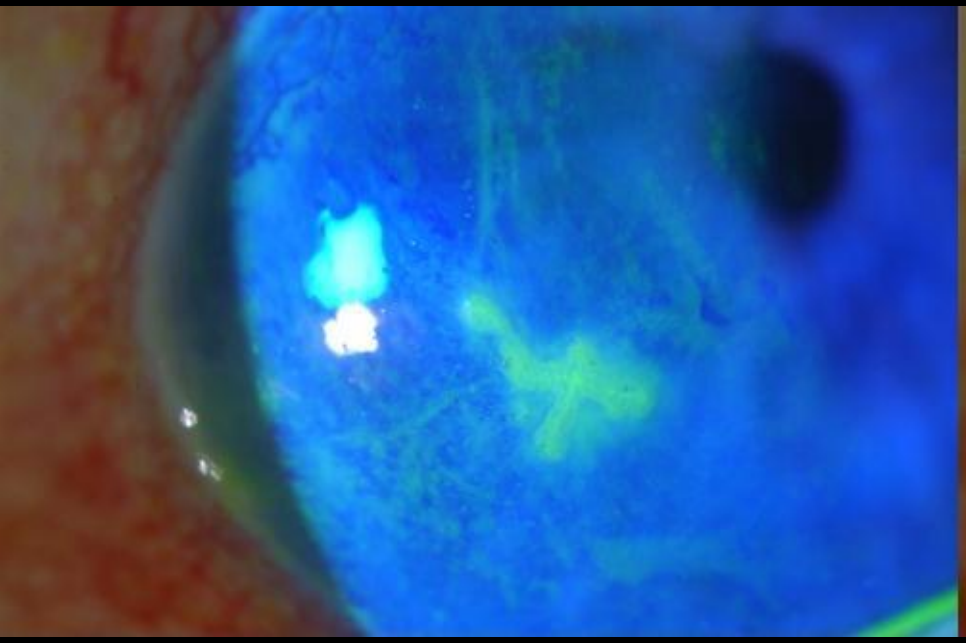
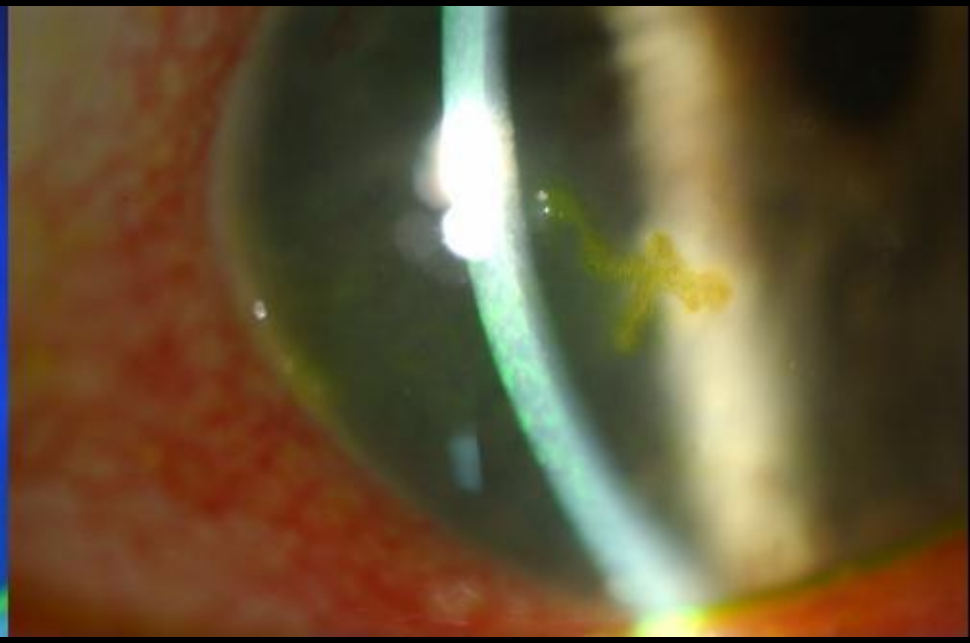
VIRAL INFECTION AND THE CORNEA

WHAT IS OLD, WHAT IS NEW, WHAT IS TRUE?

ECOVIC Nov 2019





Dr Georgia Cleary

PhD, MBBS (Hons), FRCOphth., FRANZCO

Cornea | Cataract | Refractive | General Ophthalmology

The Plan

- OLD = HSV: looking at the evidence
- NEW = HZO: waiting for evidence
  + immunisation
- TRUE = It is Adenovirus season

HSV Keratitis

HSV Keratitis

Significant morbidity

Large proportion of RVEEH cornea workload

- Inpatient admissions with secondary bacterial keratitis and corneal perforation
- ED and outpatient presentations
- $$$ cost to patients / hospital / pharmacy / PBS


You have
HERPES,
Sorry :)

HSV Keratitis

Good evidence for effective treatments

Goals of management

- Early diagnosis
- Suspect in all cases of keratitis
- Treatment targeted to the specific type of keratitis
- Prophylaxis in recurrent cases

HSV Keratitis – classification

Corneal Layer	Nomenclature	Alternate Terms
Epithelium	1. HSV epithelial keratitis	Dendritic epithelial ulcer Geographic epithelial ulcer
Stroma	2. HSV stromal keratitis without ulceration	Non-necrotizing keratitis Interstitial keratitis Immune stromal keratitis
	3. HSV stromal keratitis with ulceration	Necrotizing keratitis
Endothelium	4. HSV endothelial keratitis	Disciform keratitis

Herpes Simplex Virus Keratitis: A Treatment Guideline

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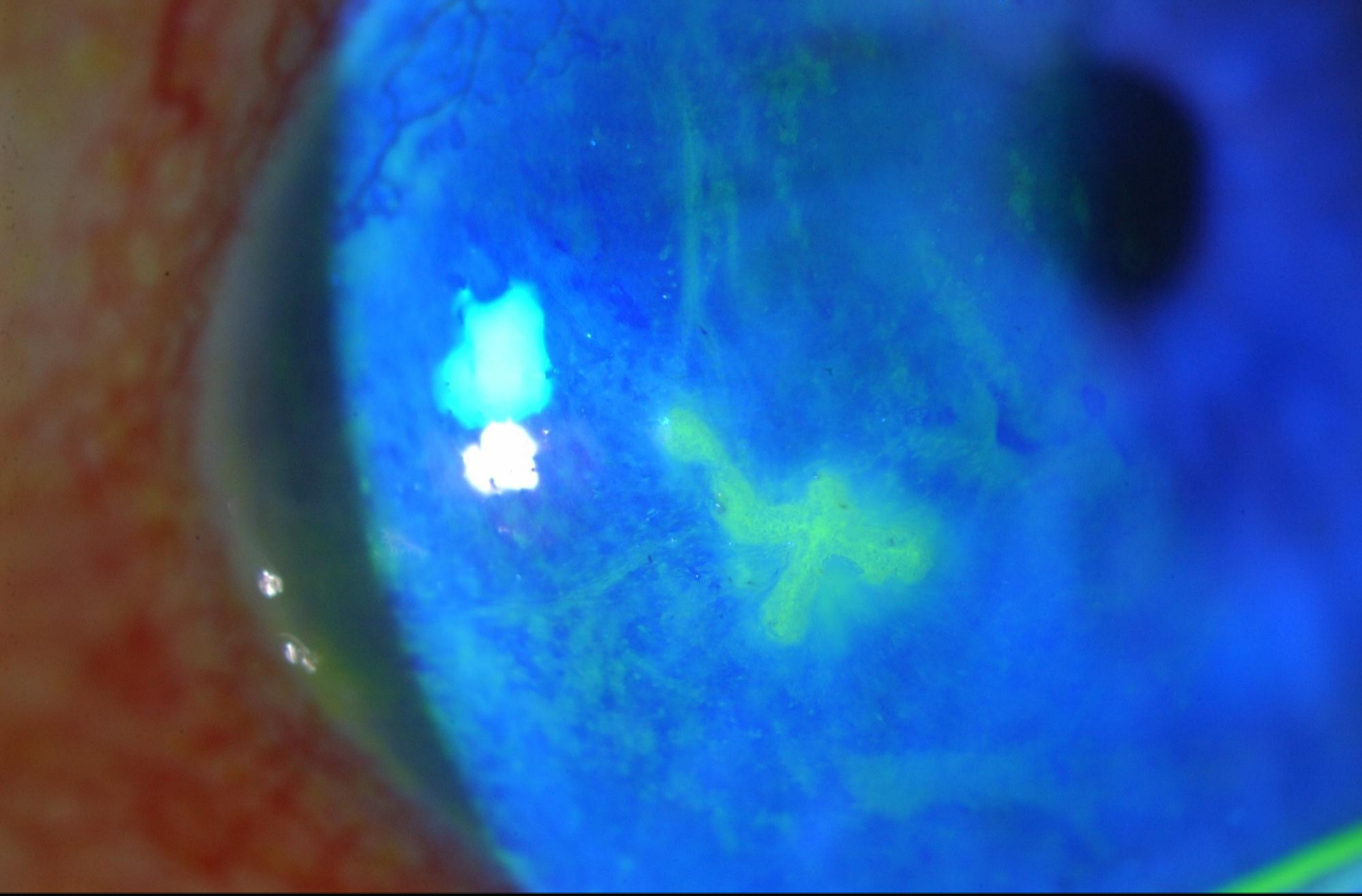
This guideline was approved by the Ocular Microbiology and Immunology Group in May 2014.

This guideline was reviewed and accepted by the Hoskins Center for Quality Eye Care, American Academy of Ophthalmology in the Compendium of Evidence-Based Eye Care™ in June 2014.

