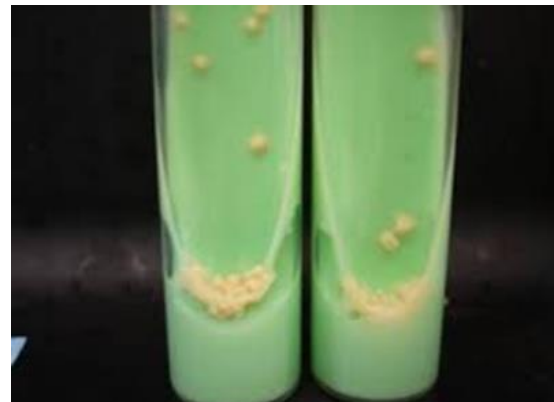
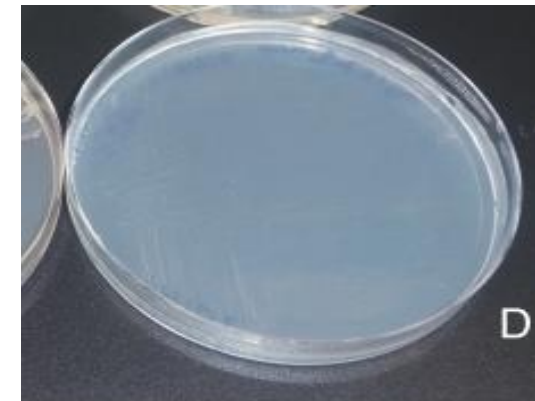
Culture Media

STANDARD MEDIA

- ❑ **Blood:** aerobic organisms, saprophytic fungi
- ❑ **Chocolate:** Neisseria, Moraxella, Haemophilus

SPECIALTY MEDIA

- ❑ **Sabouraud:** fungi (or Inhibitory Mold Agar)
- ❑ **Thioglycolate broth:** aerobic and anaerobic bacteria
- ❑ **Lowenstein–Jensen/slant test or Middlebrook 7H-9:** Nocardia, Mycobacteria species



