Herpes Simplex Viral Keratitis: An Update

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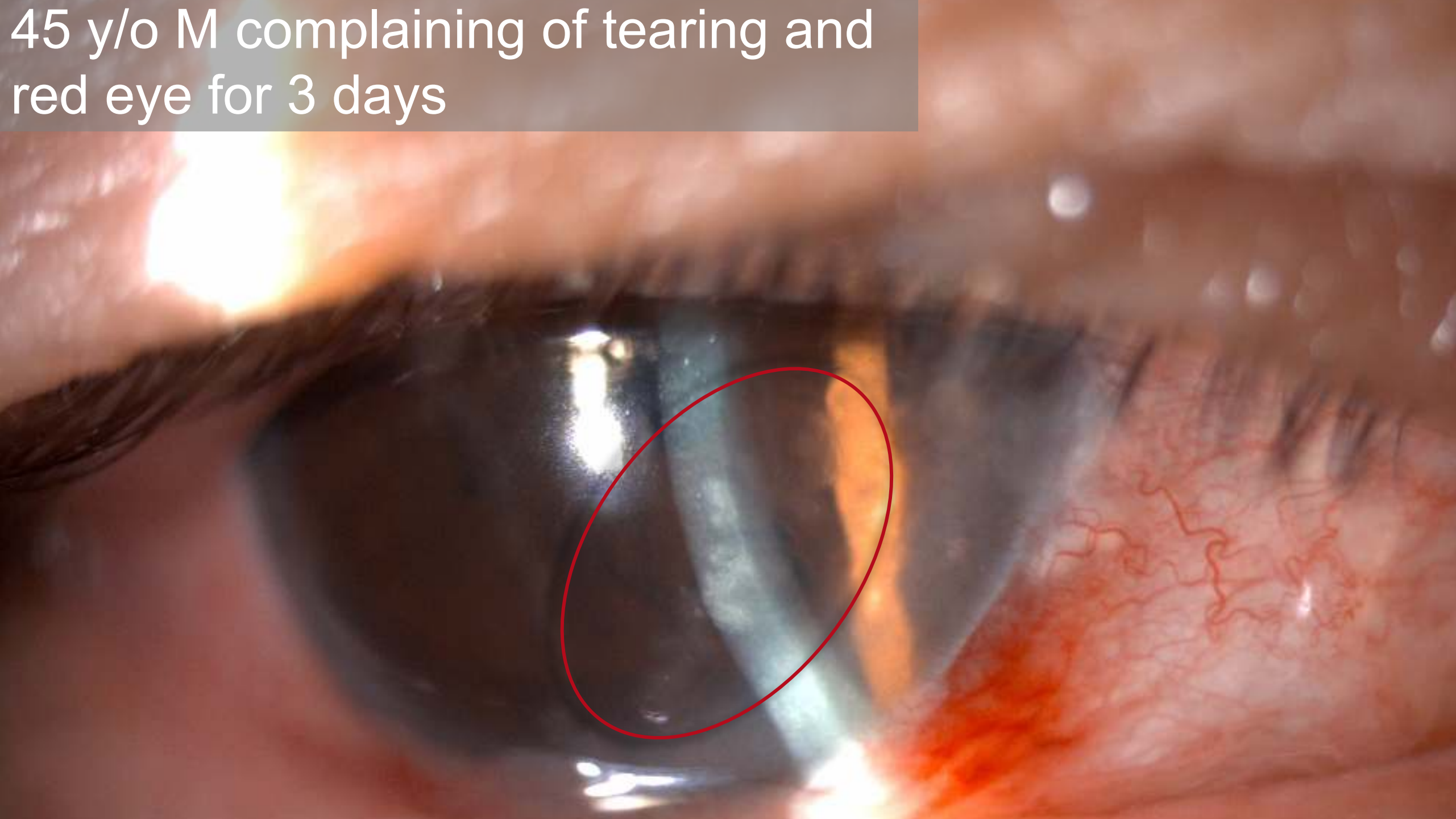
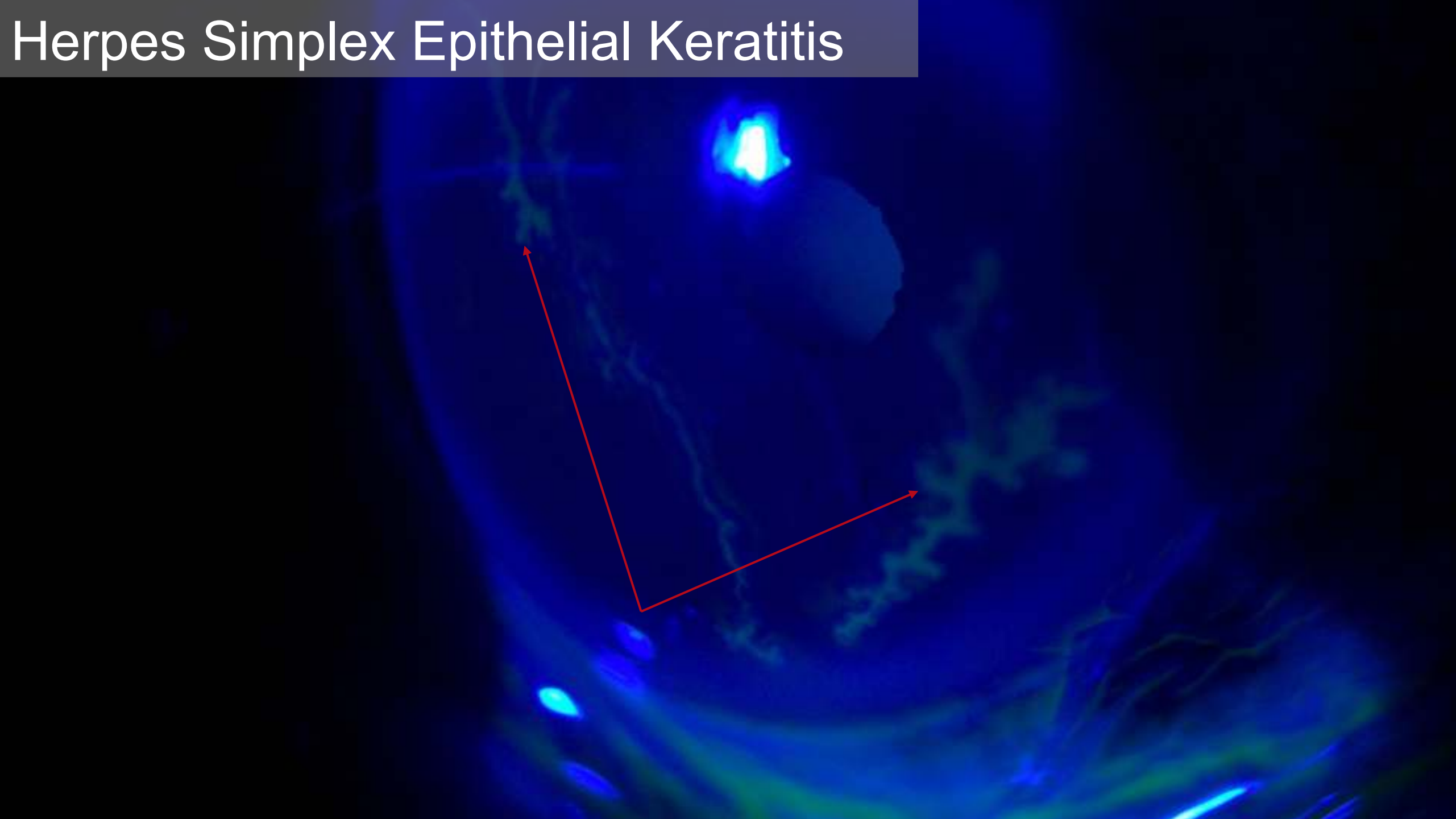
Sayyad Eye Center

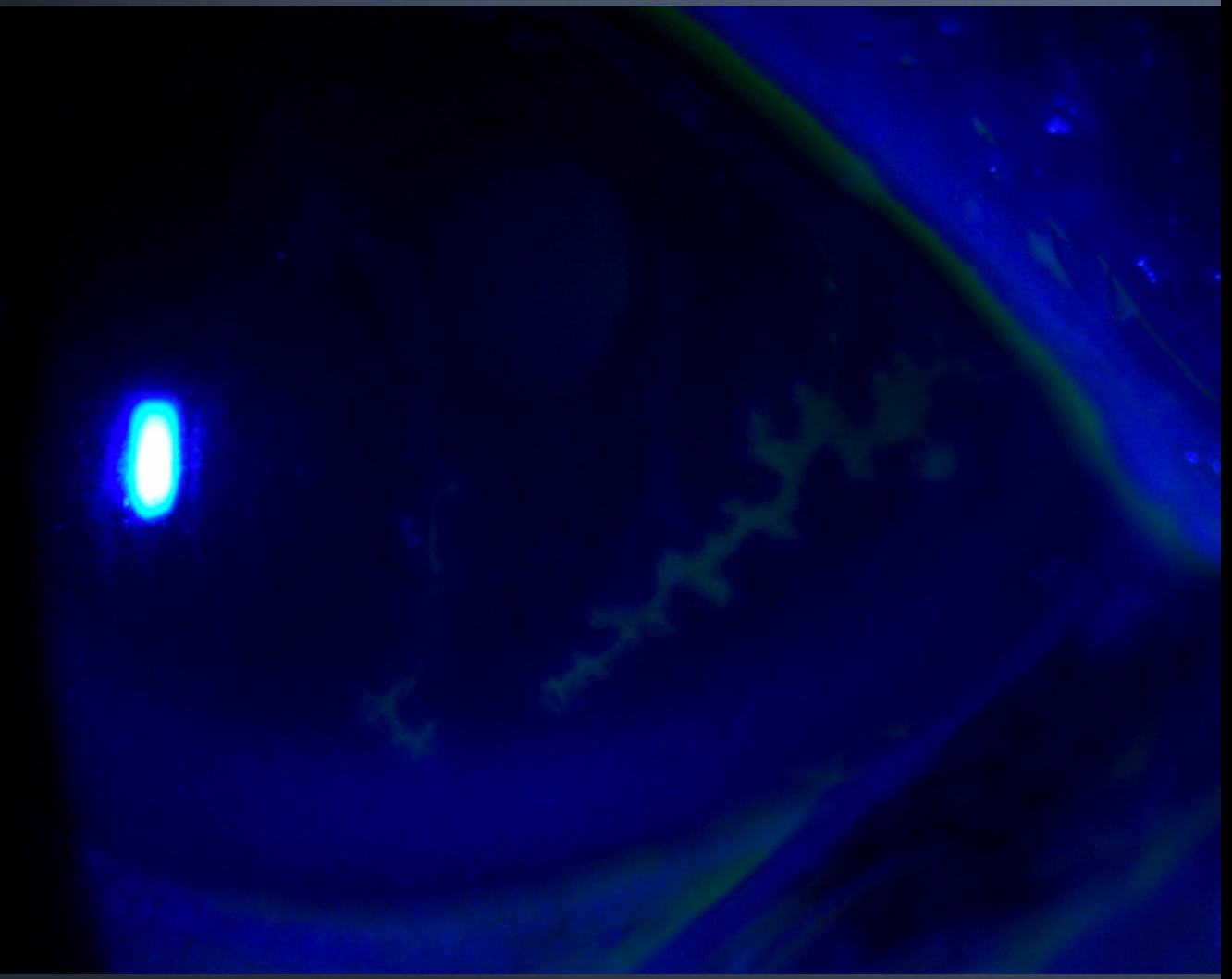
Financial Disclosures

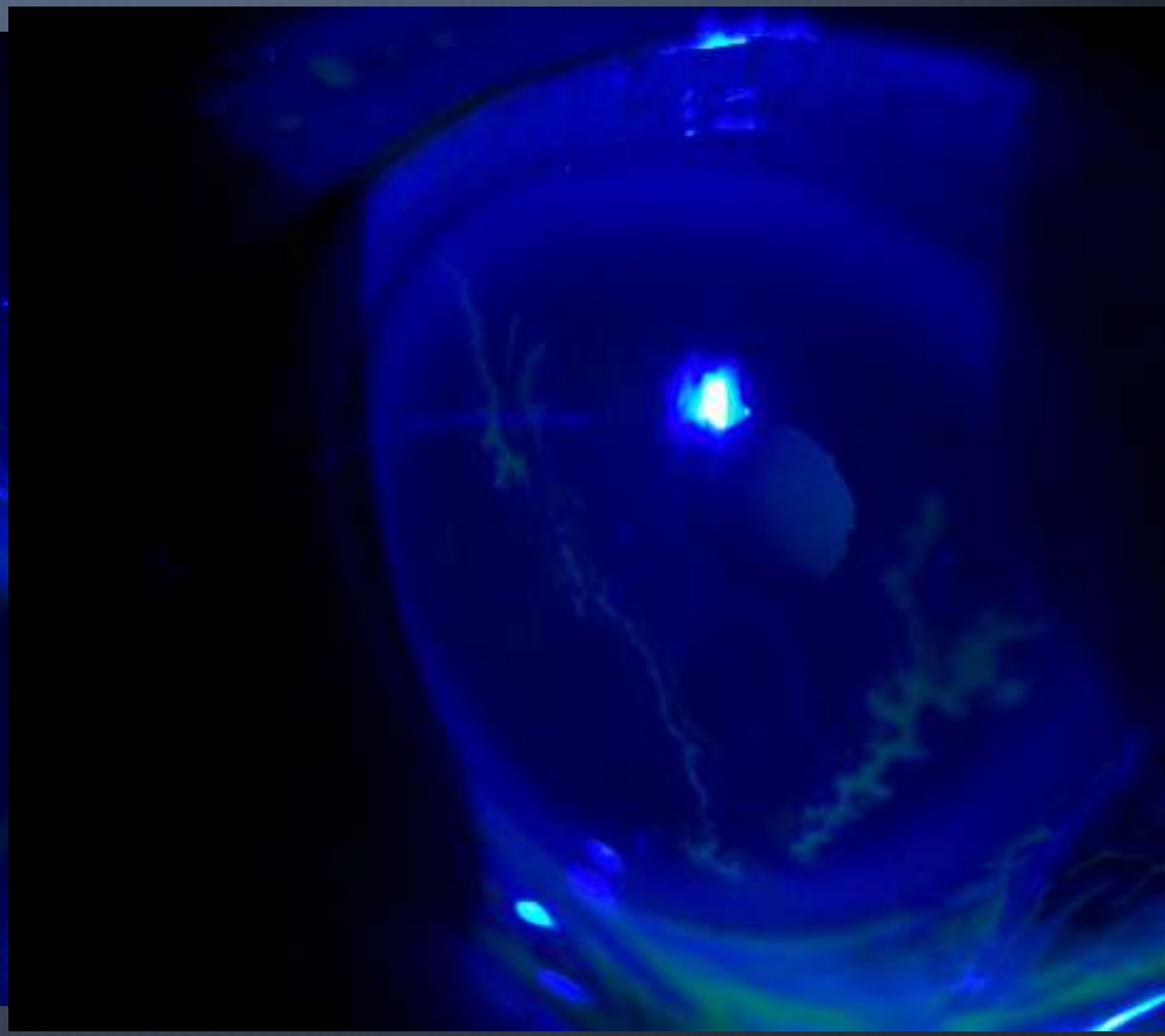
I have no financial interests.