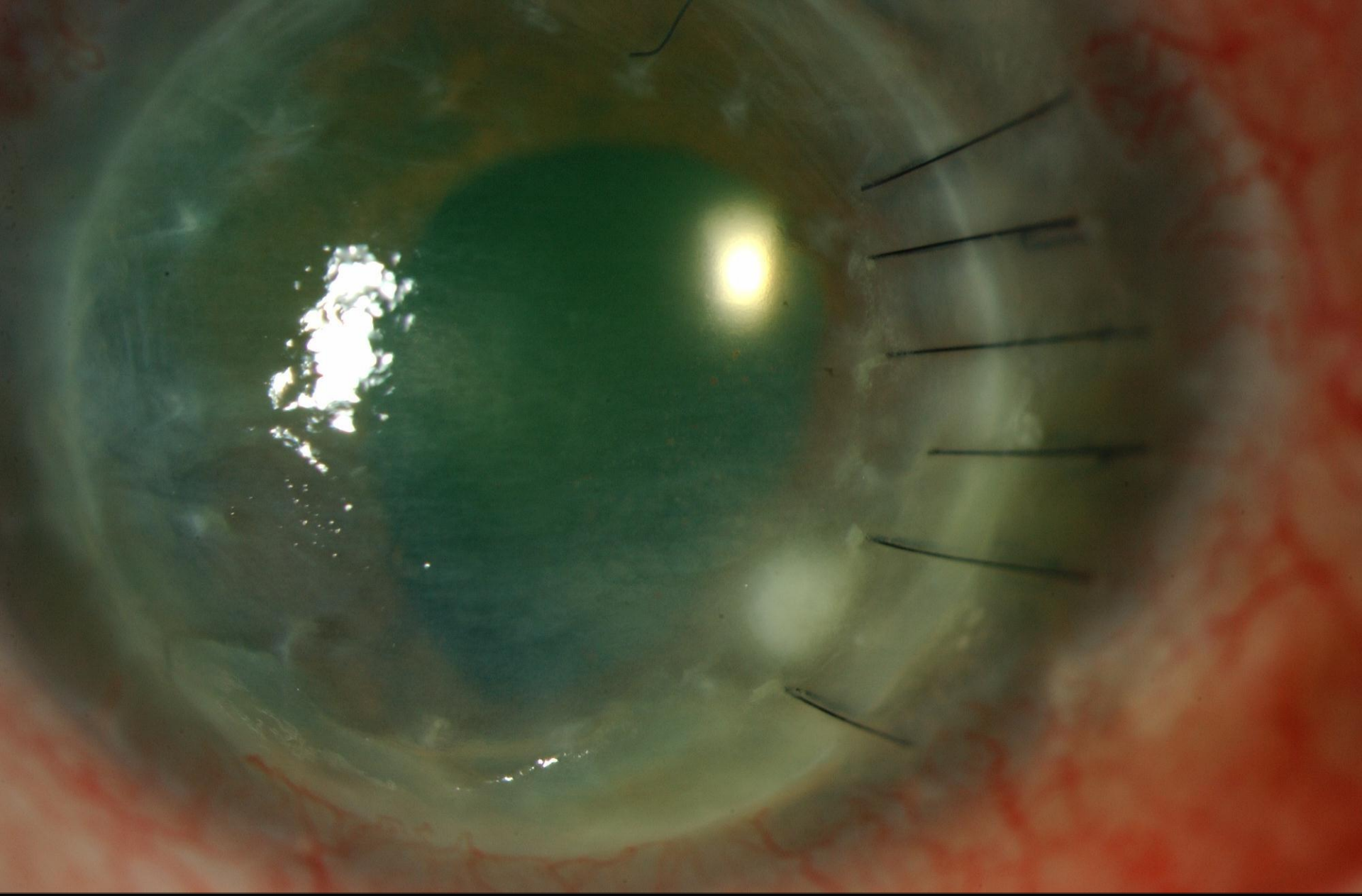
1.
HSV Epithelial Keratitis

HSV Epithelial Keratitis

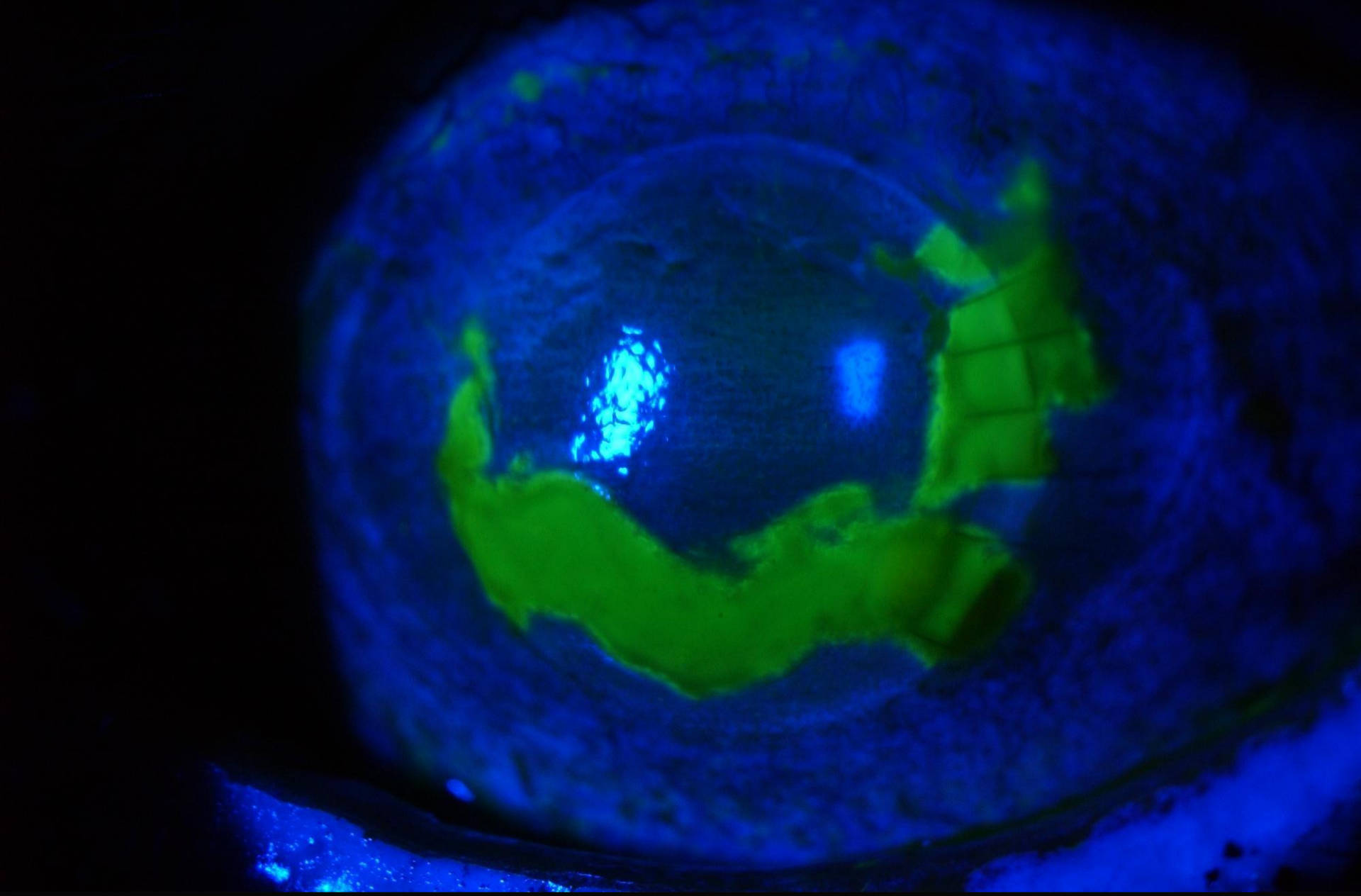
Clinical diagnosis	Dendritic ulcer - Branching - Terminal bulbs - Stains with fluorescein Geographic ulcer - Large irregular ulcer - Crosses graft – host junction in corneal grafts
Laboratory diagnosis	Viral PCR (corneal swab)
Differential diagnosis	Herpes Zoster Keratitis Healing epithelial defect Acanthamoeba keratitis
Treatment	Epithelial debridement Topical antiviral – aciclovir 3% ointment 5 x daily 14 days Valaciclovir 500mg TID for 7 days



HSV epithelial keratitis



HSV epithelial keratitis + microbial keratitis on PK



HSV epithelial keratitis + microbial keratitis on PK

Published in final edited form as:

Cochrane Database Syst Rev. ; 1: CD002898.

Antiviral treatment and other therapeutic interventions for herpes simplex virus epithelial keratitis

Kirk R Wilhelmus[1]

[1]Cullen Eye Institute, Department of Ophthalmology, Baylor College of Medicine, Houston, Texas, USA

Abstract

Background—Eye disease due to herpes simplex virus (HSV) commonly presents as epithelial keratitis which, though usually self-limiting, may persist or progress without treatment.

Objectives—To compare the relative effectiveness of antiviral agents, interferon, and corneal debridement in the treatment of HSV epithelial keratitis.

Search methods—We searched CENTRAL (which contains the Cochrane Eyes and Vision Group Trials Register) (2014, Issue 12), PubMed (January 1946 to 31 December 2014), EMBASE (January 1980 to 31 December 2014), Latin American and Caribbean Health Sciences Literature Database (LILACS) (January 1982 to 31 December 2014), System for Information on Grey

Antiviral treatment and other therapeutic interventions for HSV epithelial keratitis

Kirk R Wilhelmus

Cochrane Database Syst Rev.; 1:CD002898

Placebo controlled studies	Idoxuridine Vidarabine IFN All better than placebo SUPERSEDED
Comparative studies	Aciclovir and Trifluridine better than Idoxuridine
	Aciclovir and Trifluridine better than Vidarabine
	Aciclovir = Trifluridine
	Ganciclovir = Aciclovir

137 studies, 8333 eyes

CONCLUSIONS

- Topical antivirals are effective in the treatment of HSV epithelial keratitis
- Older antiviral better than placebo
- Newer antivirals better than older antivirals

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IMPORTANT INFORMATION FOR HEALTHCARE PROFESSIONALS

1st December 2018

Dear Healthcare Professional,

Notification of discontinuation of Zovirax (Aciclovir) Eye Ointment (3% w/w)

INDICATIONS: Zovirax Eye Ointment is an antiviral ointment indicated for the treatment of herpes simplex keratitis

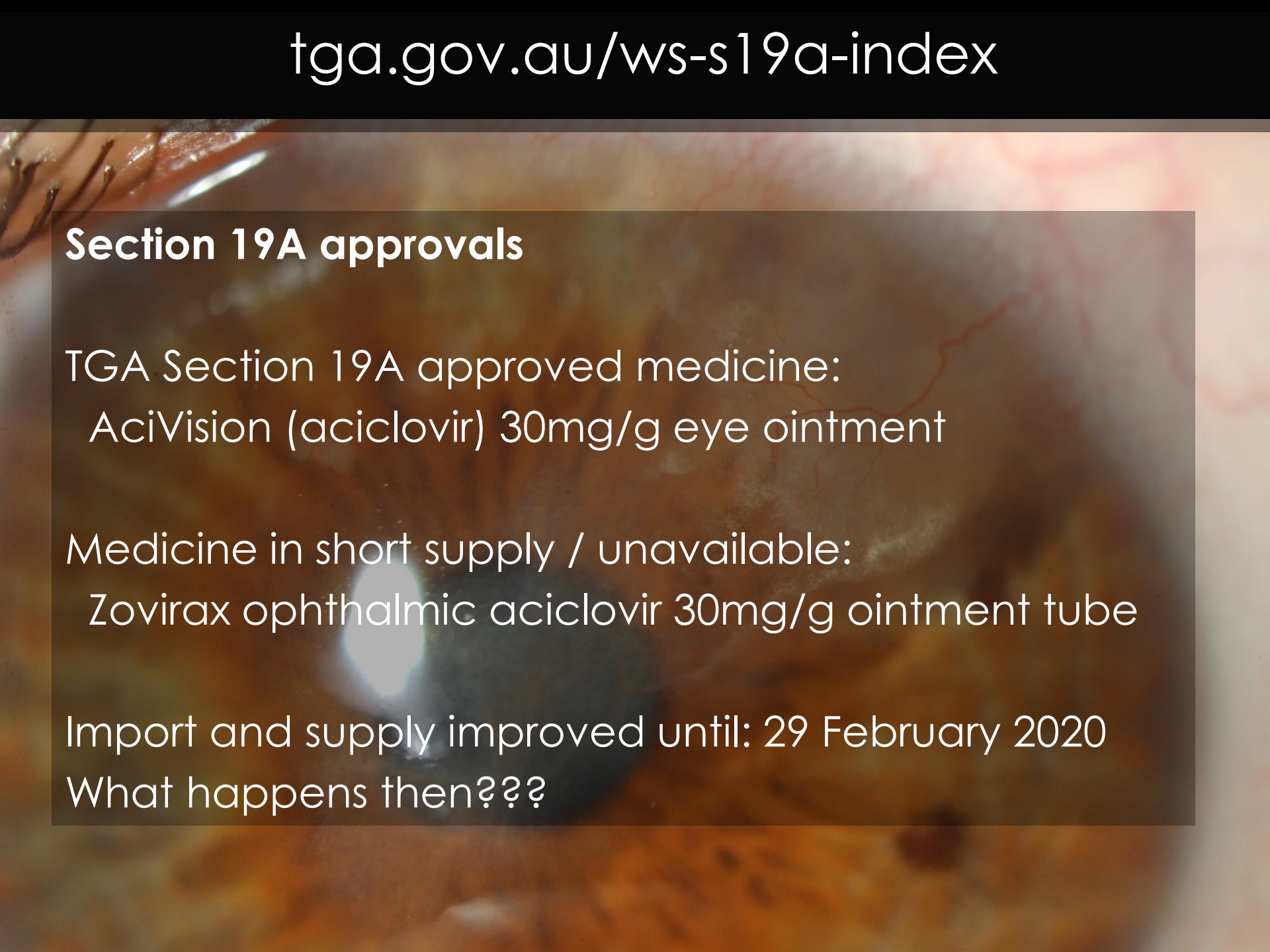
- GSK will cease the manufacture and supply of Zovirax Eye Ointment globally during 2018 due to repeated challenges in guaranteeing a sustainable product supply. GSK regrets that it has no alternative but to discontinue this product.

HSV epithelial keratitis

Alternatives to Zovirax™

- Aciclovir 3% ointment – AciVision brand
  - Section 19A approved medication
  - Discounted PBS price $39.30
- Ganciclovir 0.15% gel (Virgan®)
  - SAS approval
  - 5 times daily
- Trifluridine 1% drops (Virophta)
  - SAS approval
  - 5 – 10 times daily

tga.gov.au/ws-s19a-index



Section 19A approvals

TGA Section 19A approved medicine:
AciVision (aciclovir) 30mg/g eye ointment

Medicine in short supply / unavailable:
Zovirax ophthalmic aciclovir 30mg/g ointment tube

Import and supply improved until: 29 February 2020
What happens then???