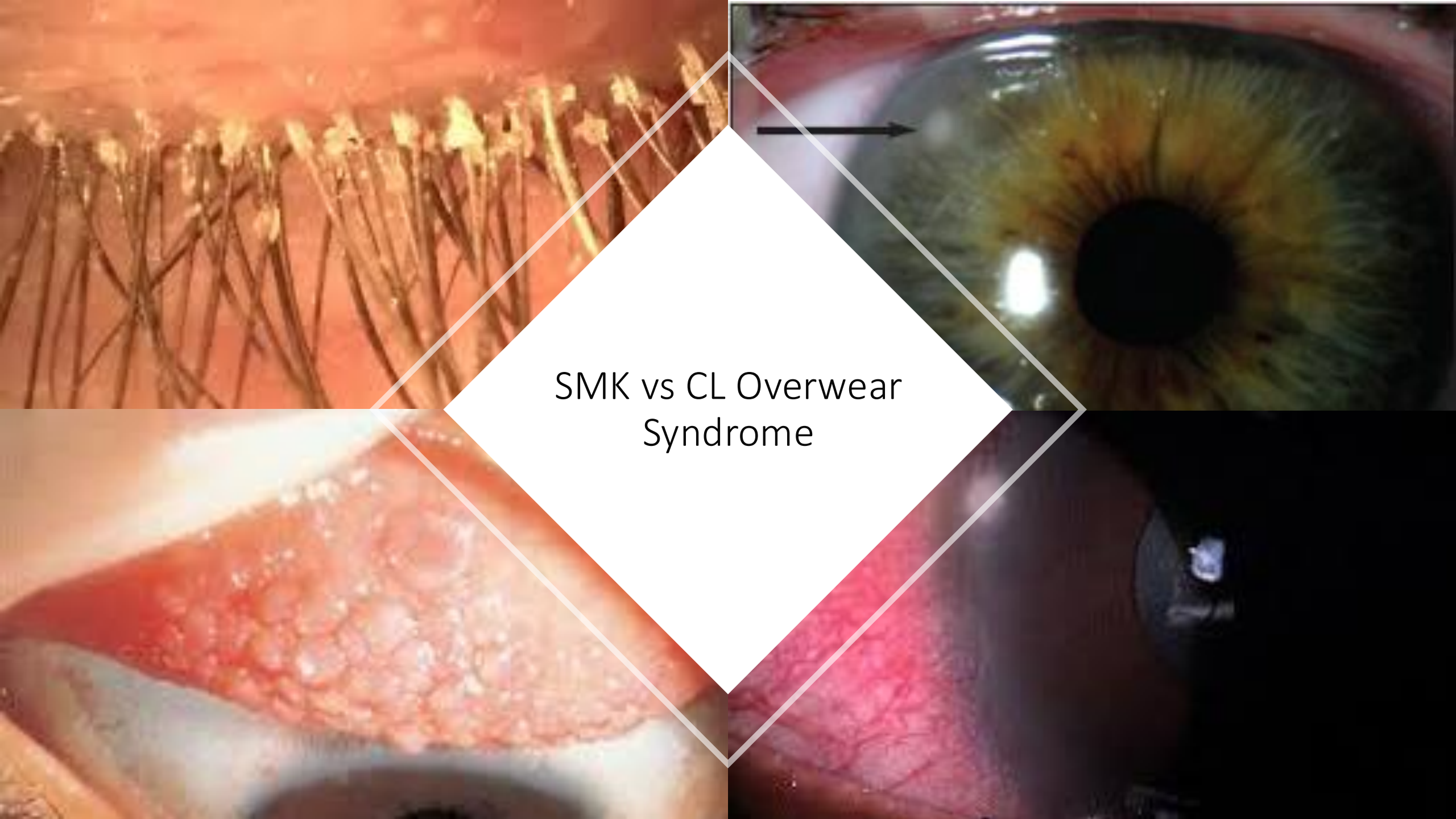
Two Treatment Arms for SMK

Resolve Corneal Infiltrate



Decrease Bacterial Overgrowth

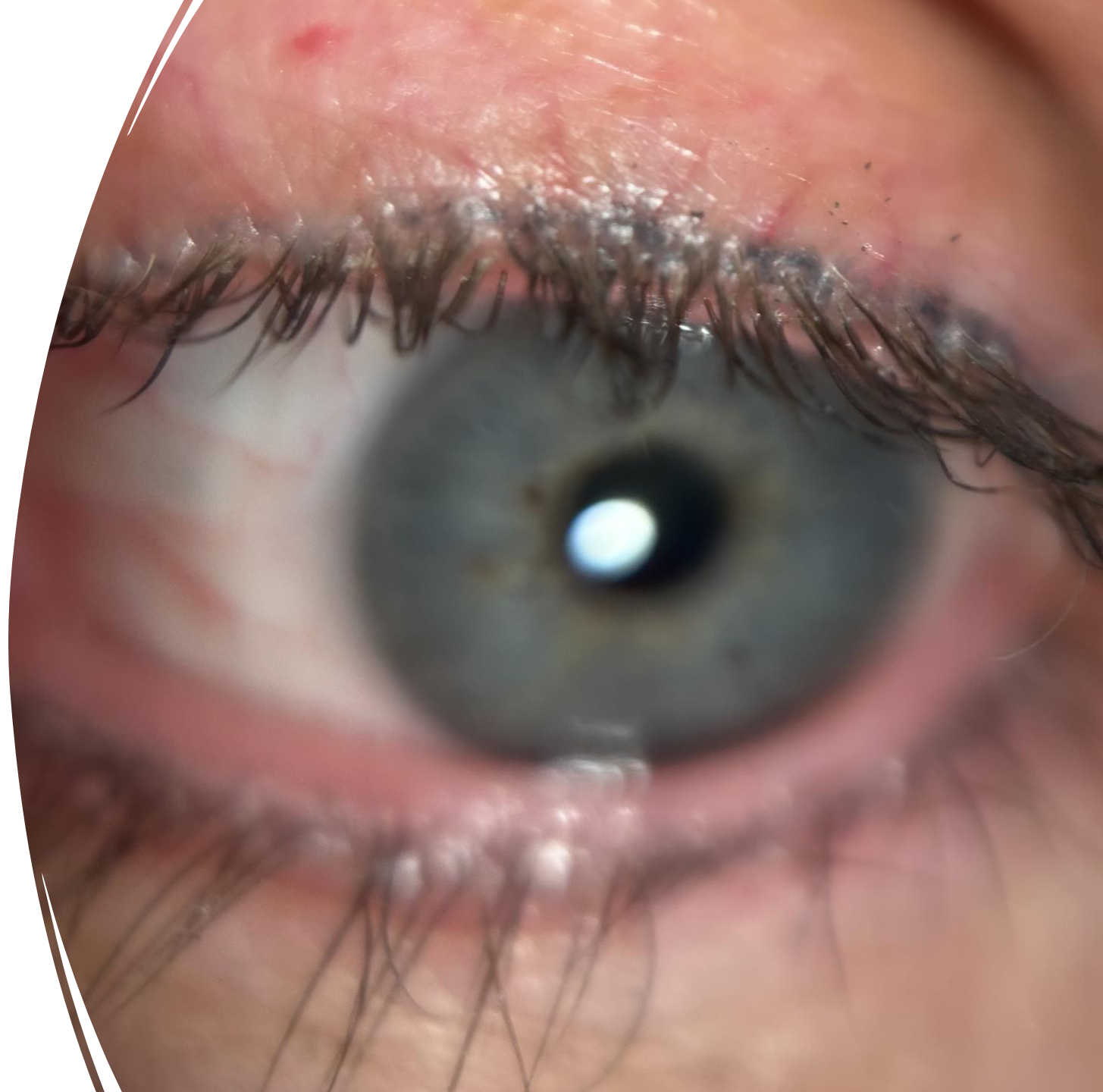




SMK vs CL Overwear
Syndrome

Resolve Corneal Infiltrate

- Antibiotic followed by a steroid if there is significant epi defect
- Antibiotic / Steroid Combo
- Steroid Alone





Treat Bacterial Overgrowth

- D/C Contact lens wear
- In office Treatment- Microblepharoexfoliation
- Topical Antibiotic drops or ointment – azithromycin, bacitracin, erythromycin
- Topical Antiparasitic - lotilaner
- Oral Doxycycline 20mg BID
- Lid Cleansers – Daily maintenance
- Makeup Removal
- Makeup Hygiene



Treatment Options

**Prescription
medications**

**At-home
treatments**

**In-office
treatments**

Prescription Treatments for Blepharitis

- Antibiotic Drops:
 - Moxifloxacin 0.5% ophthalmic solution
- Antibiotic /Steroid Combination Drops:
 - Tobramycin/Dexamethasone suspension
 - Tobramycin/Loteprednol Suspension
 - Neomycin-polymyxin-dexamethasone
- Ointments: antibiotic or antibiotic steroid combination
 - Erythromycin, Neomycin-polymyxin-dexamethasone, tobramycin-dexamethasone
- Topical Anti-parasitic
 - Lotilaner 0.25% solution

Mechanism of Lotilaner 0.25%

- Lotilaner functions as a **noncompetitive antagonist** of mite and arachnid GABA-gated chloride channels^{1,2}
- Directly paralyzes the mite nervous system through parasite-specific GABA inhibition, leading to death^{1,2}
- The lipophilic nature of the drop suggests its ability to flow into the oily sebum of the lash follicle where the mites reside³



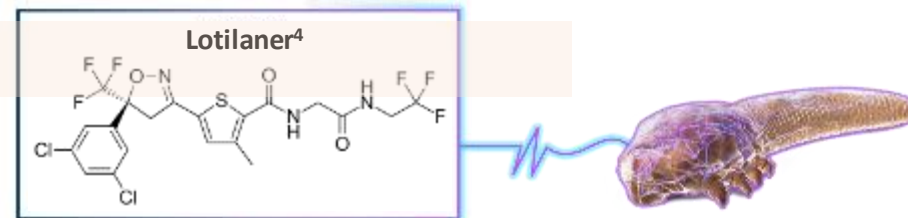
Product form⁵

Preserved (sorbate) multidose eye drop solution in bottle



Dosing⁵

Twice daily for 6 weeks



FDA, Food and Drug Administration; GABA, gamma aminobutyric acid.