45 y/o M complaining of tearing and red eye for 3 days

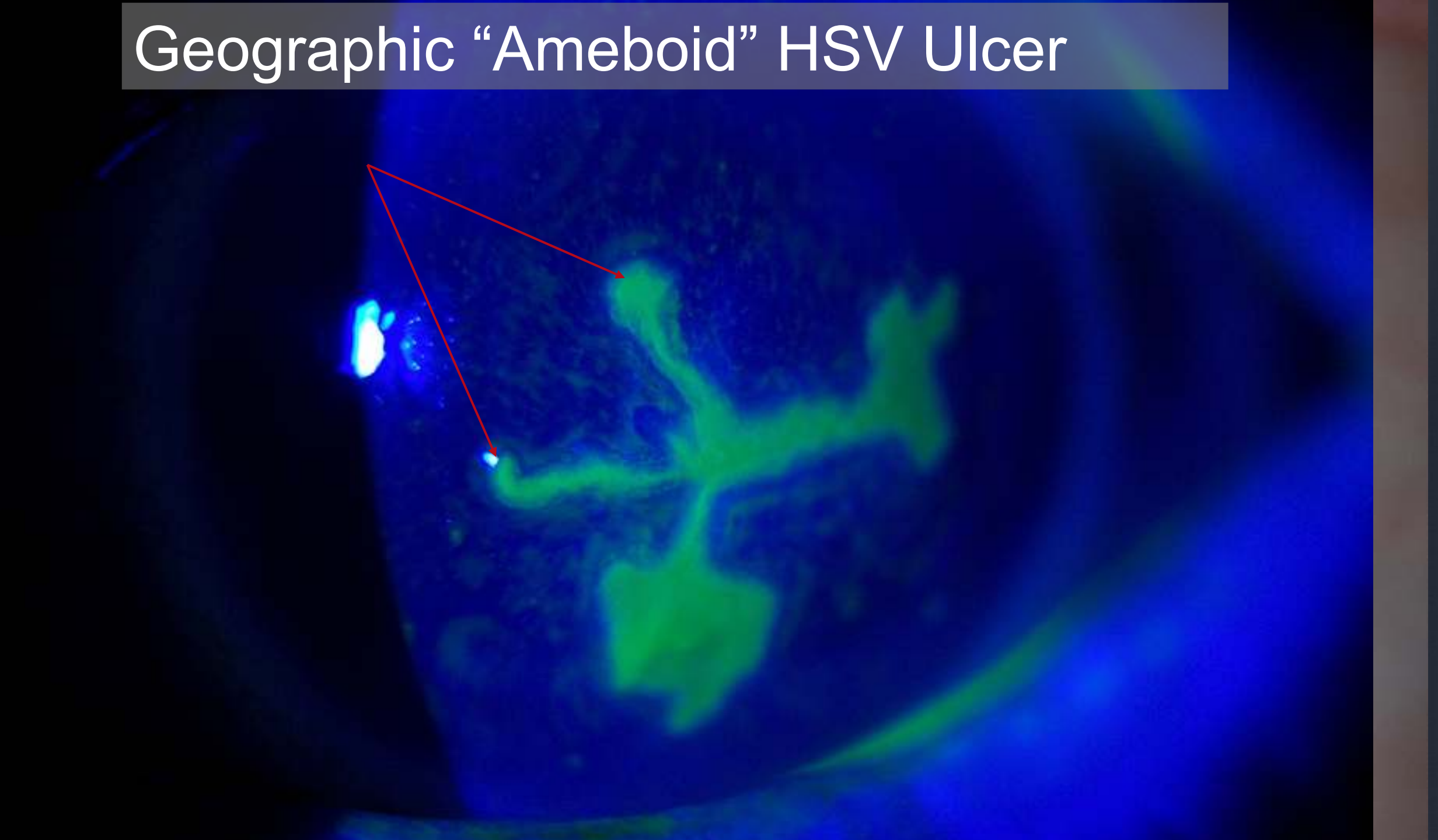
Herpes Simplex Epithelial Keratitis







Geographic “Ameboid” HSV Ulcer

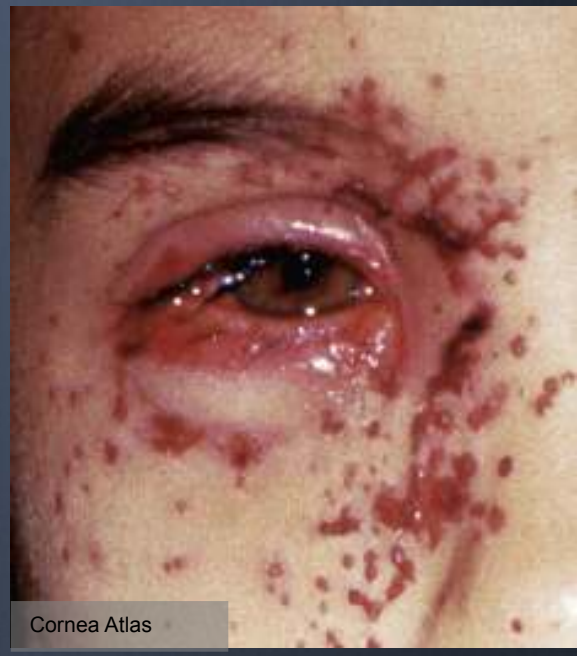


Herpes Simplex Viral Keratitis

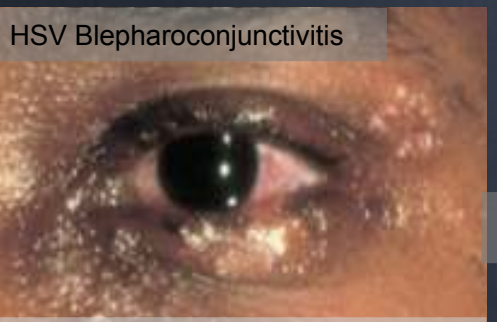
- Worldwide public health problem (≈ 1/3 of the global population)
  - > 90 % affected by age 60
  - 60% of patients are asymptomatic

- Primary infection – During childhood; conjunctivitis, or rash
  Affects the trigeminal ganglion

Chronic and Recurrent


Cornea Atlas

Stromal HSV keratitis is **leading cause of unilateral corneal blindness in developed countries**


HSV Blepharoconjunctivitis

2023 Cornea and external eye disease BCSC


Eyenet, 2013

Unilateral Conjunctivitis
SUSPECT HSV!


HSV Iridocyclitis

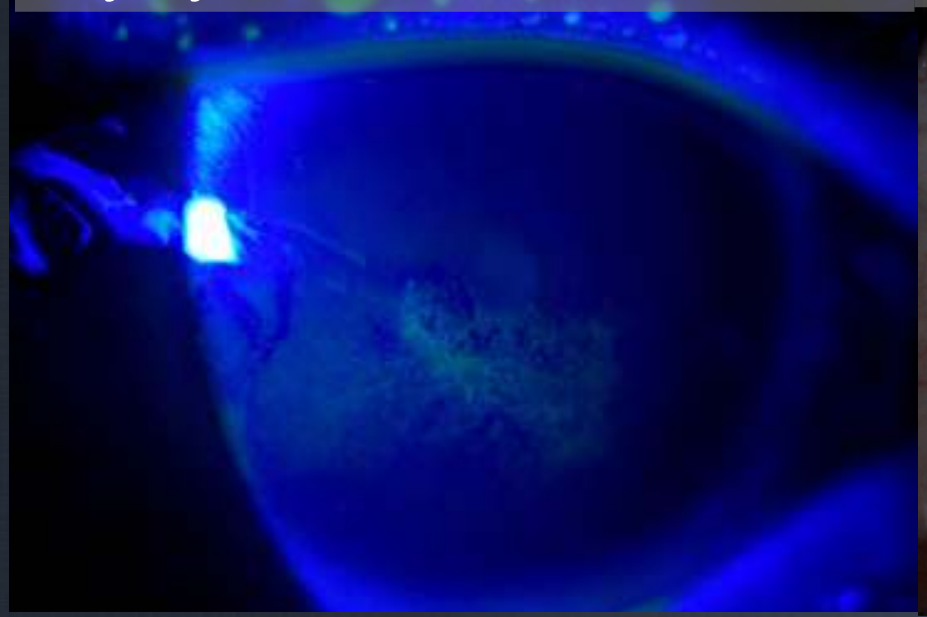

HSV scleritis


Advanced scarring

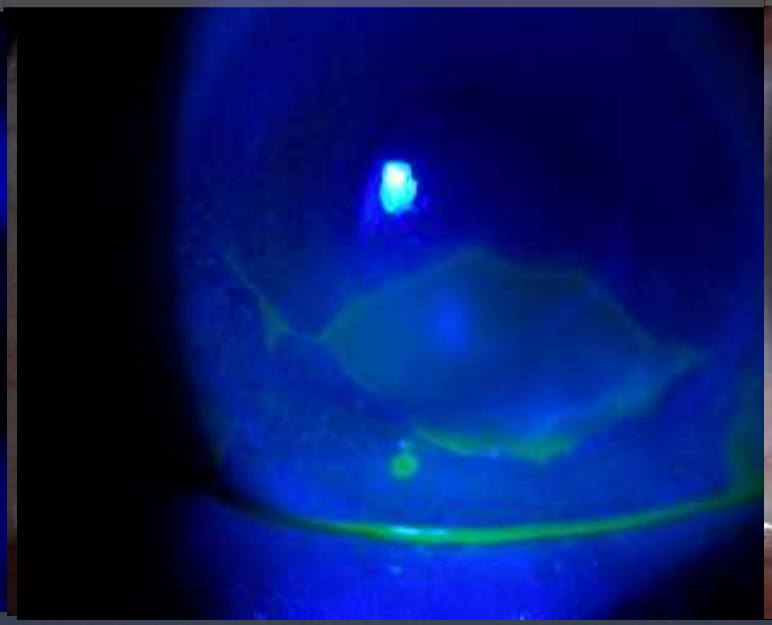
Why is HSV a diagnostic challenge

Frequently missed or misdiagnosed known as the “ Great Mimicker”