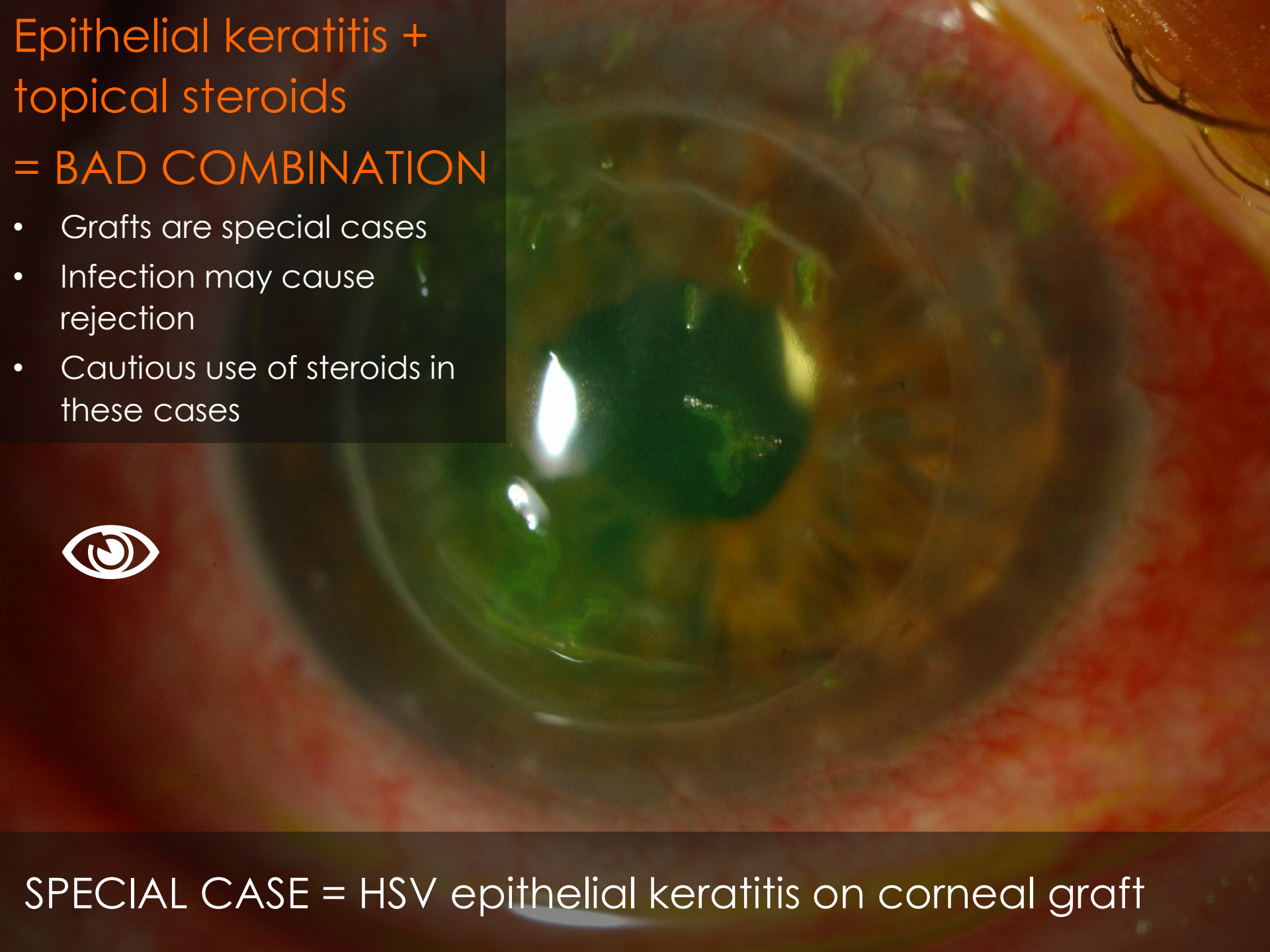
HEDS II
HSV epithelial keratitis trial

- Role of oral aciclovir in the early treatment of epithelial HSV –

  Does it prevent progression to stromal keratitis and iridocyclitis?

  - All patients received topical antiviral (trifluridine)
  - Randomised to oral aciclovir or placebo
  - 1 year

- Conclusion = No additional benefit from oral aciclovir

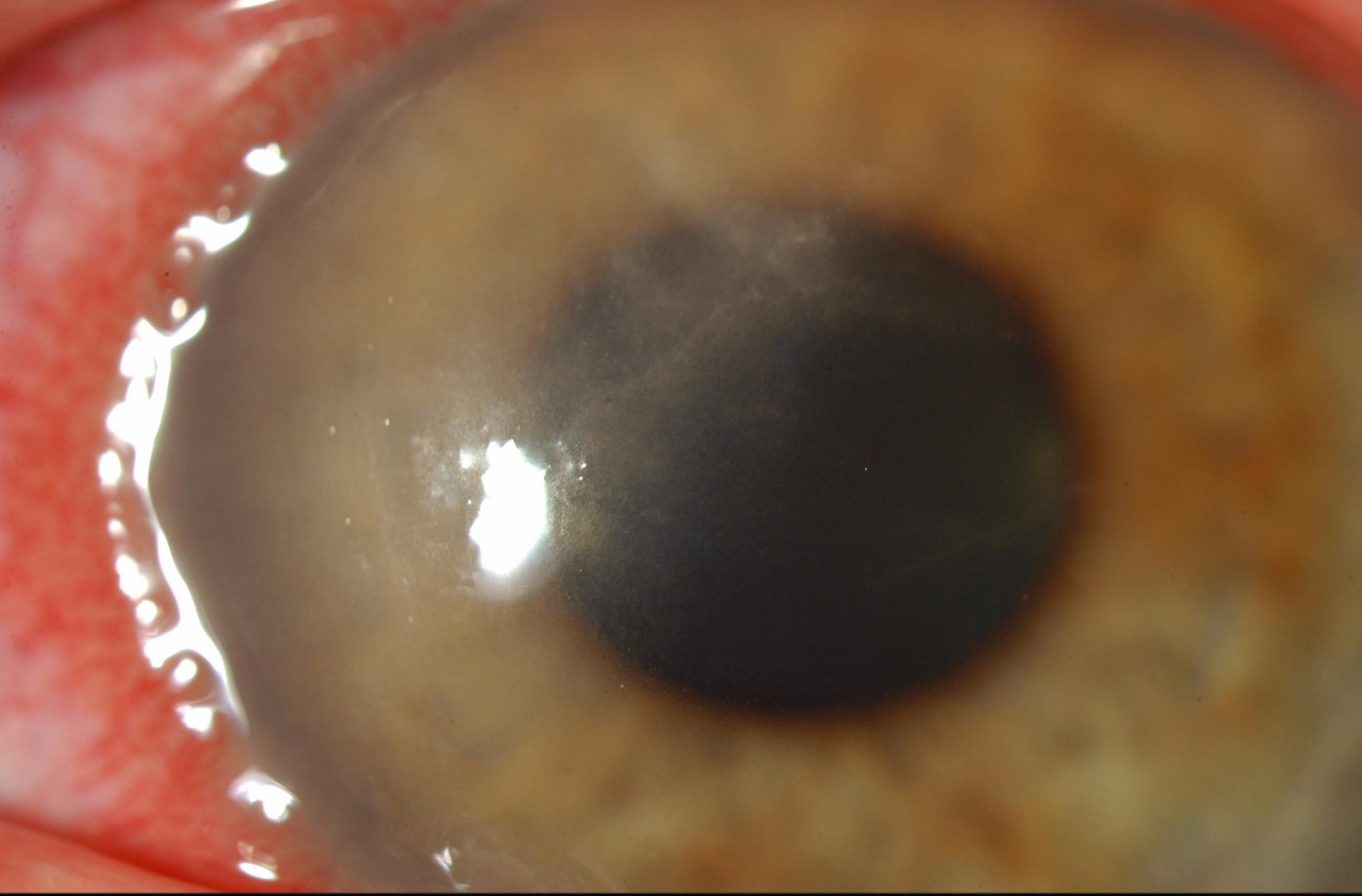


Epithelial keratitis + topical steroids = BAD COMBINATION

- Grafts are special cases
- Infection may cause rejection
- Cautious use of steroids in these cases

SPECIAL CASE = HSV epithelial keratitis on corneal graft

DIFFERENTIAL DIAGNOSIS: acanthamoba keratitis



DIFFERENTIAL DIAGNOSIS: acanthamoba keratitis

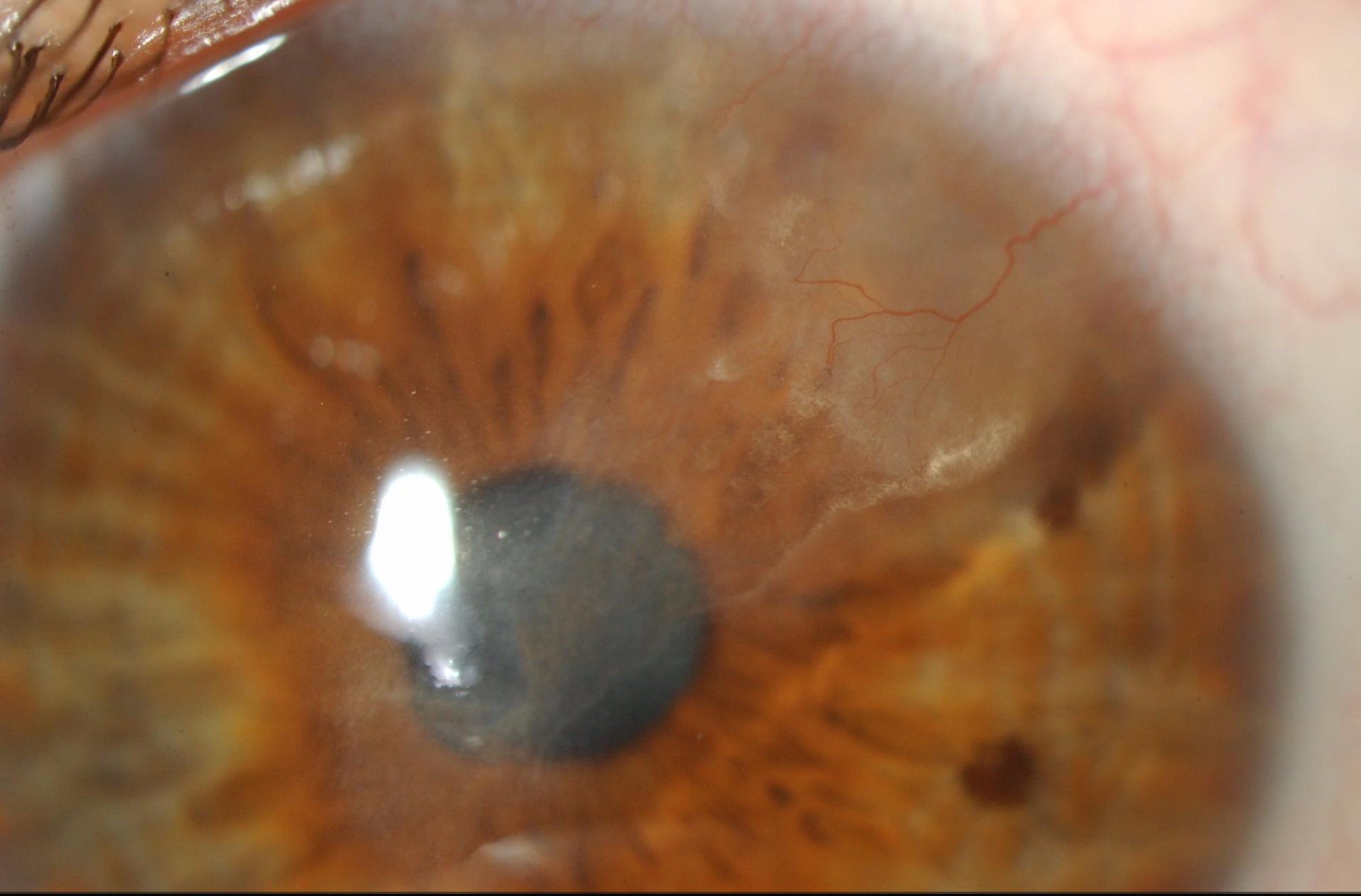
DIFFERENTIAL DIAGNOSIS: healing abrasion