1. Dailymed Credelio. Accessed June 28, 2022. <https://dailymed.nlm.nih.gov/dailymed/fda/fdaDrugXsl.cfm?setid=427f2ebc-ce24-452b-bbb3-43d4ef8b63b0> 2. Gonzalez-Salinas R et al. *J Ophthalmol*. 2021;3862684. 3. LianBio. Accessed June 28, 2022. <https://www.globenewswire.com/news-release/2022/05/03/2434549/0/en/LianBio-Partner-Tarsus-Pharmaceuticals-Announces-Positive-Topline-Data-from-Second-Pivotal-Trial-of-TP-03-for-the-Treatment-of-Demodex-Blepharitis.html>

4. ChemSrc Lotilaner. Accessed June 28, 2022. https://www.chemsrc.com/en/cas/1369852-71-0_1262257.html 5. Yeu E et al. *Cornea*. 2022; In Press.

SATURN-1 and SATURN-2

Pivotal Clinical Studies Of Treatment For *Demodex* Blepharitis



Consistent cures and **responses** demonstrated in **2 pivotal trials**, the largest clinical program for *Demodex* blepharitis, involving **833 patients**



The primary and all secondary endpoints (collarette cure, mite eradication, lid erythema) met with high statistical significance



Clinically and statistically significant effects seen as early as **2 weeks**



Very high responder rate: **96%** of patients improved at least 1 collarette grade; **89%** achieved a clinically meaningful cure



FDA Approved July 25, 2023



Efficacy goal

1° collarette cure rate,
2° mite eradication,
2° redness + collarette
cure rate



Safety goal

Well-tolerated safety
profile

In Office Procedure: Lid Cleansing with Micro Blepharo Exfoliation

- Easy to use in office procedure
- Out of pocket patient cost
- Removes Biofilm from lashes and inner lid margin
- Great for Contact lens wearers
- Can be repeated Q3-6 months





In Office Lid Treatment

Eyelid treatment System to treat Blepharitis and Inflammation

In office procedure for Blepharitis Treatment

Takes <10 minutes to complete

Kill the Bacteria / Mites

- Prescription Medications:
- Oral Doxycycline 20mg BID
- Topically:
- Apply (azithromycin, erythromycin, or steroid/antibiotic combo drops) directly to lid margins with clean fingertip
- QHS OU x 30 nights
- Lotilaner 0.25% ophthalmic solution

• At Home OTC Tx: Lid Cleansers

- Hypochlorous Acid Spray
- Foaming Lid Cleanser
- Lid Scrubs Pads:
- **NEVER USE BABY SHAMPOO!!!**