Dry eyes /Medicamentosa

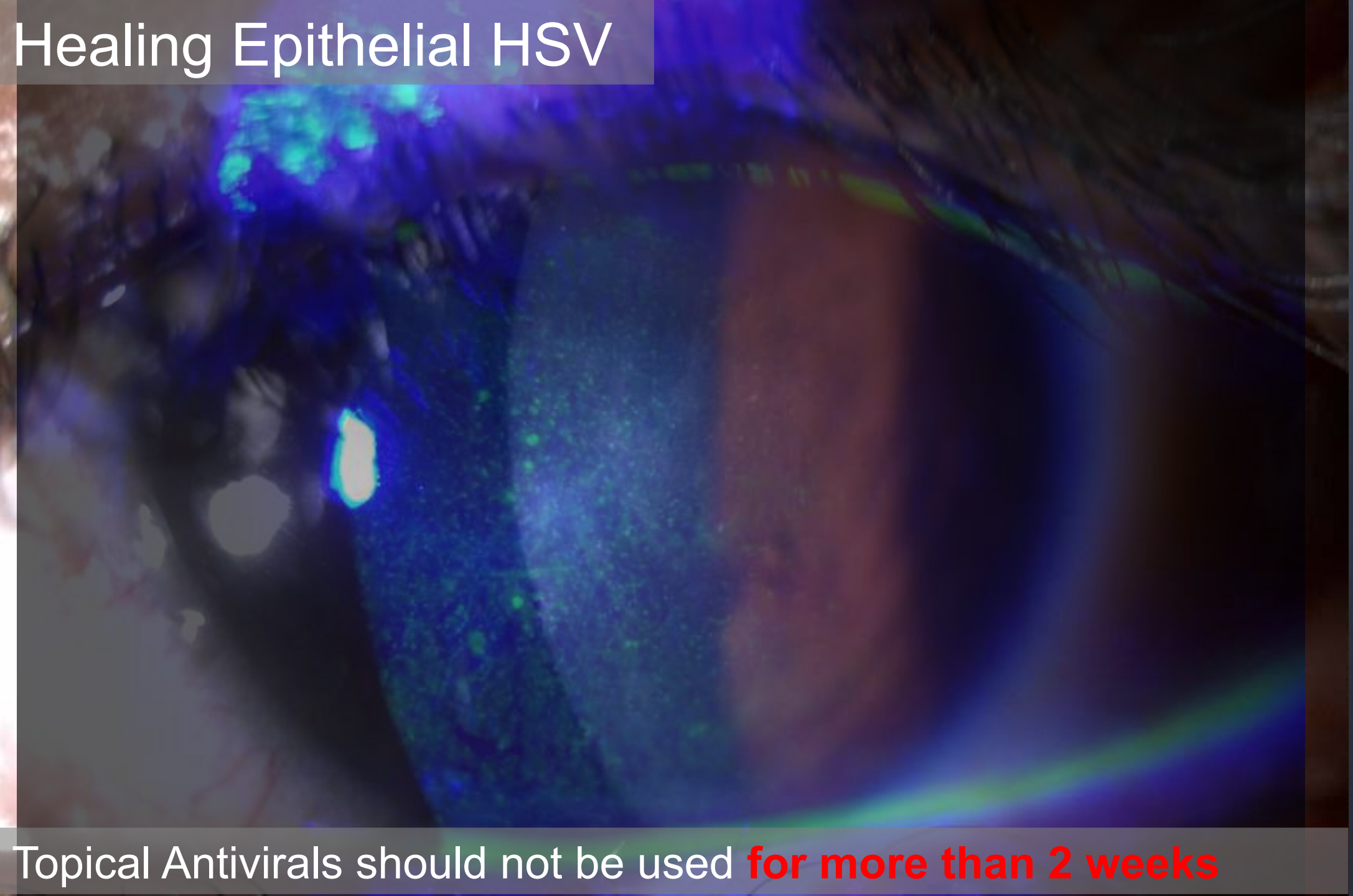


Neurotrophic Keratitis



?Bacterial or Fungal keratitis

Long-term use of antivirals and steroids can modify the clinical presentation


Healing Epithelial HSV
Topical Antivirals should not be used for more than 2 weeks

46 y/o M complaining of tearing and red eye

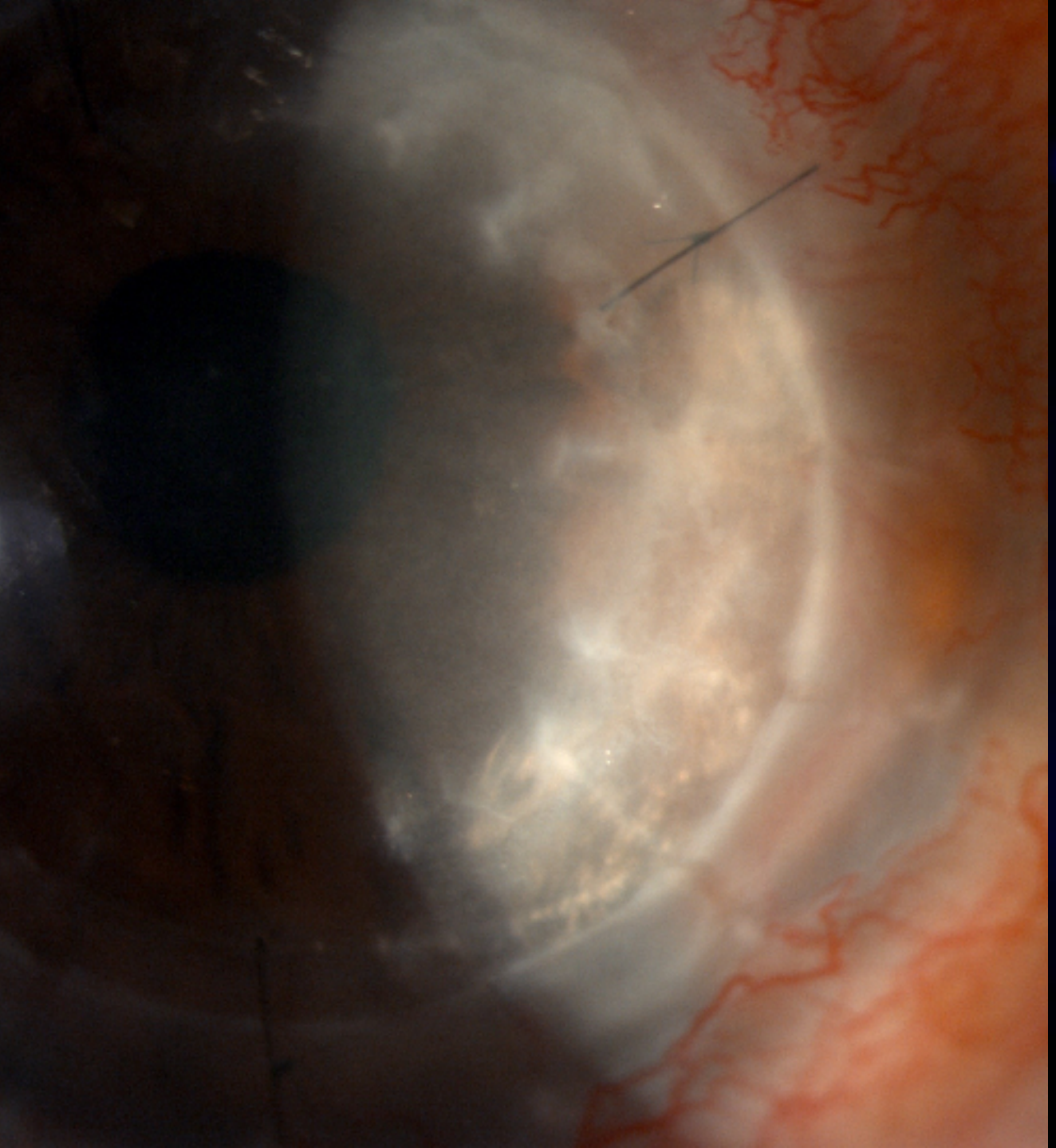
- Referred for possible corneal graft rejection
- Was given Prednisolone Q2hrs