DIFFERENTIAL DIAGNOSIS: healing abrasion

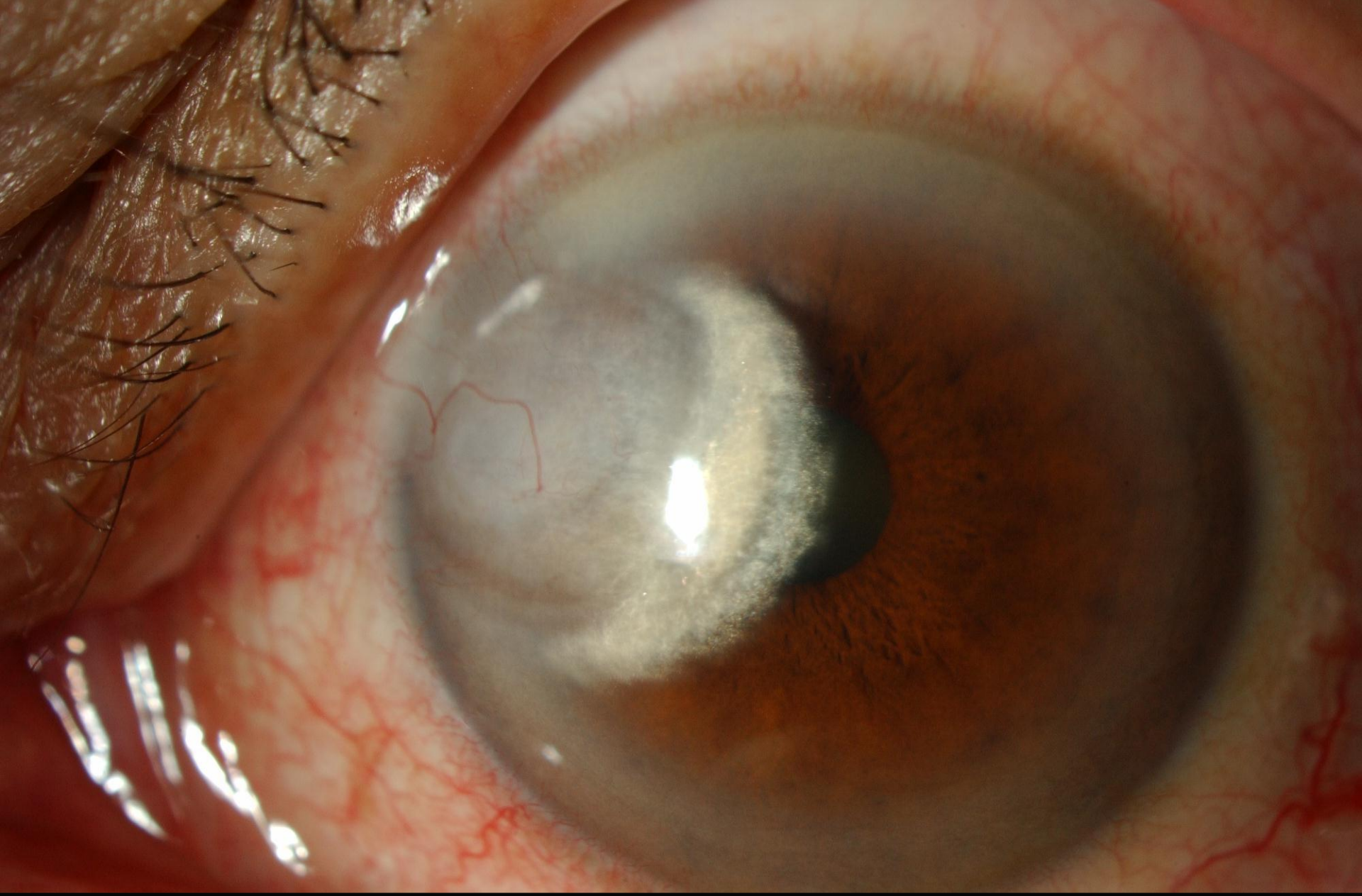
2.
HSV Stromal Keratitis without Ulceration

HSV Stromal Keratitis without Ulceration

Clinical diagnosis	+/- Reduced corneal sensation Focal, multifocal or diffuse stromal opacities +/- mild anterior chamber reaction No epithelial defect Called interstitial keratitis if accompanied by deep corneal vessels. May have lipid deposition
Laboratory diagnosis	Viral PCR of limited value – likely to be negative
Differential diagnosis	Any cause of interstitial keratitis HSV by far the most common cause Zoster keratitis Syphilis, Cogan's syndrome, EBV, measles, mumps, etc…
Treatment	Oral Valaciclovir 500mg 3 x daily for 1 week then once daily g. Prednefrin Forte 4-6 times daily start immediately



HSV stromal keratitis without ulceration



HSV stromal keratitis without ulceration

HEDS I

Herpes Stromal Keratitis – Not on Steroid Trial

- Role of topical steroid in HSV stromal keratitis (no steroid for > 10 days) –

  Is topical steroid efficacious?

  - All patients received topical antiviral (trifluridine)
  - Randomised to topical prednisolone or placebo
  - 6 months follow-up

- Conclusion = Clear benefit of topical steroid in stromal keratitis.

  Study terminated early.

  ** Also: delaying steroid did not affect the eventual visual outcome

HEDS I

Herpes Stromal Keratitis – on Steroid Treatment

- Role of oral aciclovir in the treatment of stromal keratitis in patients already taking topical steroids – is oral antiviral efficacious?
  - All patients received topical antiviral
  - Randomised to Oral ACV or placebo
  - 10 weeks of ACV (400mg 5 times daily)
  - 6 months
- Findings = No benefit from oral ACV in patients on topical antiviral and steroid

BUT! Toxicity concerns with prolonged topical antiviral

HEDS II
Acyclovir prevention trial

- Role of oral aciclovir in patients with recent HSK, but no active disease – does it prevent progression to stromal keratitis and iridocyclitis?.
  - Randomised to Oral ACV (400mg BD) or placebo
  - 1 year of ACV + further 6 months
- Findings = 41% reduction in any HSK, and 50% reduction in stromal keratitis

Aciclovir vs Valaciclovir

HEDS evaluated aciclovir

- Valaciclovir is a prodrug of aciclovir
- Comparable efficacy in preventing recurrence of HSV eye disease

Advantages of valaciclovir

- Much better bioavailability
- Less frequent dosing

Prices have fallen, now $18.39 for 30 tablets

Efficacy of Valacyclovir vs Acyclovir for the Prevention of Recurrent Herpes Simplex Virus Eye Disease: A Pilot Study

ELISABETTA MISEROCCHI, GIULIO MODORATI, LAURA GALLI, AND PAOLO RAMA

• PURPOSE: **To compare the efficacy of one-year treatment with valacyclovir vs acyclovir in preventing recurrence of the herpes simplex virus (HSV) eye disease.**
• DESIGN: **Prospective, randomized, clinical trial pilot study.**
• METHODS: **Fifty-two immunocompetent patients with a history of recurrent ocular HSV disease were treated at the Ocular Immunology Service, San Raffaele Hospital, Milan, Italy. Twenty-six patients were randomized to the valacyclovir group (one 500 mg tablet daily), and 26 patients were randomized to the acyclovir group (one 400 mg tablet twice daily). The recurrence rate of ocular HSV disease during 12 months of treatment and drug-related side effects were monitored.**
• RESULTS: **Recurrence of any type of ocular HSV disease during the 12-month treatment period was 23.1% in the valacyclovir group, compared with 23.1% in the acyclovir group. No difference between the two groups was observed regarding the nature, frequency, or severity of adverse events. The most frequent adverse events were nausea and headache.**
• CONCLUSIONS: **One-year suppression therapy with oral valacyclovir (500 mg tablet daily) was shown to be as**

person-years, 13.2 per 100,000 person-years for new cases, and 18.3 per 100,000 person-years for recurrences.[3]

Despite the availability of antiviral agents that are effective in treating HSV eye disease, visual impairment resulting from corneal scarring and uncontrolled intraocular inflammation can occur in many patients. The most important and challenging problem in patients with recurrent ocular HSV is to limit and suppress recurrences to avoid permanent visual loss. An analysis of the natural history of ocular herpes simplex infection shows that the number of recurrent episodes increases after onset: 9.6% at one year, 22.9% at two years, and 63.2% at 20 years.[1,4]

Acyclovir is an antiviral drug that selectively targets virus-infected cells and has been shown to be effective in treating and preventing genital herpes[5–7] and orofacial herpes.[8] It also has been evaluated in the therapy and prophylaxis of HSV eye disease in a series of clinical trials known as the Herpetic Eye Disease Study (HEDS).[9,10] The HEDS recently showed that long-term prophylactic treatment with oral acyclovir for more than 12 months reduces ocular HSV recurrence.[11]

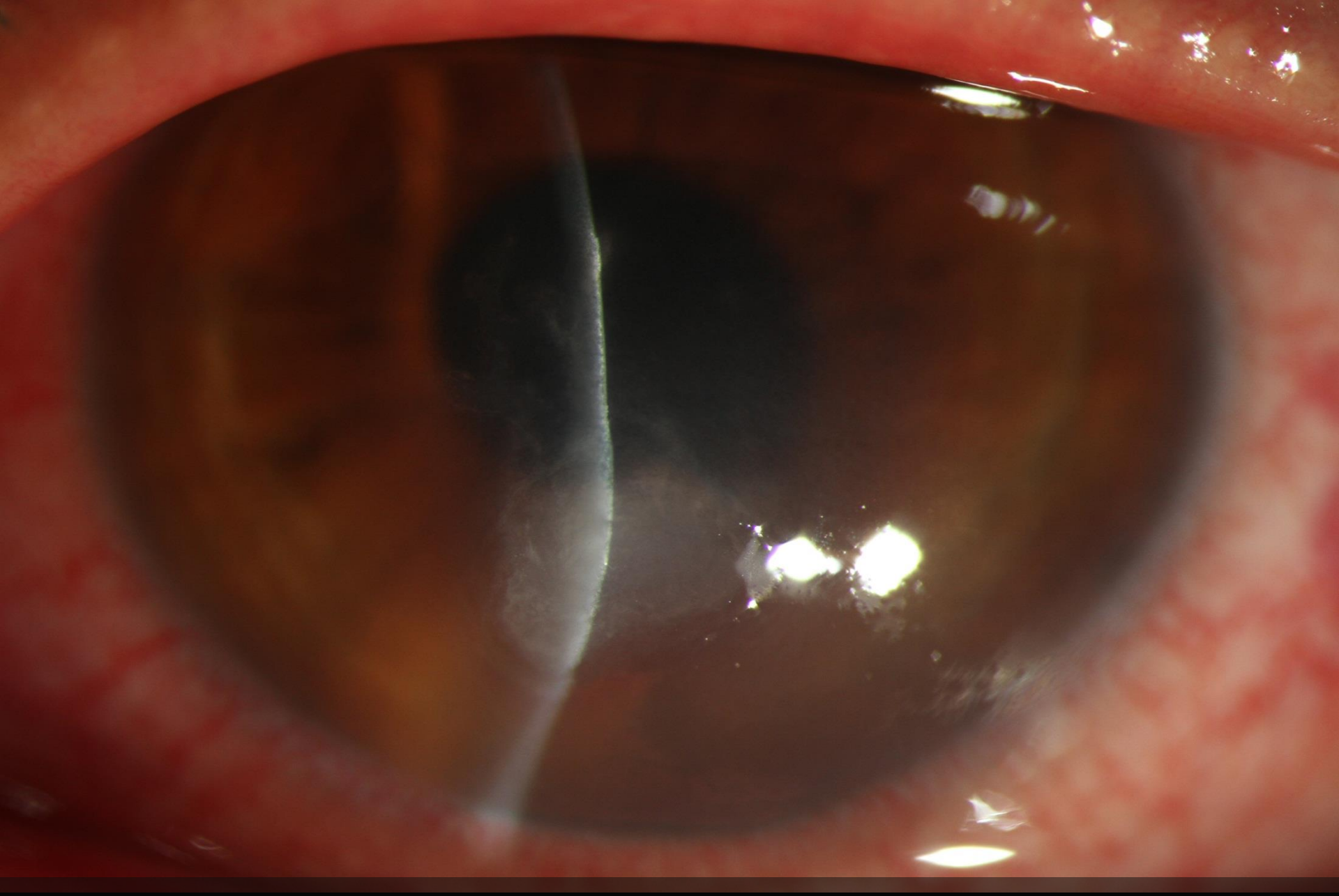
Valacyclovir is the prodrug of acyclovir and is converted rapidly to acyclovir after oral administration. The resulting