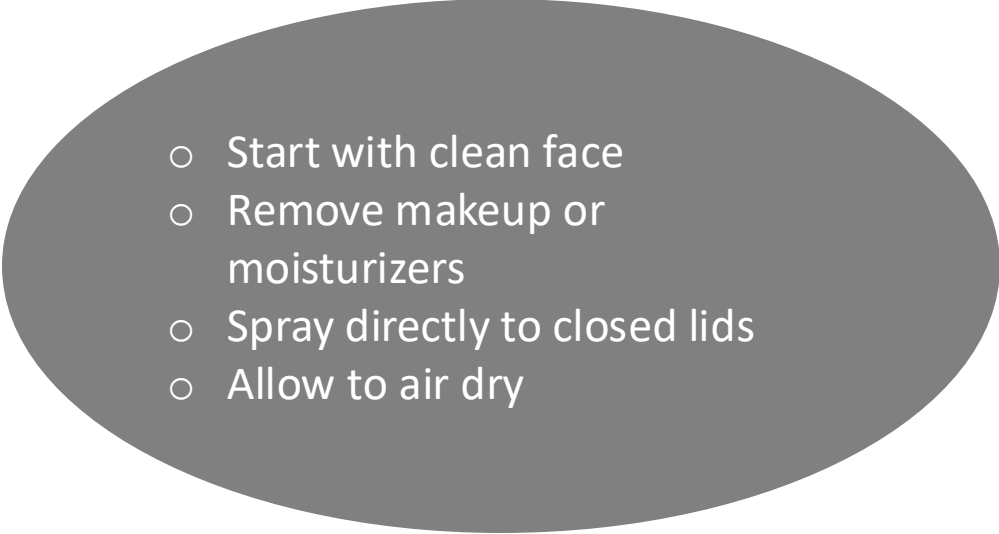


Blepharitis: At-Home Cleansing

- Remove Contact lenses
- Makeup Removal
- Lid Cleansers – Daily maintenance
 - Wipes
 - Foams
 - Spray

Lid and Lash Hypochlorous Acid Cleansing Sprays

- Hypochlorous Acid sprays: naturally produced in the cells of our body
- Natural defense against micro-organisms
- Great for killing staph bacteria around eyes

- 
- Start with clean face
 - Remove makeup or moisturizers
 - Spray directly to closed lids
 - Allow to air dry

PROS:

- Great for all skin types
- Found to kill COVID-19 virus
- Can also be applied to face
- Non-drying, Non-irritating
- Can also help to remove dust, dirt and pollens from lashes

CONS:

- Will not effectively eliminate Demodex when used alone
- Some concentrations can be irritating to very sensitive skin



Foaming Cleanser

PROS and CONS

- **PROS:**
 - Great to use in the shower
 - Can be used after makeup removal to cleanse lids
 - Better for oily skin types
- **CONS:**
 - Can be drying to the skin as many contain soap
 - May Contain Tea Tree Oil

Eyelid Wipes

PROS and CONS

- **PROS:**
 - Convenient
 - Easy to carry with you
- **CONS:**
 - Extra waste products due to individual packaging
 - Most still need to be rinsed away
 - May Contain Tea Tree Oil