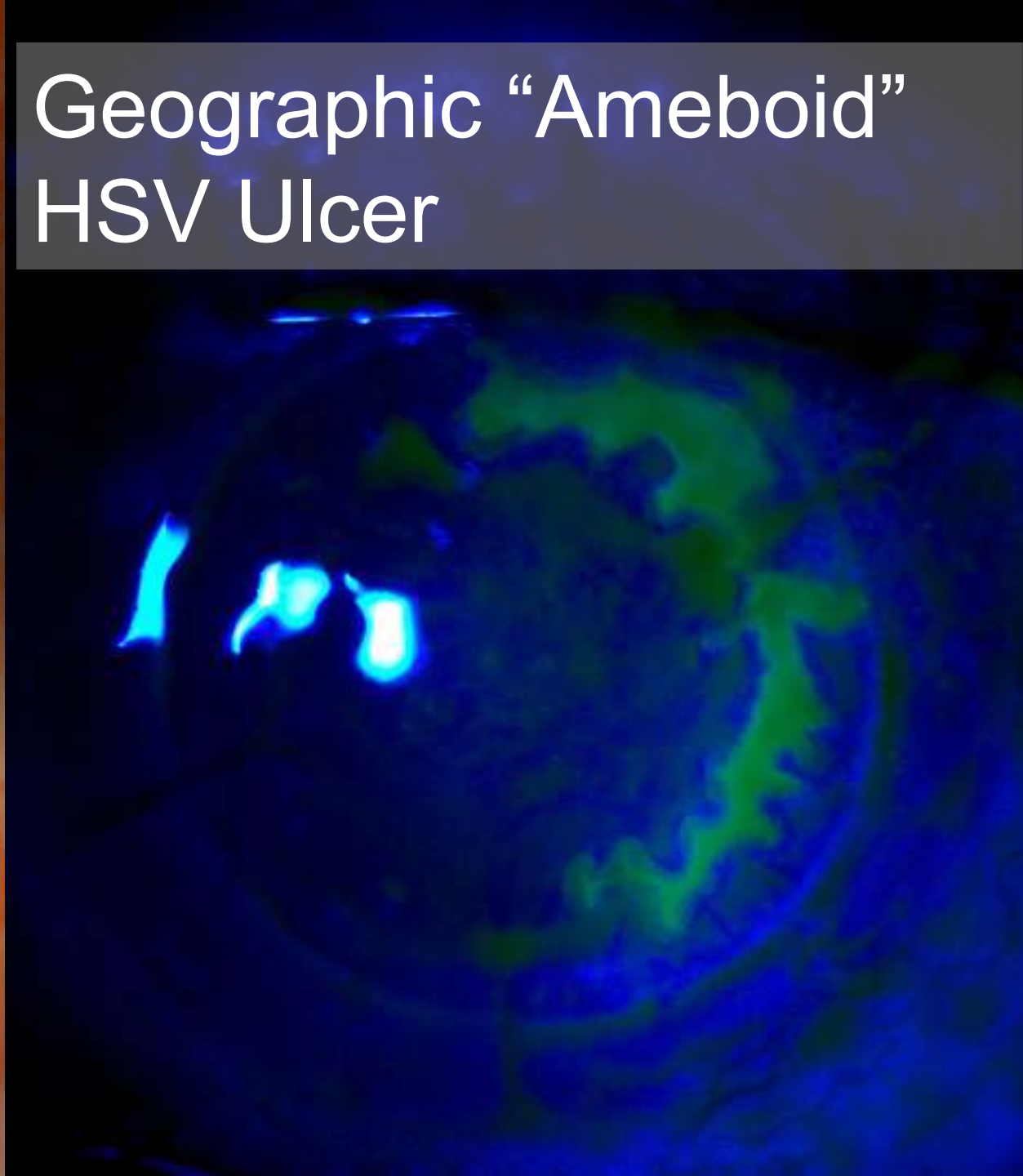
Ciliary injection

Epithelial/stromal edema

Photo 6 months earlier

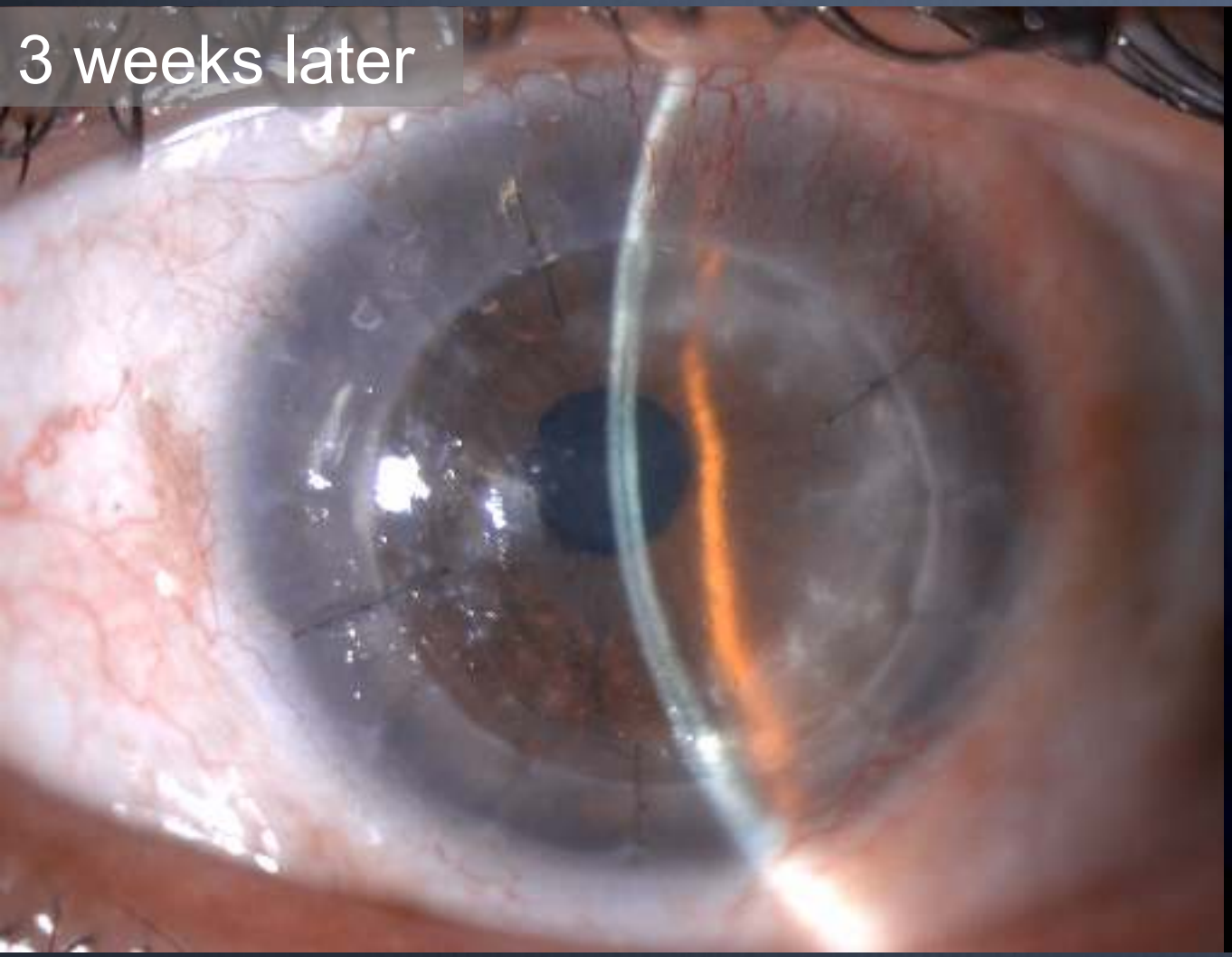
Geographic “Ameboid” HSV Ulcer

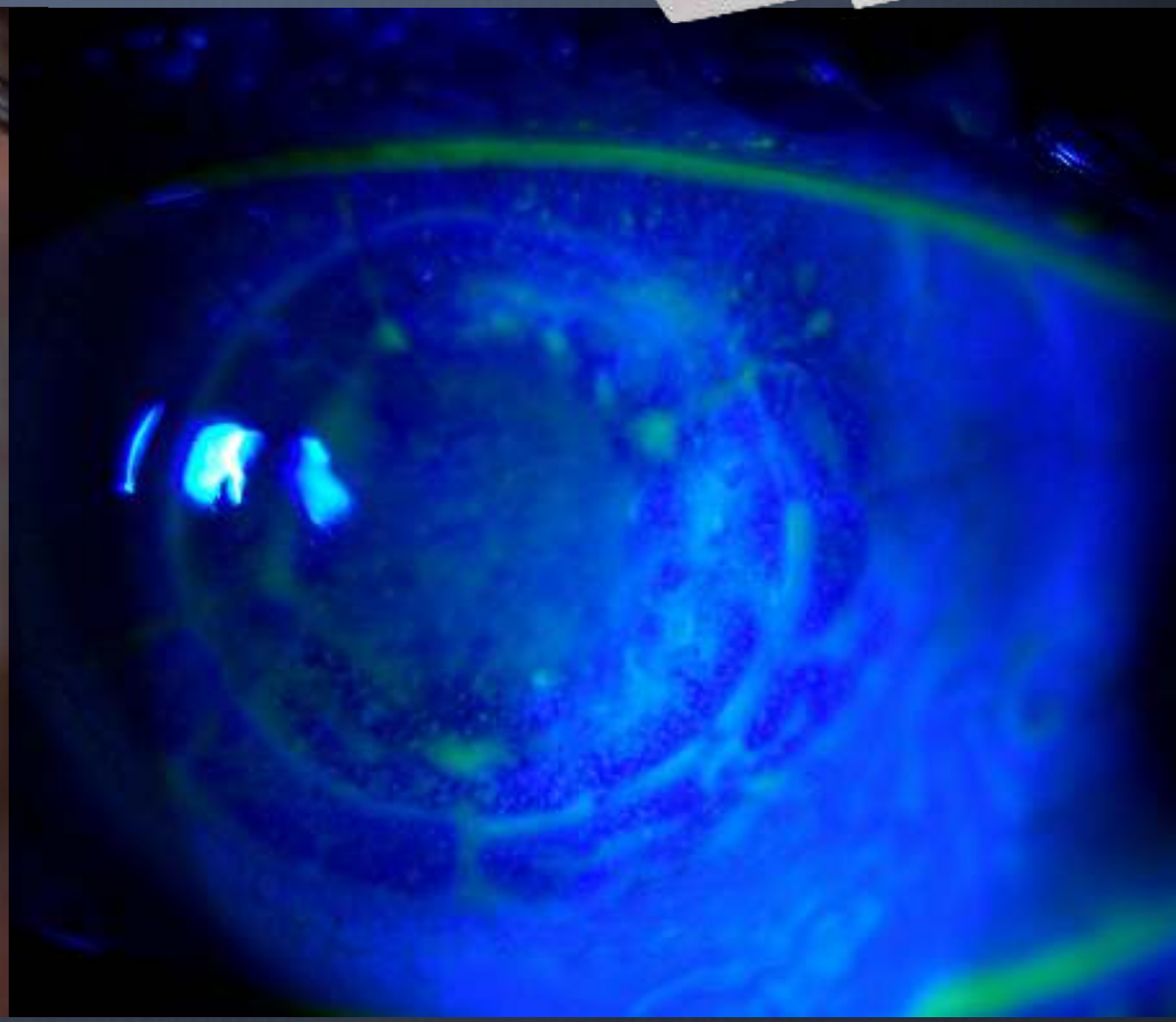




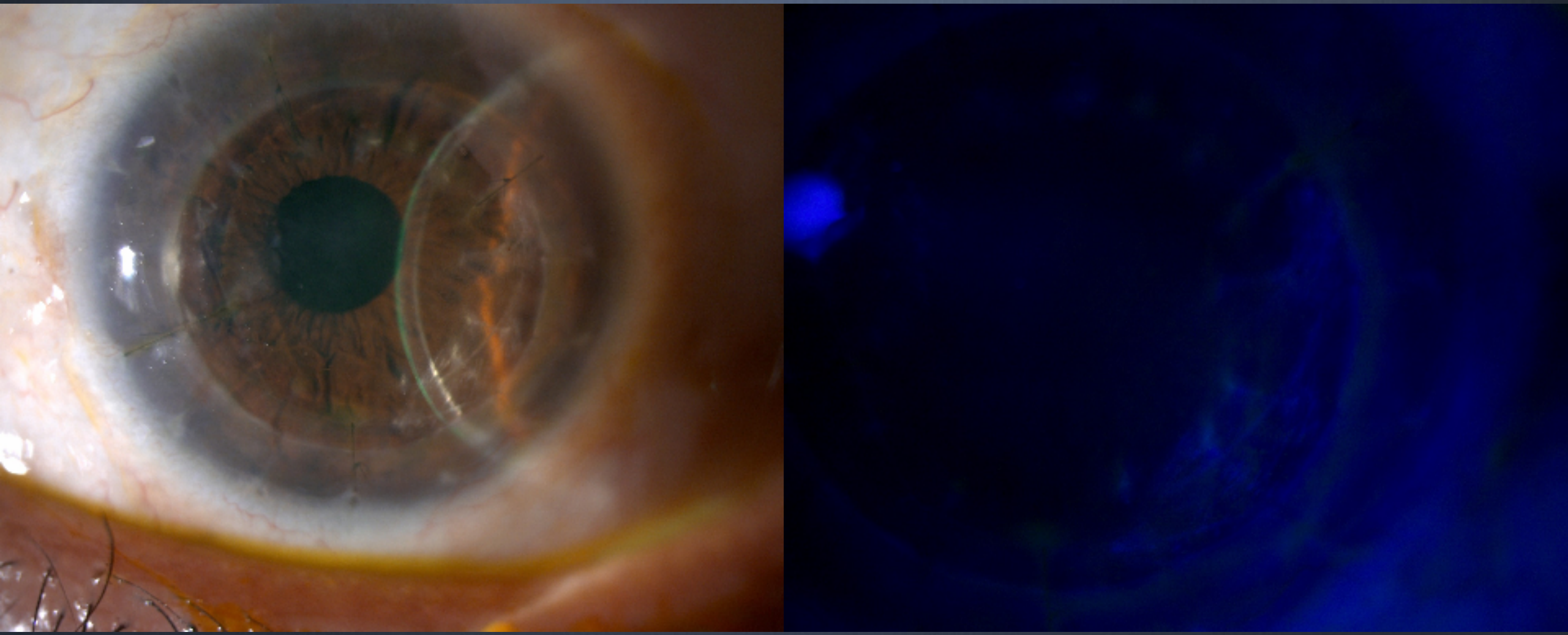
Started on Acyclovir ointment 4 x day

3 weeks later

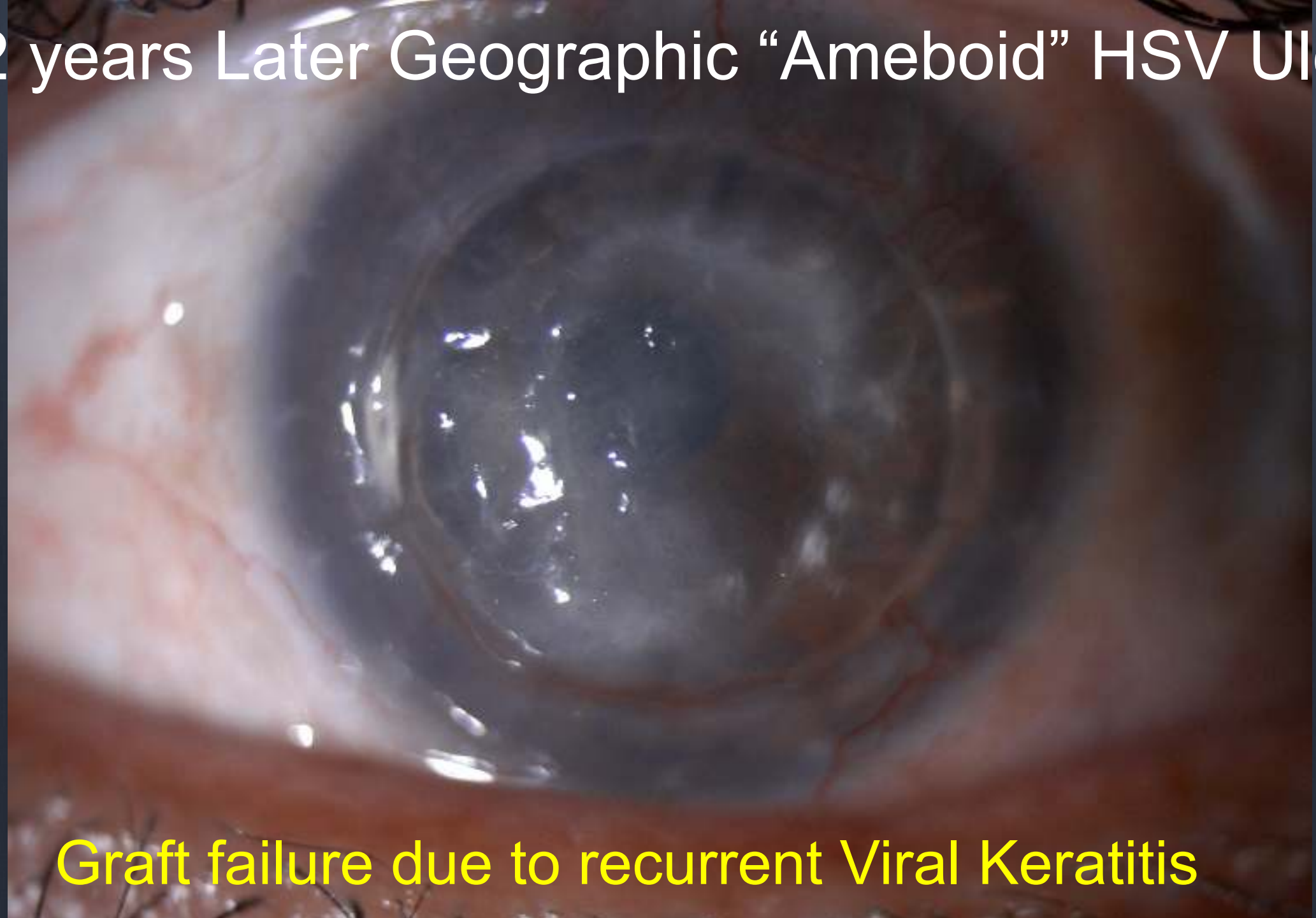




5 months after presentation

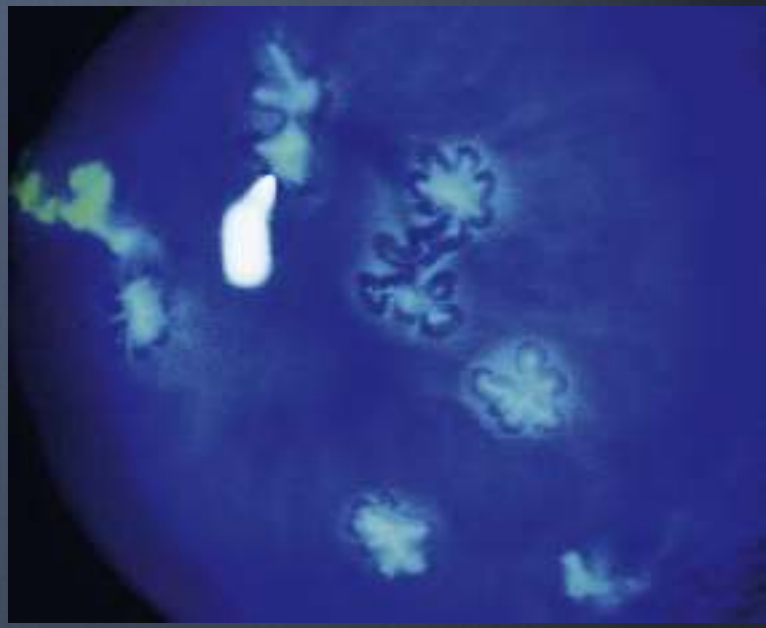


2 years Later Geographic “Ameboid” HSV Ulcer



Graft failure due to recurrent Viral Keratitis

Treatment of Epithelial HSV



Debridement (reduces treatment time)

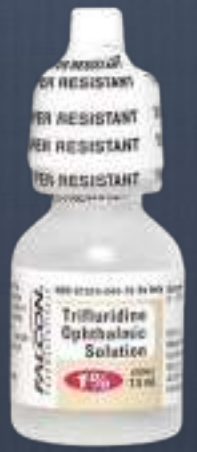
Topical treatment

Trifluridine 1% (More common in the US)
- Causes ocular surface toxicity

Acyclovir 3% (Ointment or drops)
- First line in Europe
- Less ocular toxicity

Ganciclovir gel 0.15% (Ointment or drops)
- Broad spectrum, can also treat CMV

AVOID Topical Steroids

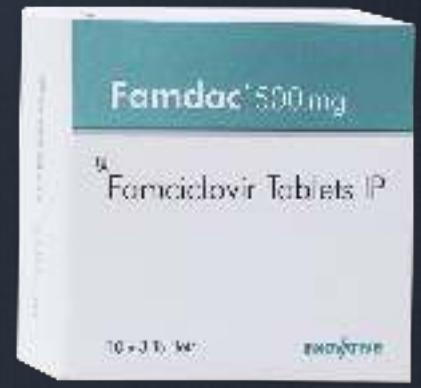


Dutt S et al. Clinical efficacy of oral and topical acyclovir in herpes simplex virus stromal necrotizing keratitis. Indian J Ophthalmol 2016;64:292-5.