3.
HSV Stromal Keratitis with Ulceration

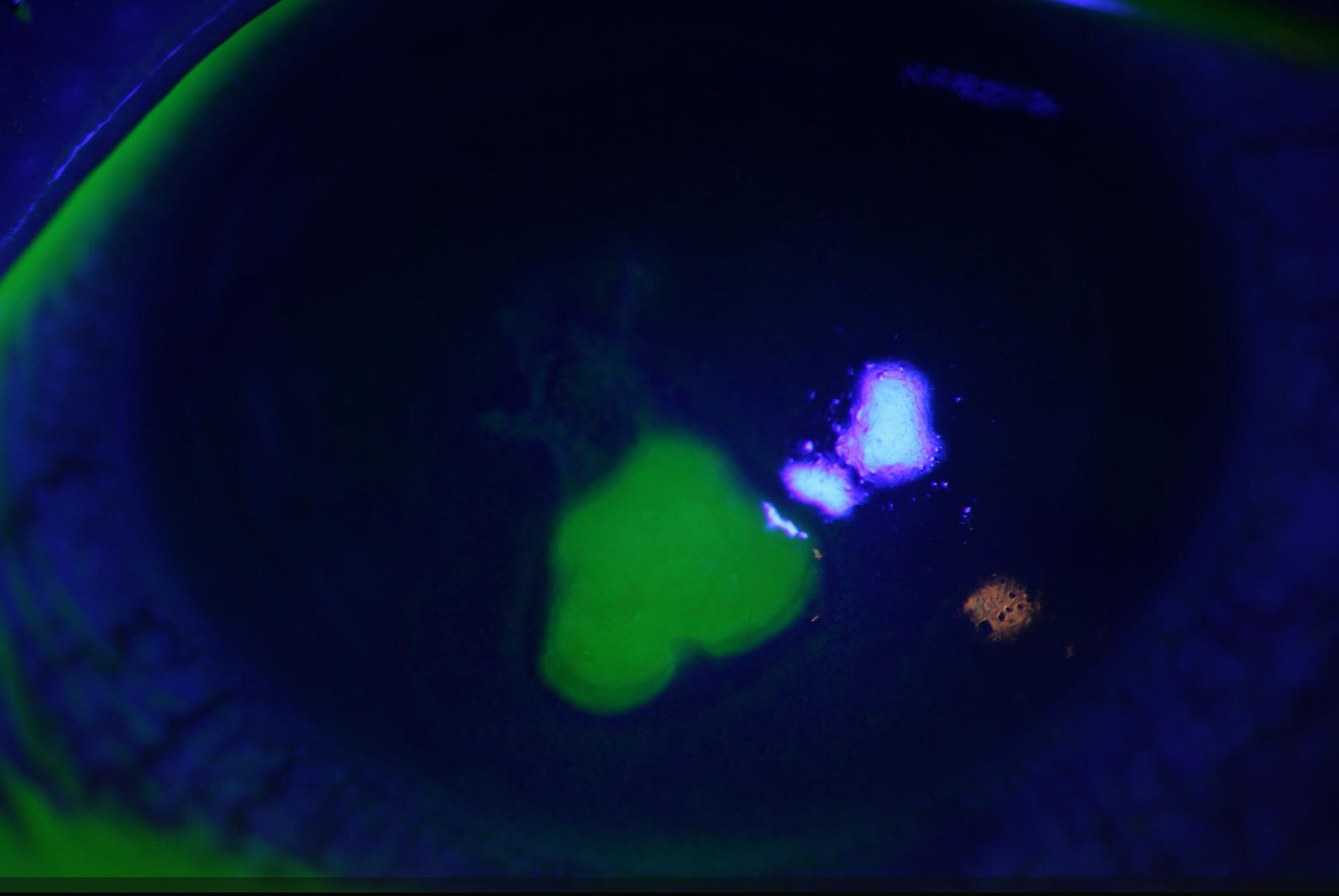
HSV Stromal Keratitis with Ulceration

Clinical diagnosis	+/- Reduced corneal sensation Corneal opacity in the presence of an epithelial defect and stromal thinning May lead to corneal perforation Frequently associated anterior chamber inflammation Signs of co-existing microbial keratitis – difficult to distinguish viral from bacterial keratitis
Laboratory diagnosis	Viral PCR (corneal swab) Corneal scrape for co-existing microbial keratitis
Differential diagnosis	All forms of microbial keratitis (bacterial, fungal, amoebal) Zoster keratitis Sterile keratolysis from chemical injuries and autoimmune disease Exposure and neurotrophic keratopathy
Treatment	Oral Valaciclovir 500mg 3 x daily for 1 week then once daily g. Prednefrin Forte 4-6 times daily when epithelium healed or improving, +/- microbial keratitis improving

HSV stromal keratitis with ulceration



HSV stromal keratitis with ulceration

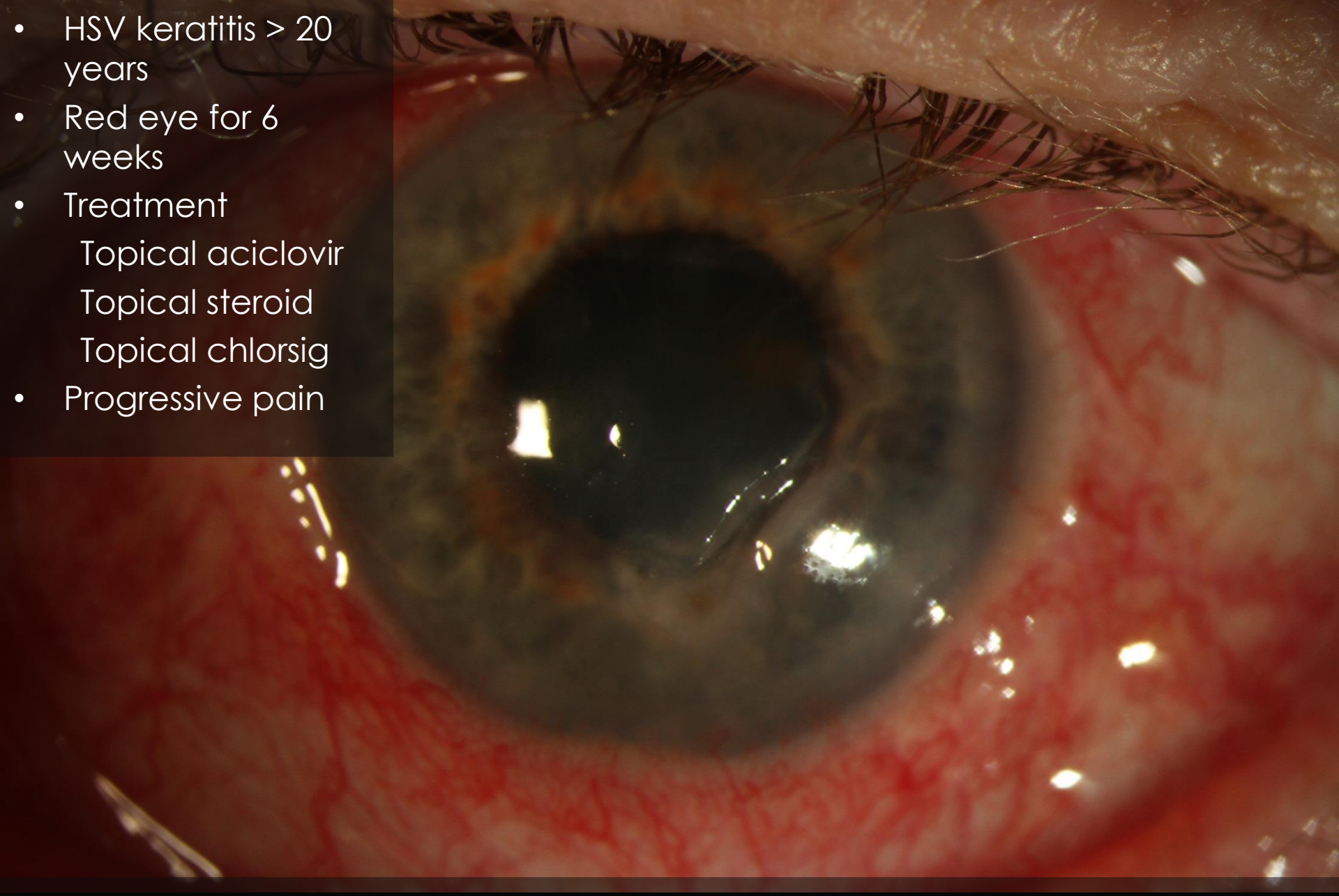


HSV stromal keratitis with ulceration

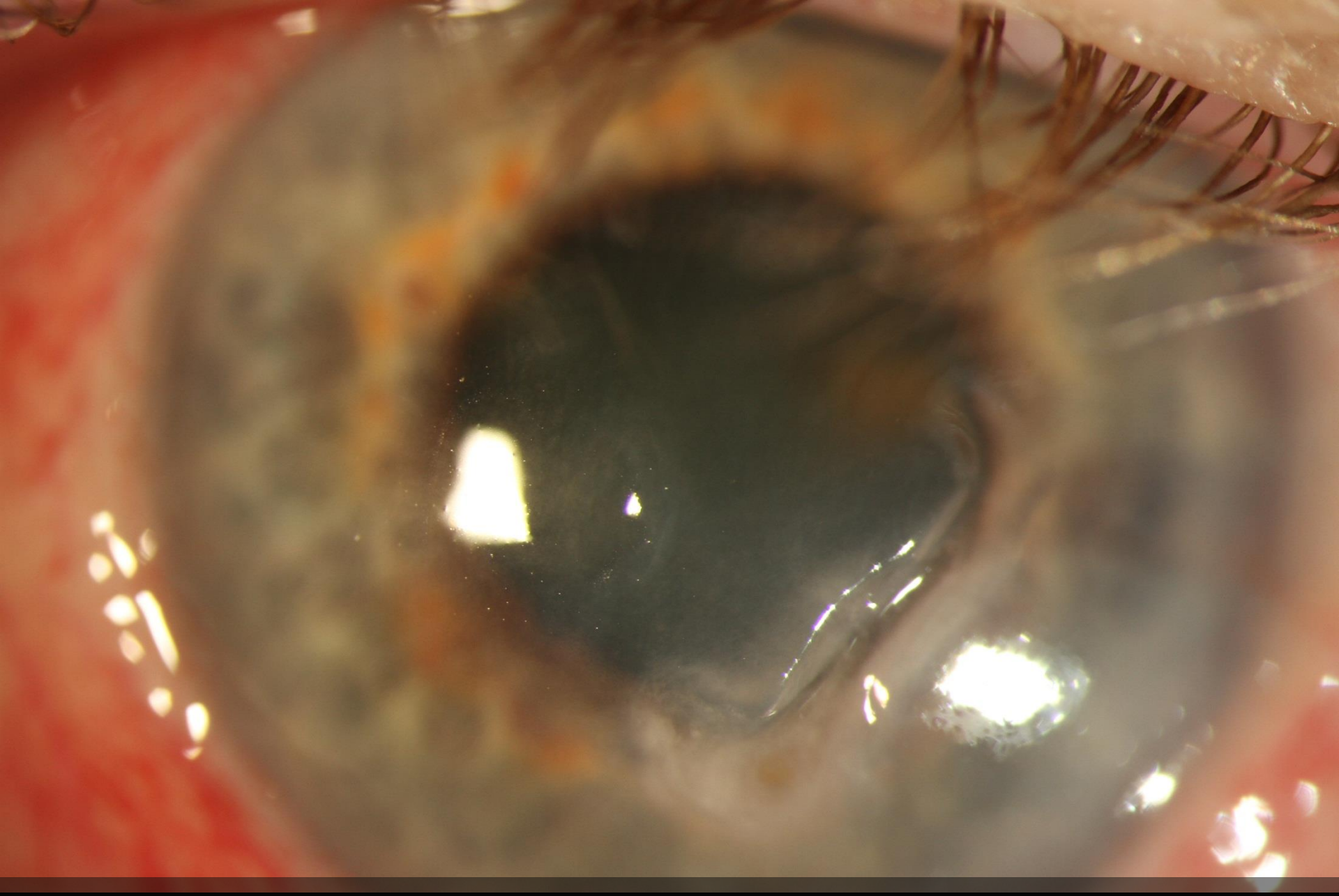
HSV stromal keratitis with ulceration: atopic disease