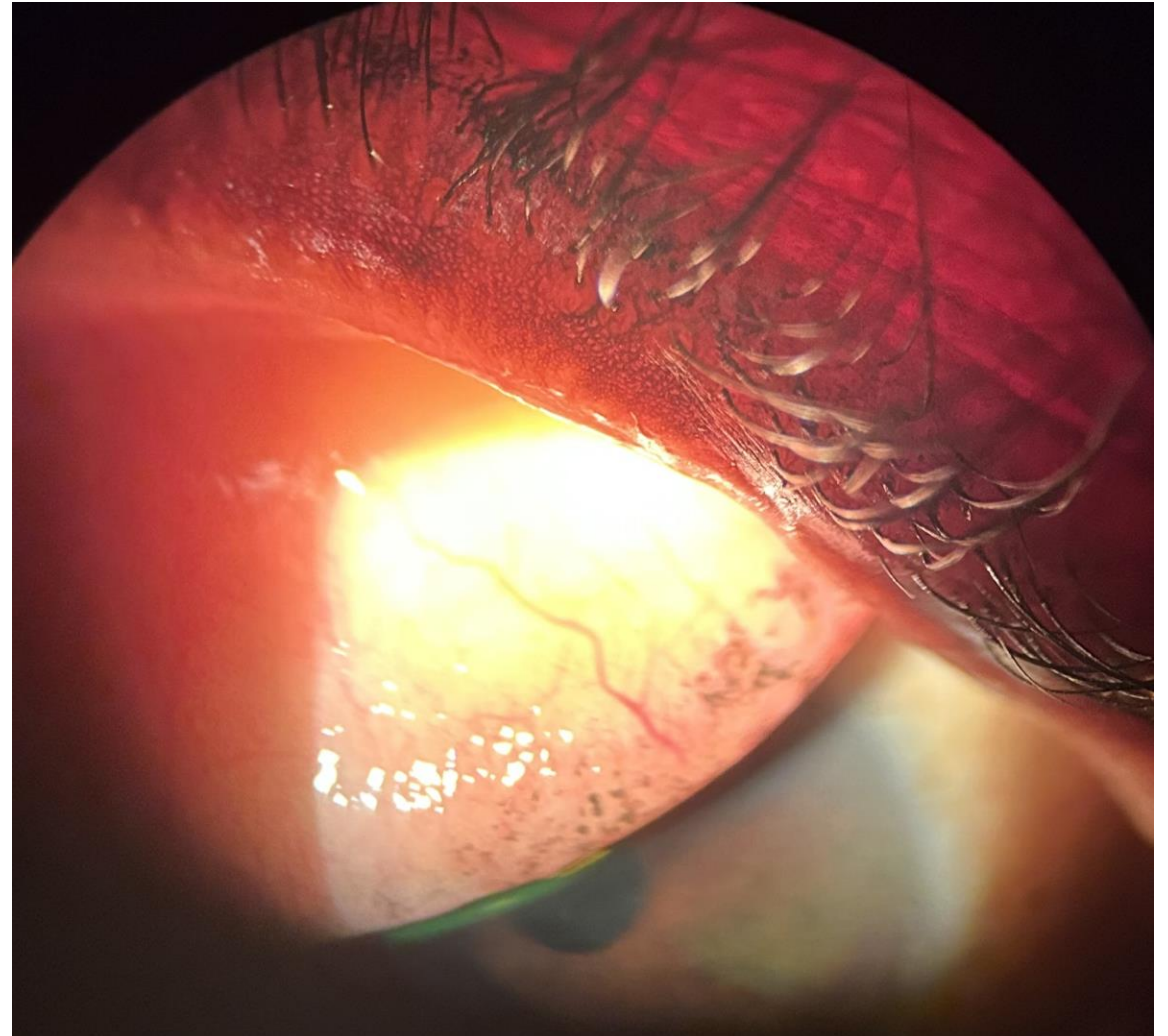
5 Categories of Makeup Removers

- Micellar
- Oil-Free
- Oil-Based
- Wipes
- Cloths

Must Remove Eye Makeup
Every Night

Makeup Rules for Best Ocular Health

- Always remove makeup nightly
- No water-proof makeup
- No glitter in your eye shadow
- Avoid powdered eye shadow
- Apply primer to lids before shadow and liner
- Pencil eye liners are best
- No water-lining or tight-lining
- Avoid toxic and irritating ingredients
- Toss out your makeup on time
- Never share your eye makeup
- Never Moisten cosmetics with saliva
- Never alter your makeup with heat
- Never apply makeup on the go
- Never put a product not intended for the eye on the eye



If not you,
then
who...



the *never* list™

WHEN FORMULATING OUR PRODUCTS, WE PROHIBIT THE USE OF OVER
1,500 HARMFUL OR QUESTIONABLE INGREDIENTS.

Benzalkonium chloride · BHA and BHT · Coal tar · Ethylenediaminetetraacetic
acid (EDTA) · Ethanolamines (MEA/DEA/TEA) · Formaldehyde · Hydroquinone ·
Methylisothiazolinone and methylchloroisothiazolinone · Oxybenzone · Parabens
(methyl-, isobutyl-, propyl- and others) · Phthalates · Polyethylene glycol
(PEG compounds) · Retinyl palmitate and Retinol (Vitamin A) · Sodium lauryl
sulfate and Sodium laureth sulfate (SLS and SLES) · Synthetic flavor or fragrance ·
Toluene · Triclosan and Triclocarban





Got Questions?

- www.pamtheriot.com
- Pam@pamtheriot.com

COPE Event 132027

COPE Course # 99731-TD : Differentiating Keratitis

Thank You



On behalf of Vision Expo, we sincerely thank you for being with us this year.

Reminder to Complete Your Session Evaluations!

Please be sure to complete your digital session evaluations for each course you attended! Your feedback is important to us as our Education Planning Committee considers content and speakers for future meetings to provide you with the best education possible.