Oral Antivirals in HSV Epithelial Keratitis

2-3 week course

Acyclovir	400-800mg 3-5 x day
Valacyclovir	500-1000mg 2 x day (check LFTs)
Famciclovir	250-500mg 2 x day



Oral Acyclovir for the Management of Herpes Simplex Virus Keratitis in Children

Gary S. Schwartz, MD,[1,2] Edward J. Holland, MD[1]

No optimal dose has been given due to lack of studies

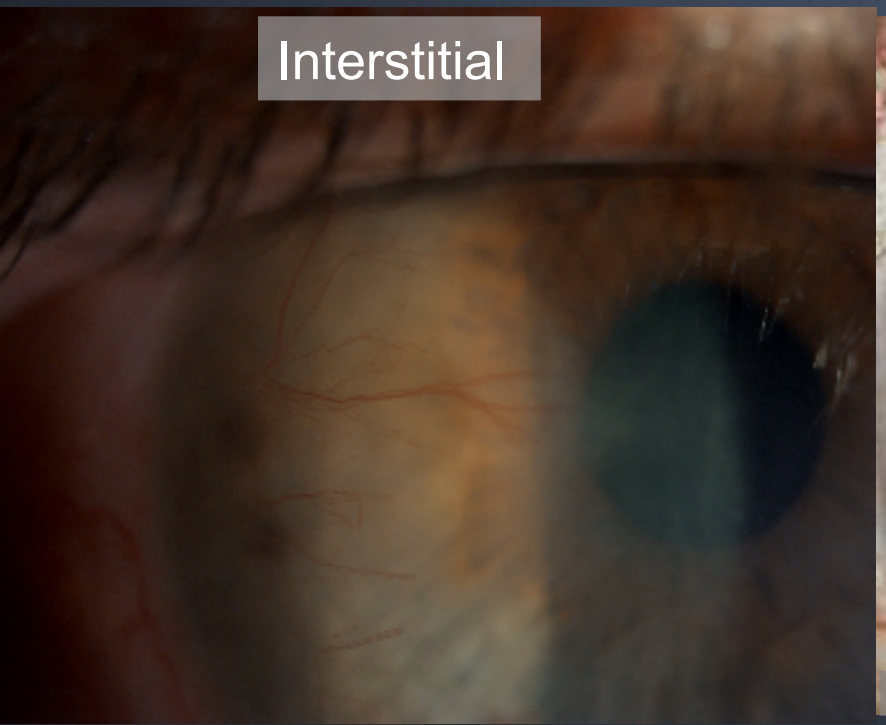
Oral acyclovir (Zovirax) in herpes simplex dendritic corneal ulceration Collum LM, et al.. Br J Ophthalmol. 1986;70:435–8.

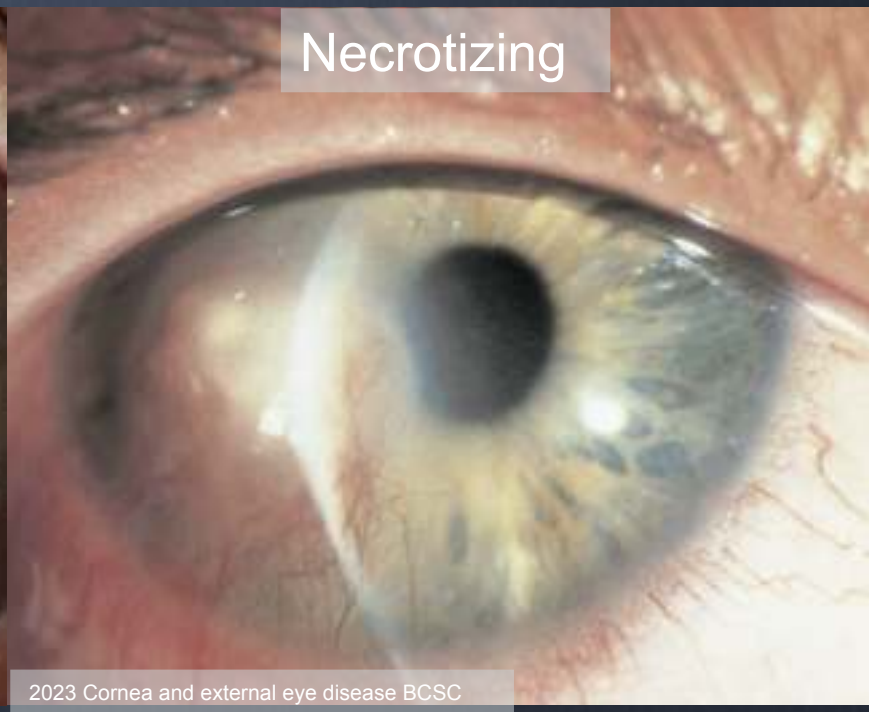
Stromal Herpetic Keratitis

Associated with the greatest visual morbidity

Immunologic activity against the virus. (Live virus may be present)

Non- Necrotizing



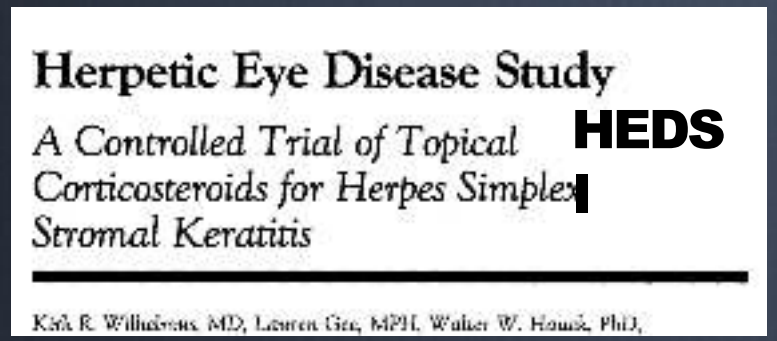


Herpetic Eye Disease Study (HEDS)

Answered past controversies regarding the optimal management of stromal keratitis

Double masked, Randomized Clinical Trial (1989-1994)

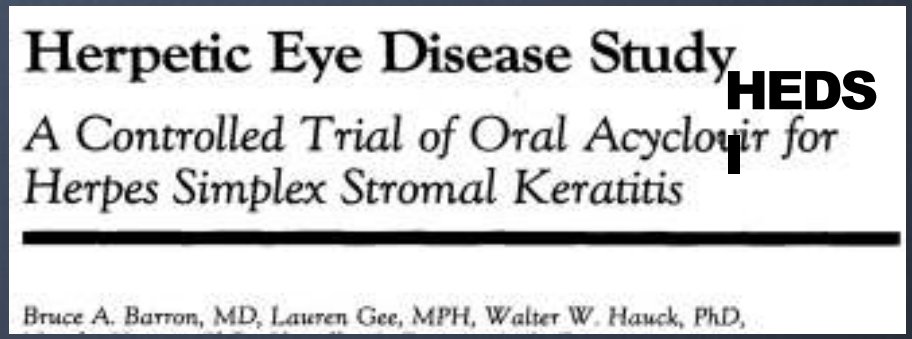
Goal was to determine best treatment for HSV Keratitis and Iridocyclitis


Herpetic Eye Disease Study

A Controlled Trial of Topical Corticosteroids for Herpes Simplex Stromal Keratitis

HEDS I

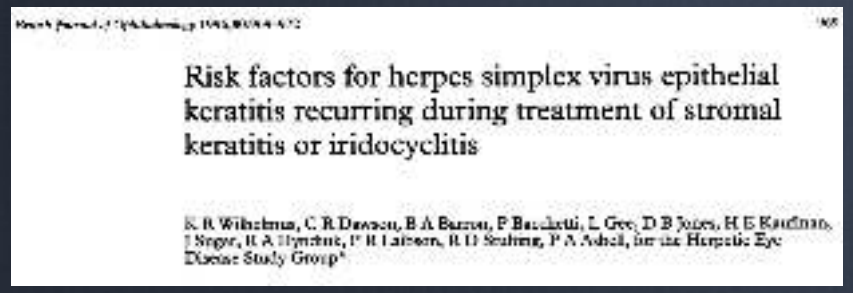
Kirk R. Wilhelmus, MD, Lauren Gee, MPH, Walter W. Hauck, PhD,


Herpetic Eye Disease Study

A Controlled Trial of Oral Acyclovir for Herpes Simplex Stromal Keratitis

HEDS I

Bruce A. Barron, MD, Lauren Gee, MPH, Walter W. Hauck, PhD,


Risk factors for herpes simplex virus epithelial keratitis recurring during treatment of stromal keratitis or iridocyclitis

K. R. Wilhelmus, C. R. Dawson, B. A. Barron, P. Bacchetti, L. Gee, D. B. Jones, H. E. Kaufman, J. Singer, R. A. Hyndiuk, P. R. Laibson, R. D. Stulting, P. A. Asbell, for the Herpetic Eye Disease Study Group*


The New England Journal of Medicine

ACYCLOVIR FOR THE PREVENTION OF RECURRENT HERPES SIMPLEX VIRUS EYE DISEASE

THE HERPETIC EYE DISEASE STUDY GROUP*

HEDS II

Herpetic Eye Disease Study Group. A controlled trial of oral acyclovir for iridocyclitis caused by herpes simplex virus. *Arch Ophthalmol.* 1996;114(9):1065–1072.
Herpetic Eye Disease Study Group. A controlled trial of oral acyclovir for the prevention of stromal keratitis or iritis in patients with herpes simplex virus epithelial keratitis. The Epithelial Keratitis Trial. *Arch Ophthalmol.* 1997;115(6):703–712.
Herpetic Eye Disease Study Group. Acyclovir for the prevention of recurrent herpes simplex virus eye disease. *N Engl J Med.* 1998;339(5):300–306.
Herpetic Eye Disease Study Group. Oral acyclovir for herpes simplex virus eye disease: effect on prevention of epithelial keratitis and stromal keratitis. *Arch Ophthalmol.* 2000;118(8):1030–1036.