HSV stromal keratitis with ulceration

- HSV keratitis > 20 years
- Red eye for 6 weeks
- Treatment
  - Topical aciclovir
  - Topical steroid
  - Topical chlorsig
- Progressive pain



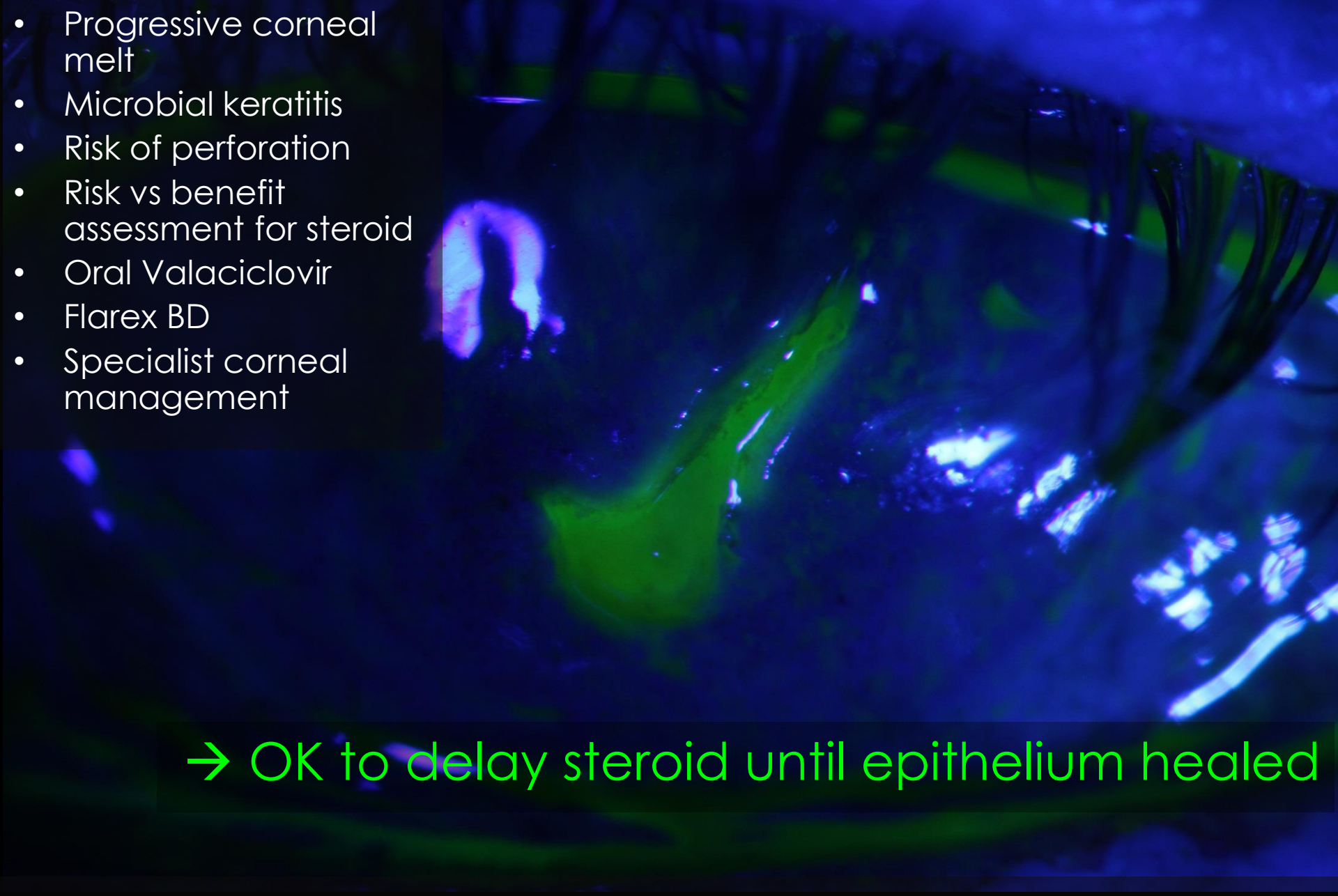
HSV stromal keratitis with ulceration



HSV stromal keratitis with ulceration

HSV stromal keratitis with ulceration

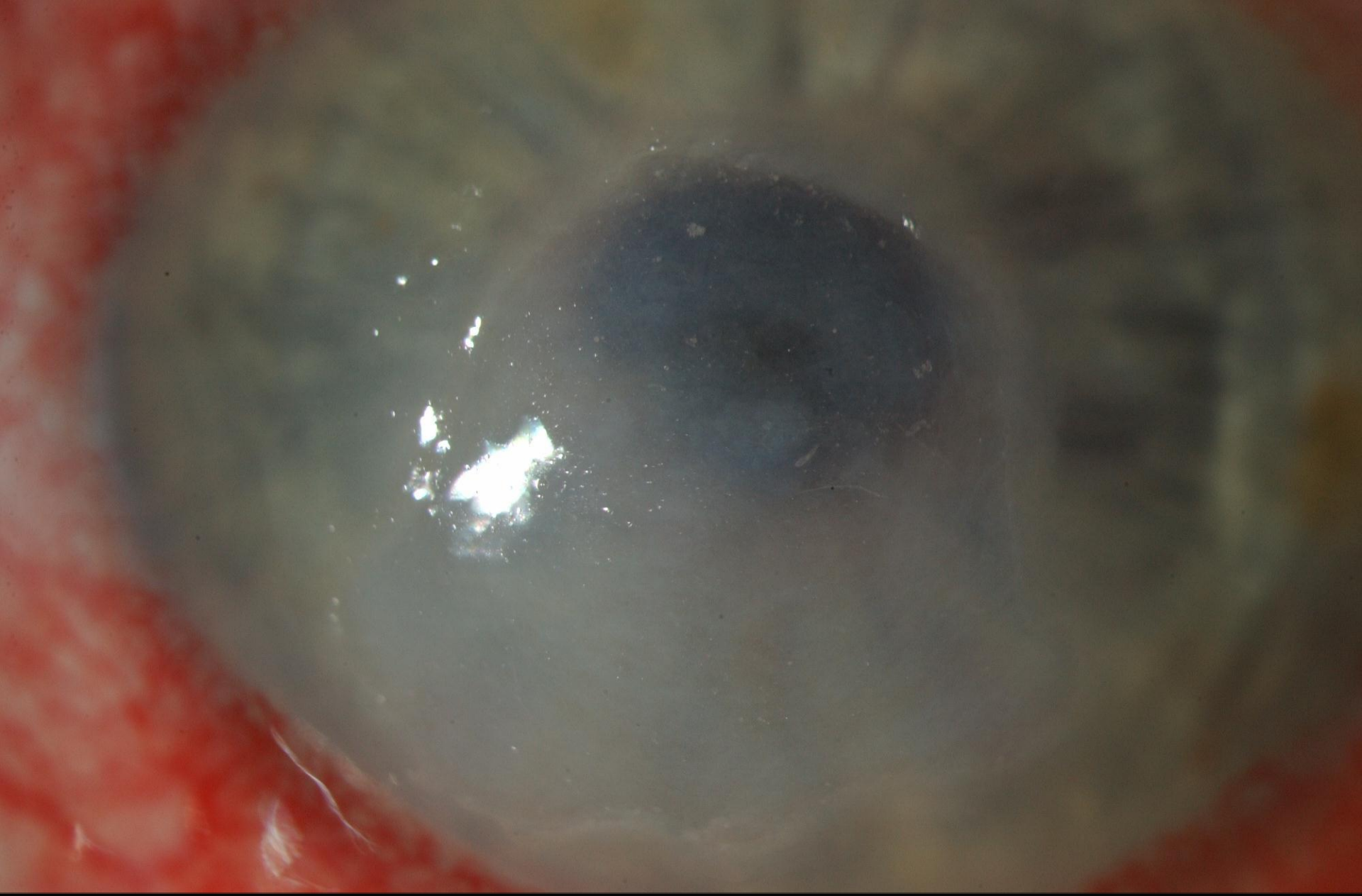
- Progressive corneal melt
- Microbial keratitis
- Risk of perforation
- Risk vs benefit assessment for steroid
- Oral Valaciclovir
- Flarex BD
- Specialist corneal management



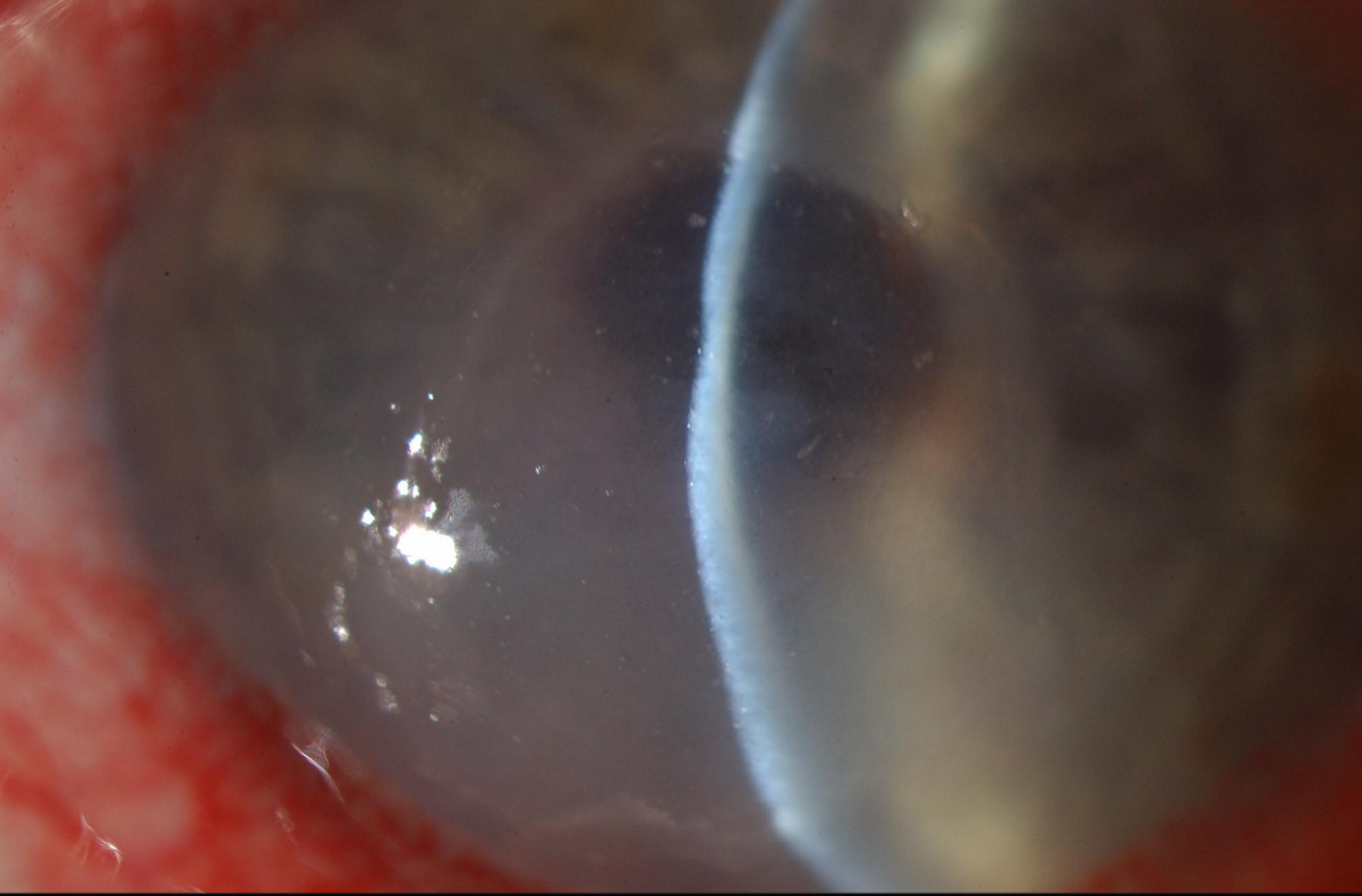
→ OK to delay steroid until epithelium healed