Management of Stromal Keratitis

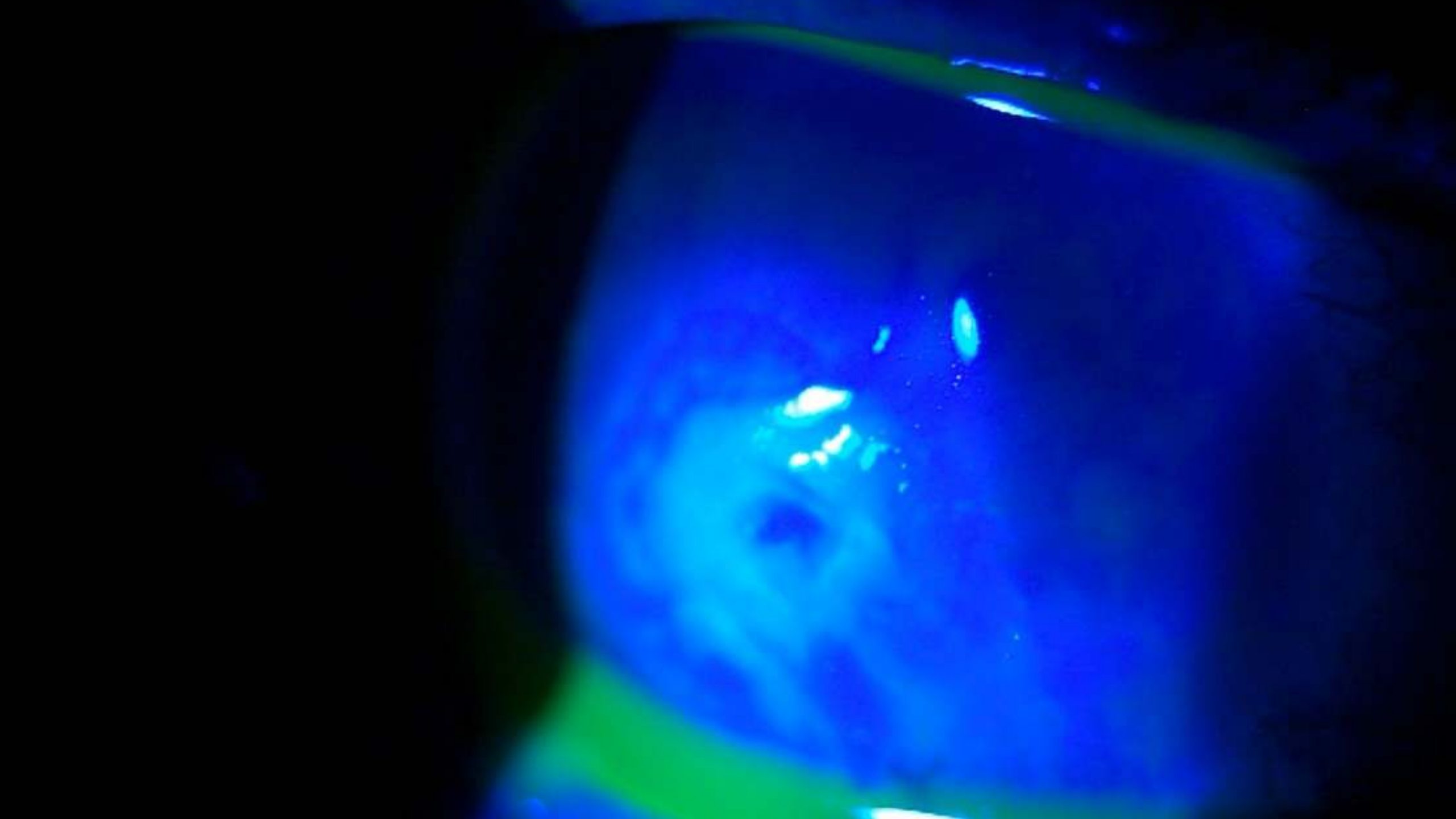
Oral Antivirals

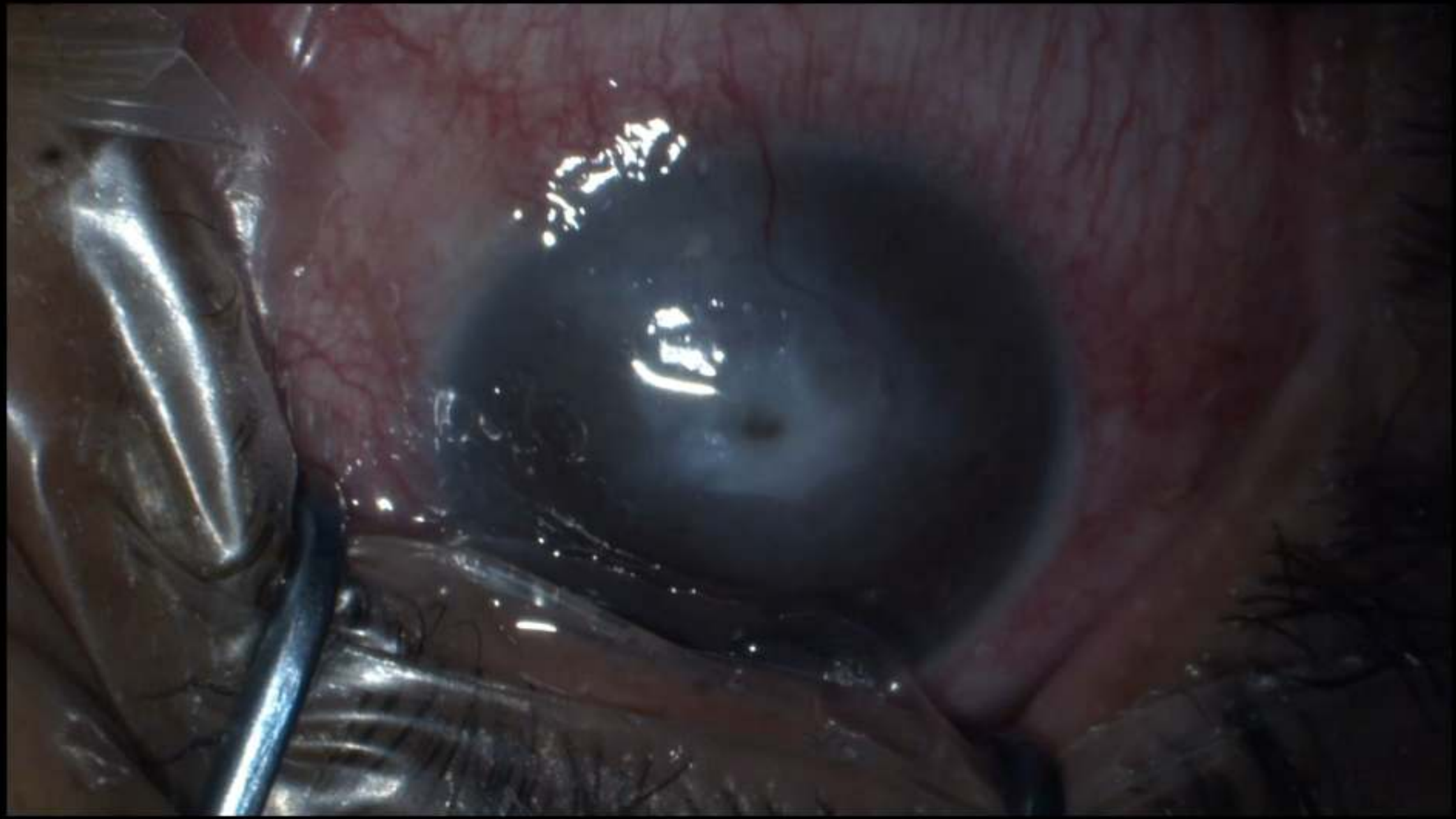
Acyclovir
400mg 4-5 x day Prophylaxis : 400mg 2 x day

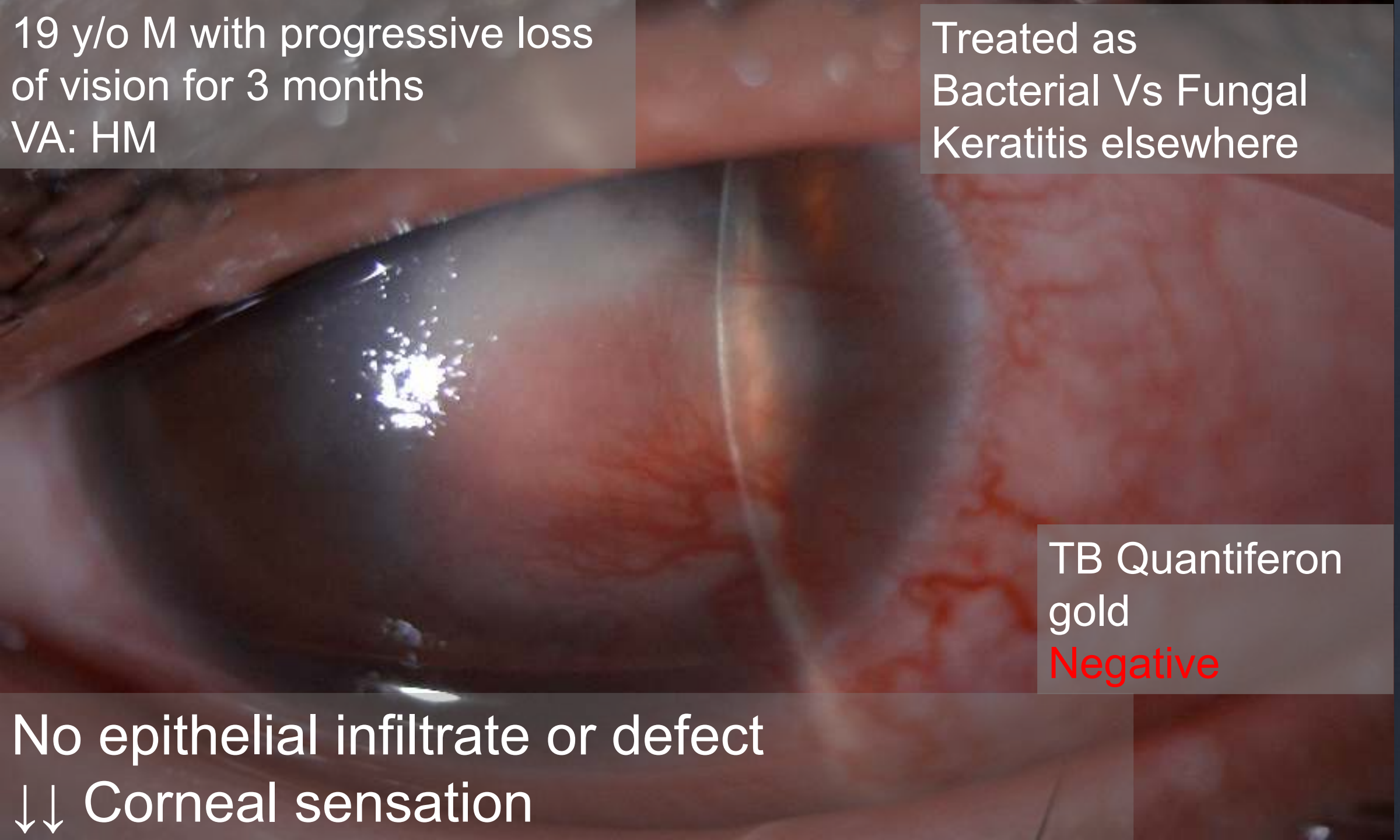
Valacyclovir
500mg 3 x day Prophylaxis : 500mg 1 x day

Topical Steroids

- Start 4 x day potent steroid, needs **slow** taper over 4-6 weeks, longer in recurre cases
- Continue low frequency and potency for months after resolution of symptoms

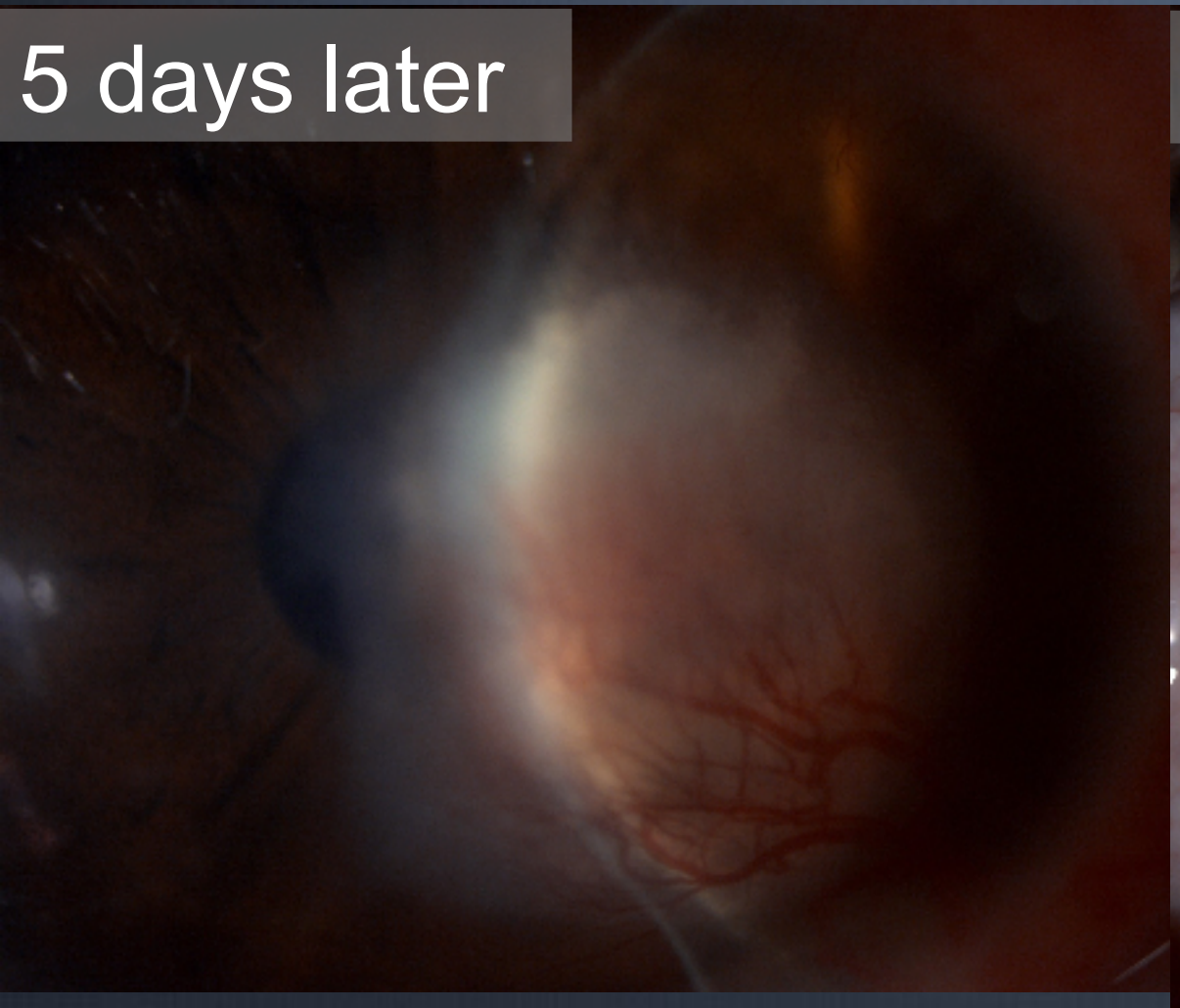





19 y/o M with progressive loss of vision for 3 months
VA: HM
Treated as Bacterial Vs Fungal Keratitis elsewhere
TB Quantiferon gold
Negative
No epithelial infiltrate or defect
↓↓ Corneal sensation