HSV stromal keratitis with ulceration

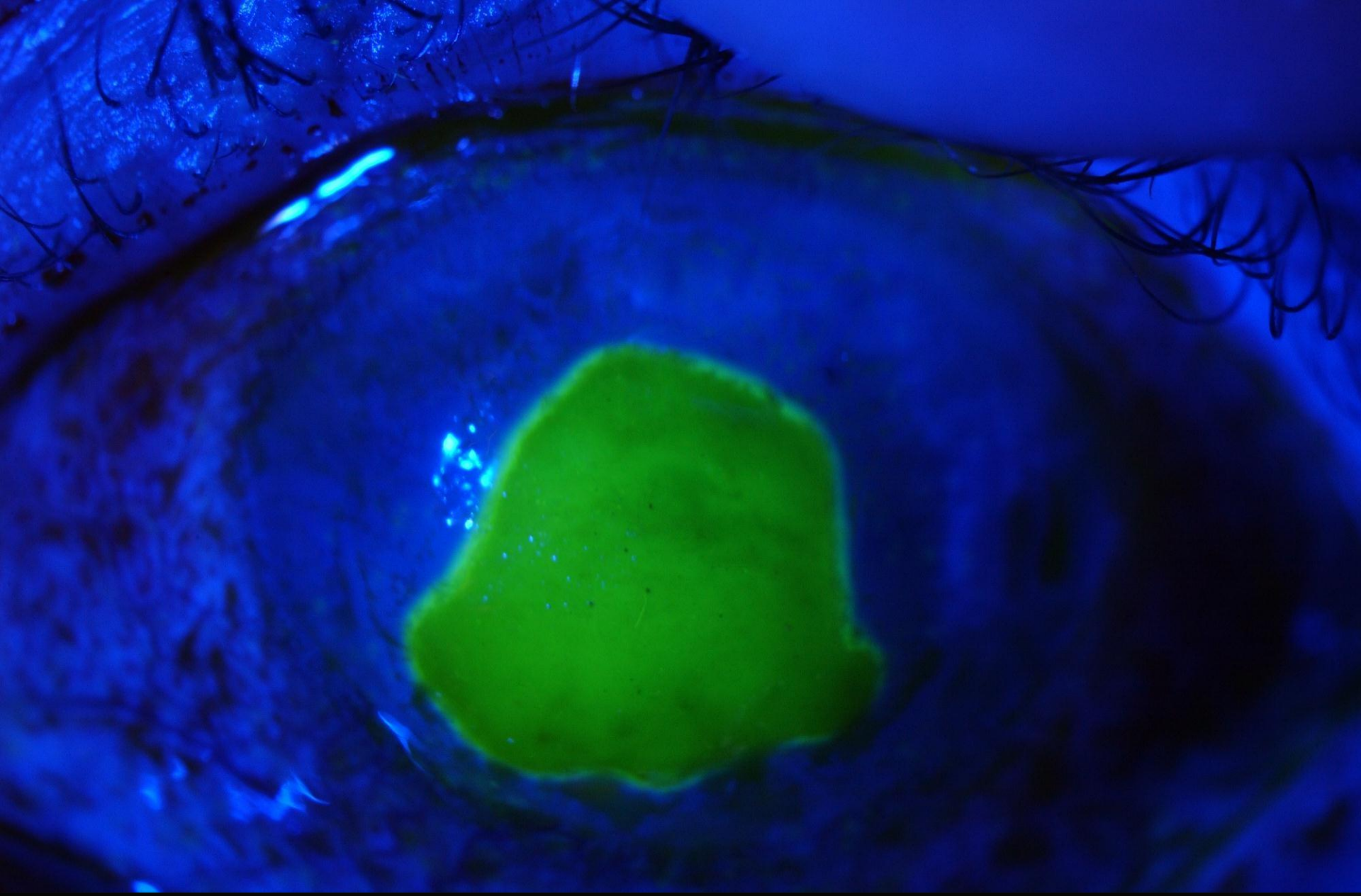
HSV stromal keratitis with ulceration



HSV stromal keratitis with ulceration – persistent ED



HSV stromal keratitis with ulceration – persistent ED

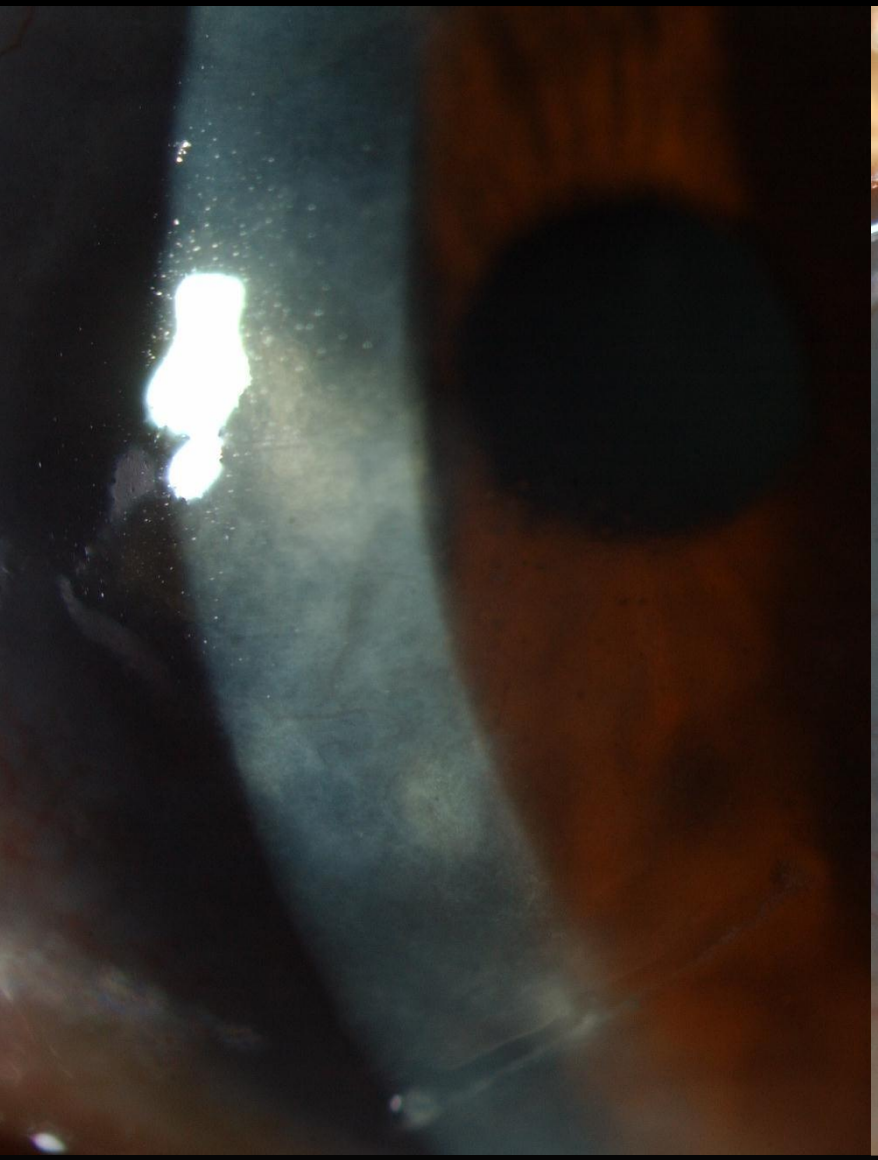


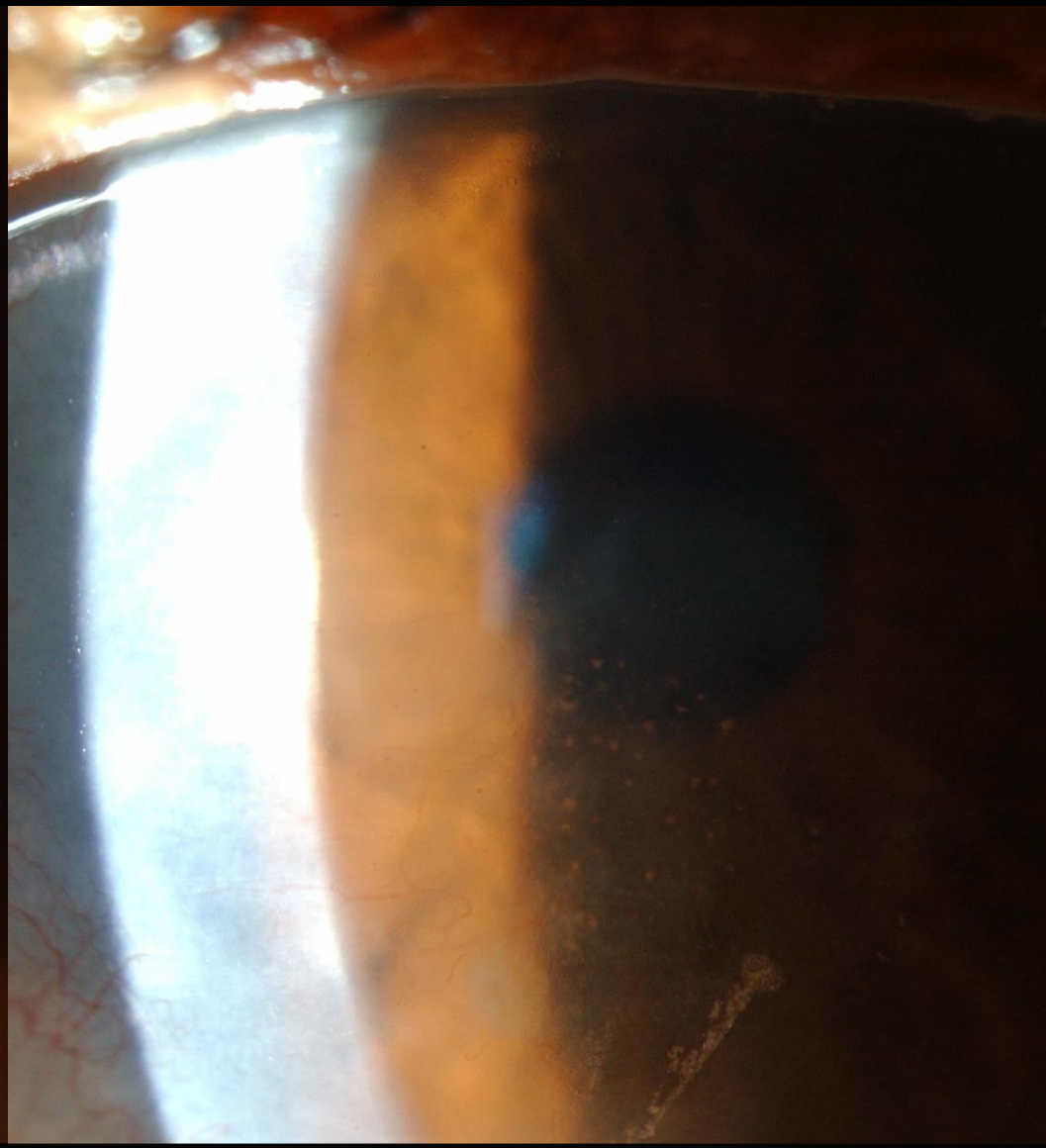
HSV stromal keratitis with ulceration – persistent ED

4.
HSV Endothelial Keratitis

HSV Endothelial Keratitis

Clinical diagnosis	+/- Reduced corneal sensation Localised endothelial dysfunction causes a disc-shaped area of corneal oedema ("disciform") Minimal inflammation of stroma Usually focal keratic precipitates ("KPs") underlying the oedema
Laboratory diagnosis	Anterior chamber tap for viral PCR
Differential diagnosis	Any form of keratouveitis Varicella zoster virus Posner Schlossman syndrome CMV endothelial keratitis Corneal graft rejection
Treatment	Oral Valaciclovir 500mg 3 x daily for 1 week then once daily g. Prednefrin Forte 4-6 times daily start immediately





HSV stromal keratitis without ulceration

HSV Keratitis - summary

Common

Good evidence for effective treatments

Goals of management

- Early diagnosis
- Suspect in atypical cases of keratitis
- Treatment targeted to the specific type of keratitis
- Prophylaxis in recurrent cases

AAO guidelines an excellent resource

HSV Keratitis – useful references

- American Academy of Ophthalmology:

White ML, Chodosh J. Herpes Simplex Virus Keratitis: a treatment guideline. Massachusetts Eye and Ear Infirmary 2014