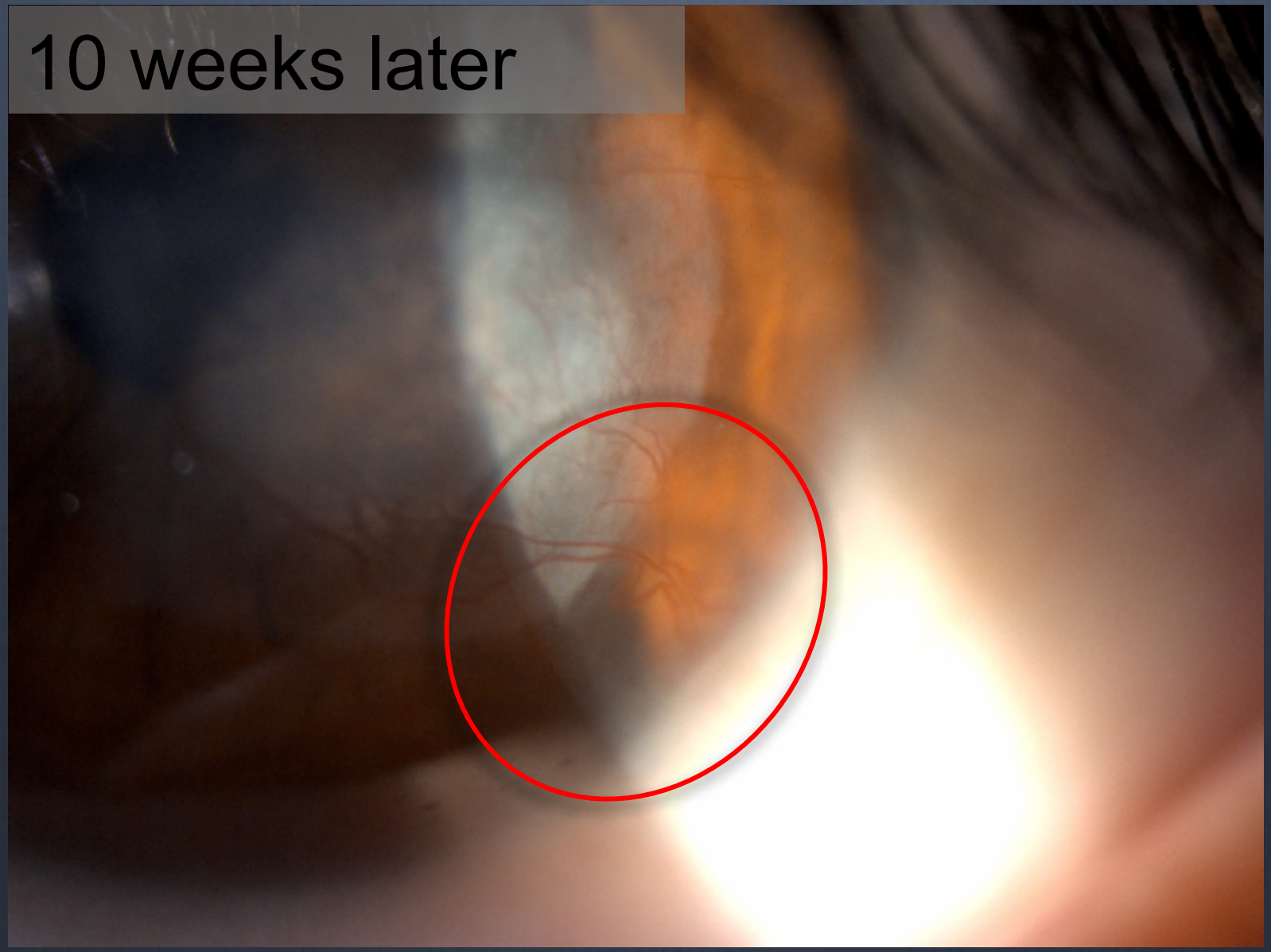
Started on systemic Acyclovir 400mg 5 x day
5 days later started on topical Prednisolone 5x day

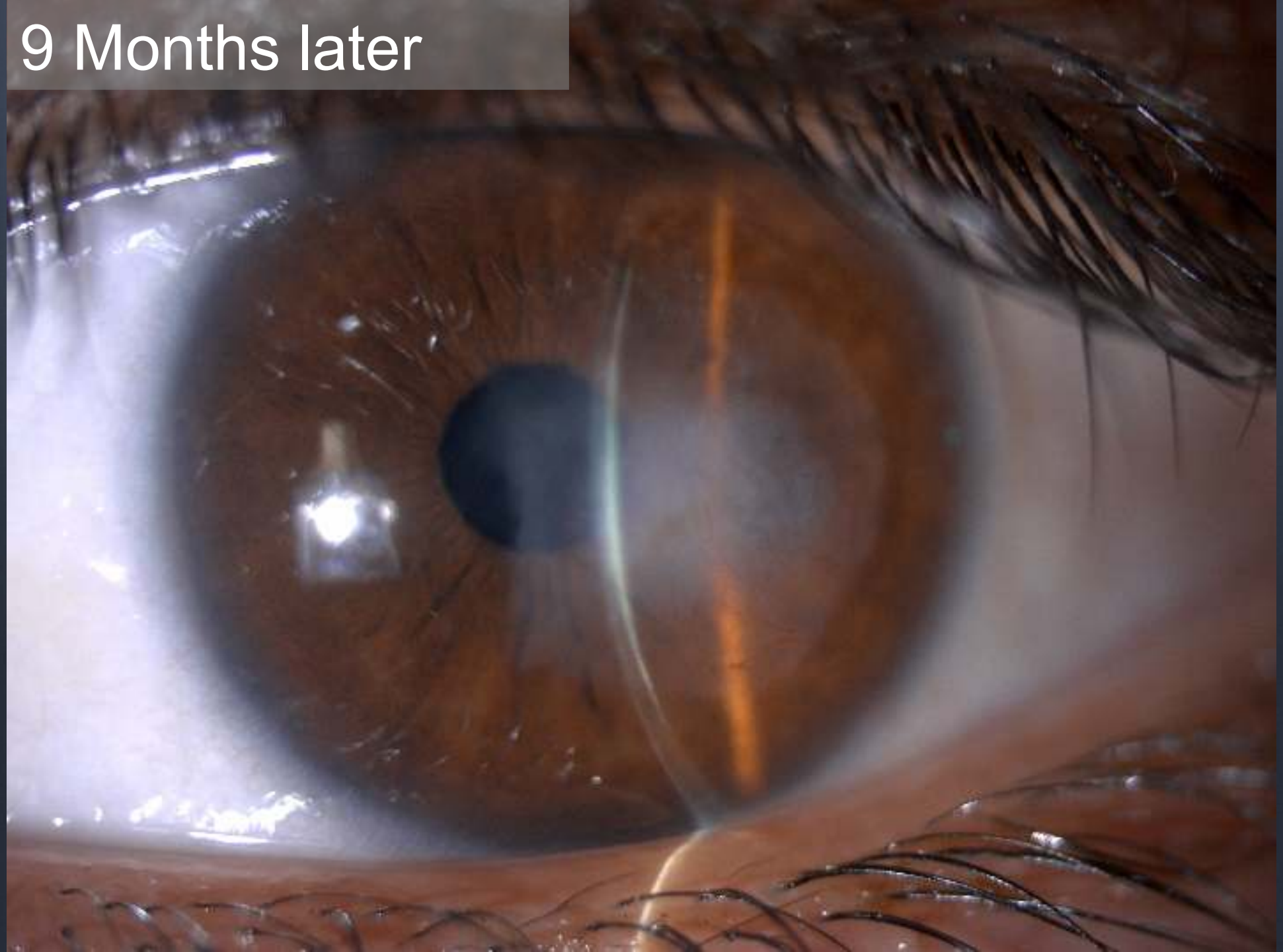
5 days later



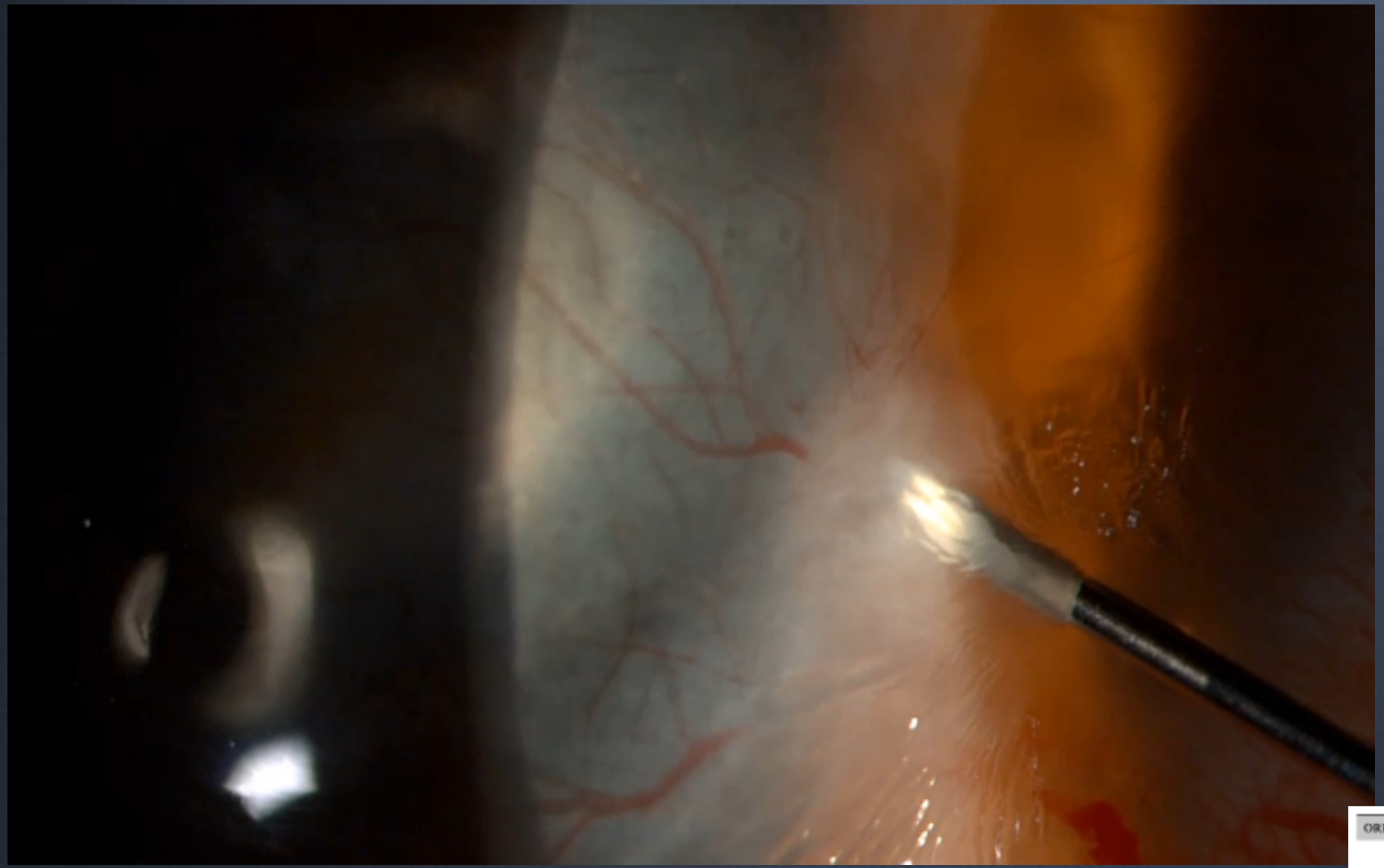
2 weeks later

Switched to Topical fluorometholone with slow taper
Acyclovir 400mg 2 x day for 3 months

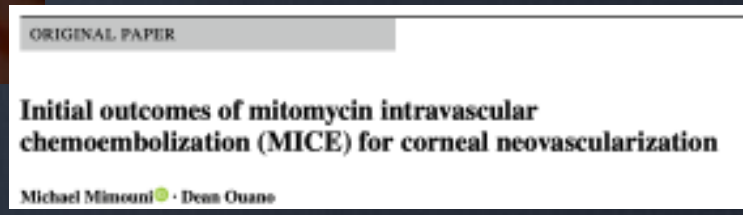



9 Months later

Mitomycin Intravascular chemoembolization (MICE)



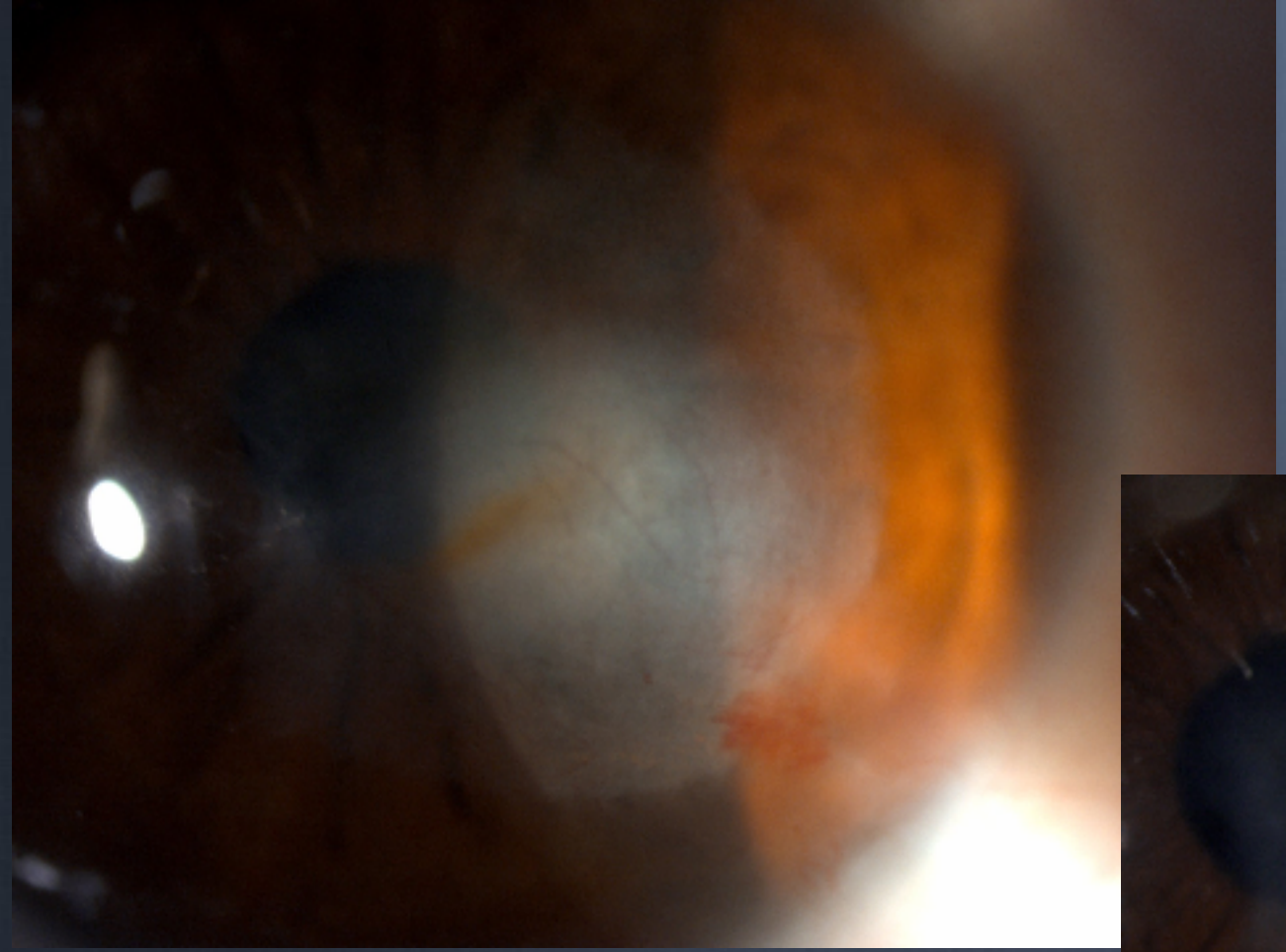
- 33 Gauge Needle attached to 1cc syringe
- MMC (0.4mg/ml)
- A small volume of MMC <0.05 ml was injected to fill vessels


ORIGINAL PAPER

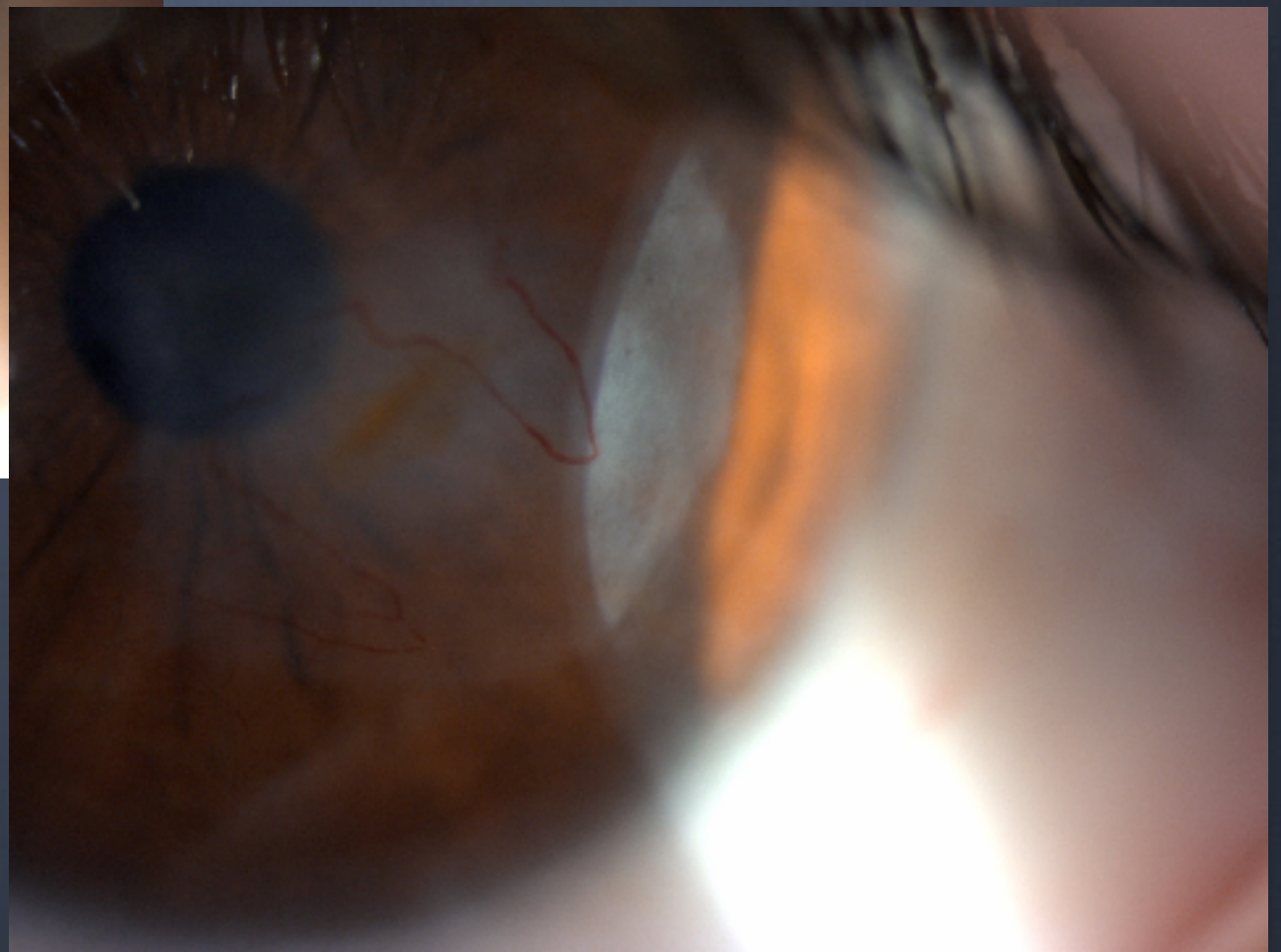
Initial outcomes of mitomycin intravascular chemoembolization (MICE) for corneal neovascularization

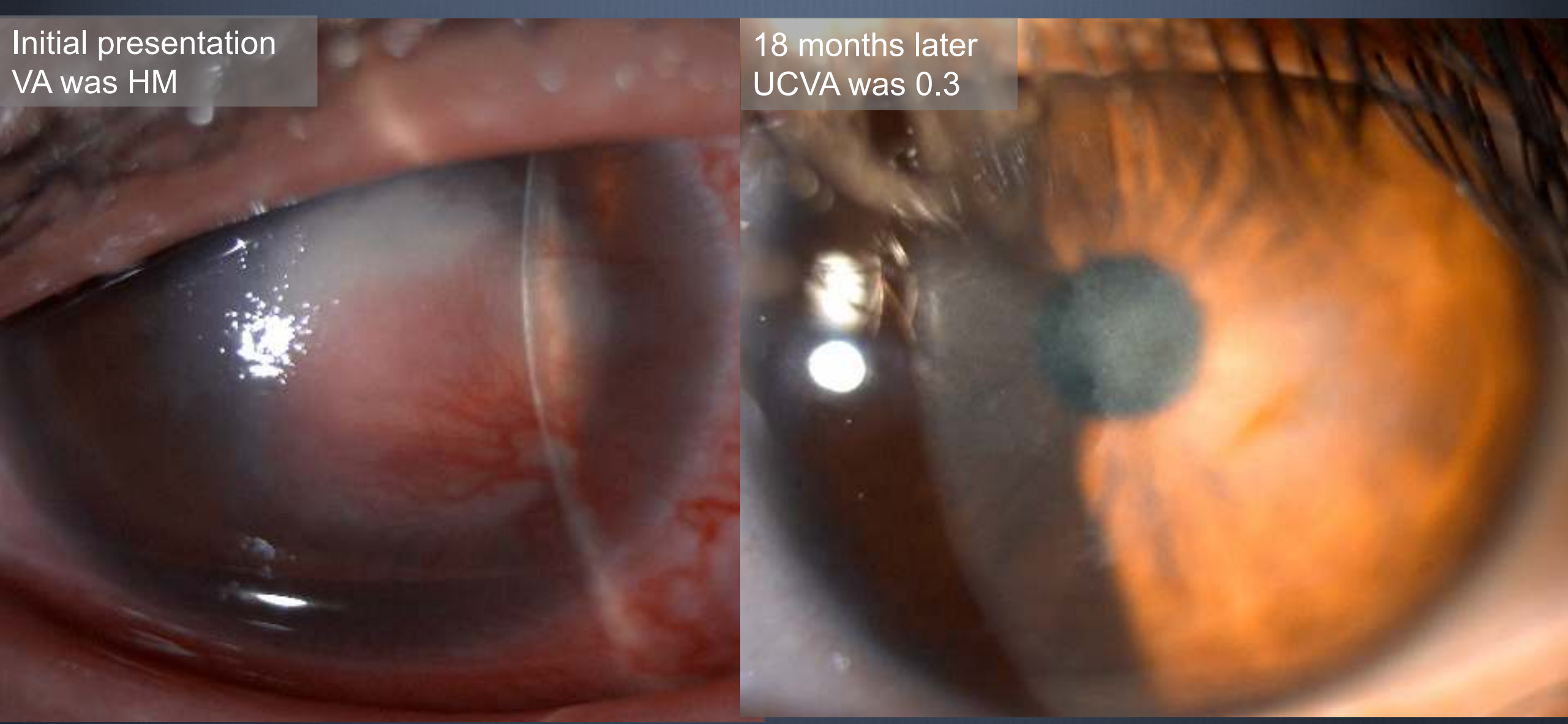
Michael Mimouni · Dean Ouano

Int Ophthalmol (2022) 42:2407–2416



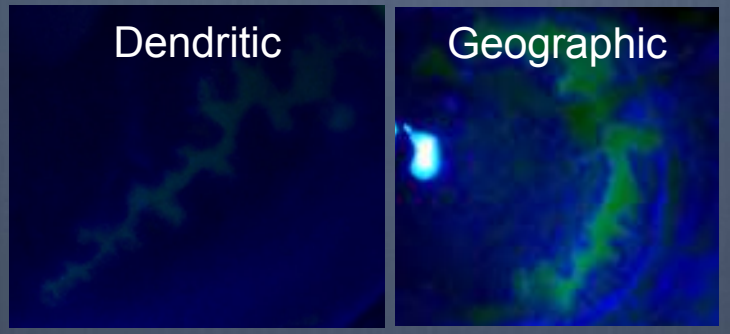
Over the next two months




Initial presentation
VA was HM
18 months later
UCVA was 0.3

Summary of HSV Keratitis Management

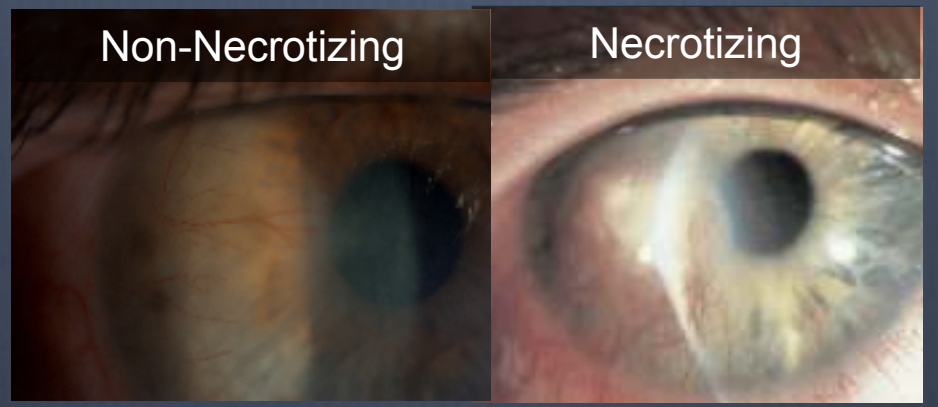
Epithelial keratitis



Debridement

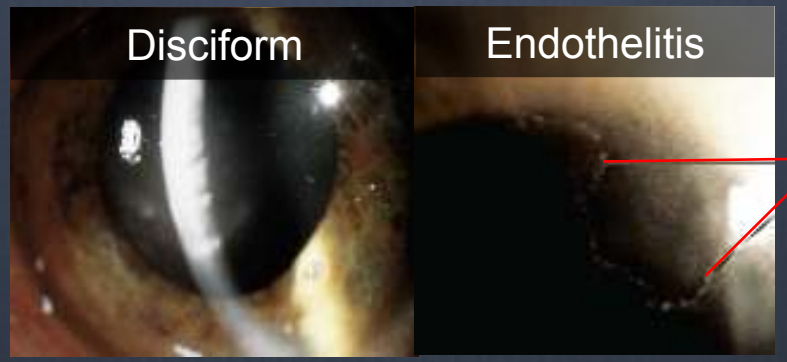
Topical or Oral Acylovir

Stromal keratitis



Oral antiviral (therapeutic dose)
+ topical steroids

Endothelial keratitis



Topical Steroid + oral antiviral prophylaxis

Vaccine development has been challenging

Educate patients regarding long term management

Thank You