- Cochrane review:

Wilhelmus 2011

- Systematic review:

Guess et al. Evidence-based treatment of Herpes Simplex Keratitis: A systematic review. Ocul Surf 2007:5,240

- Herpetic Eye Disease Study (HEDS):

HEDS I: Arch Ophthal 1997;115:703-12

HEDS II: Ophthal 1994;101:1883-96

Zoster Keratitis

There are 1,000,000 new cases of Herpes Zoster per year in the USA, with 10 - 20% being HZO
- ZEDS study details

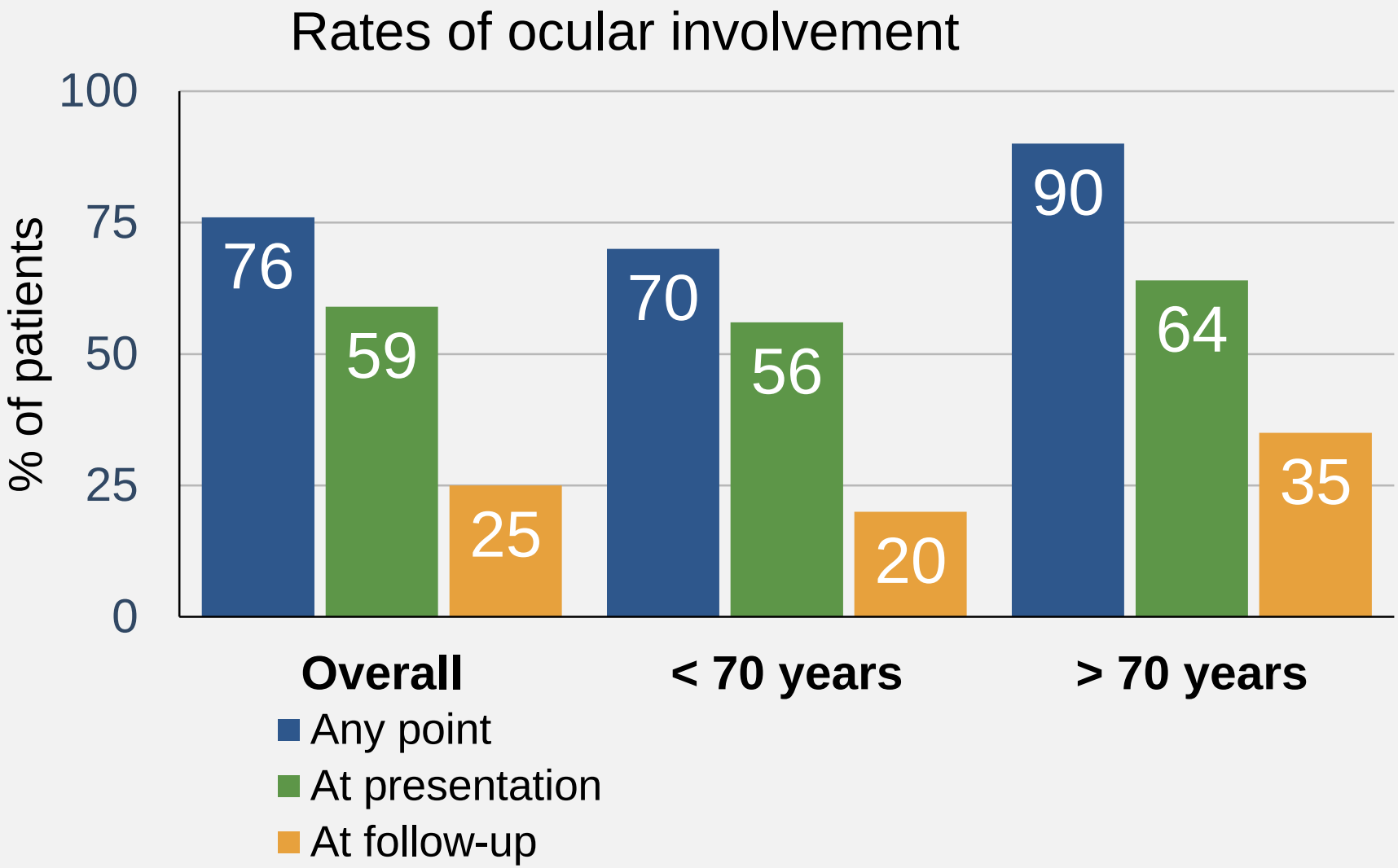
Herpes Zoster Ophthalmicus at RVEEH Emergency Department

An Audit

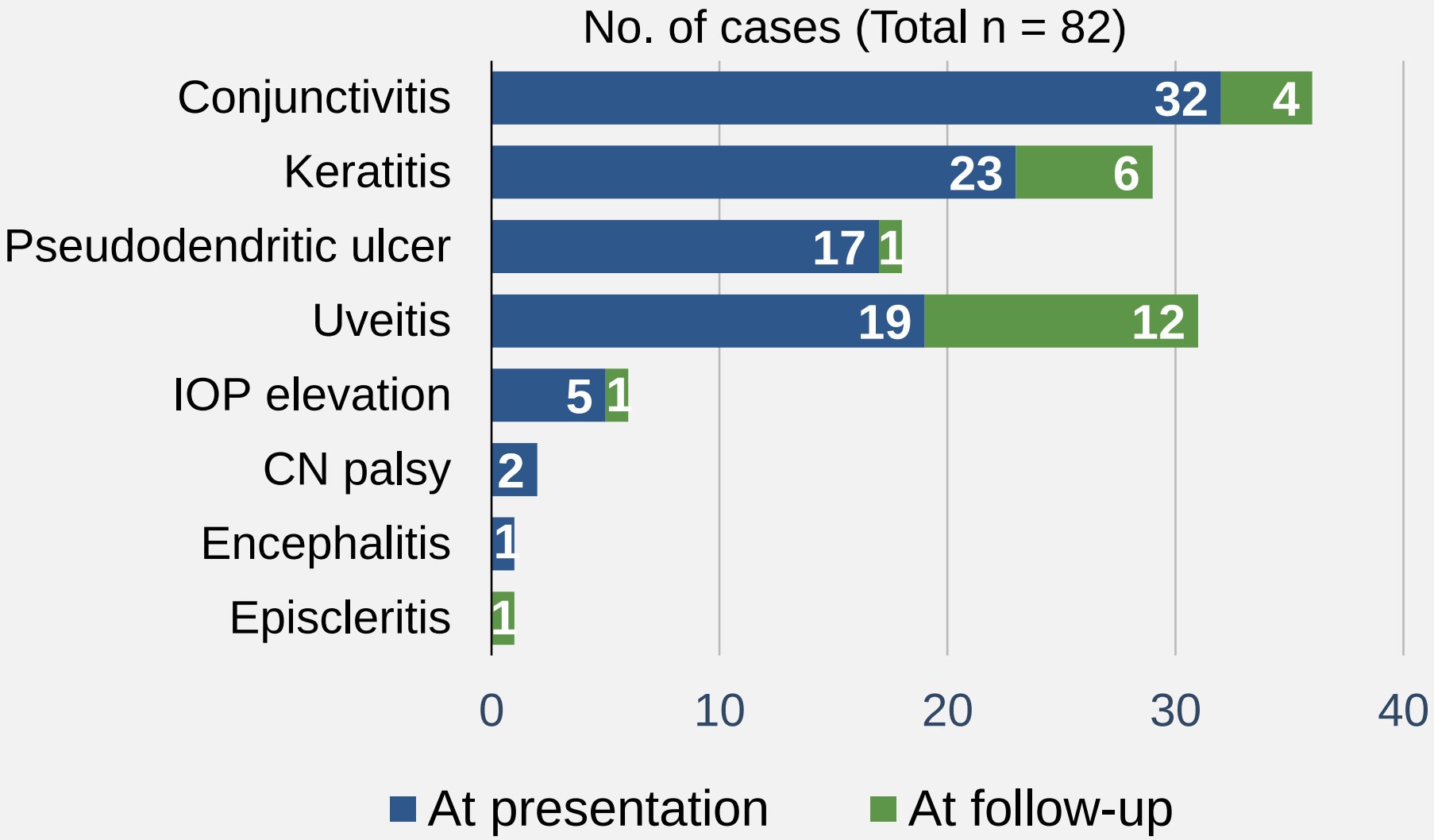
Eamonn Fahy
Kristen Wells
Elsie Chan
Georgia Cleary
Carmel Crock

Melbourne Ophthalmic Alumni Meeting
June 18th 2016

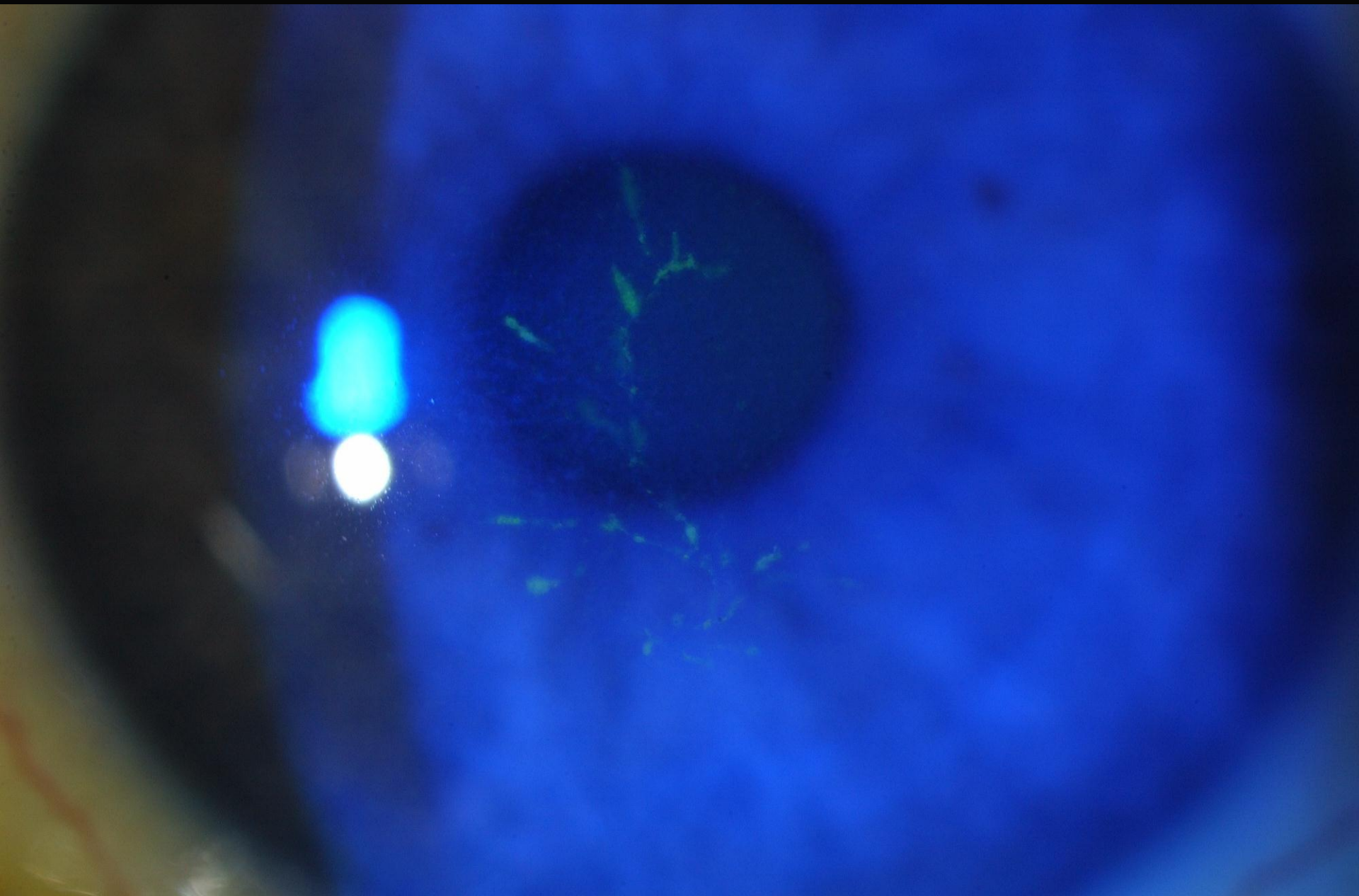
Results - Ocular involvement



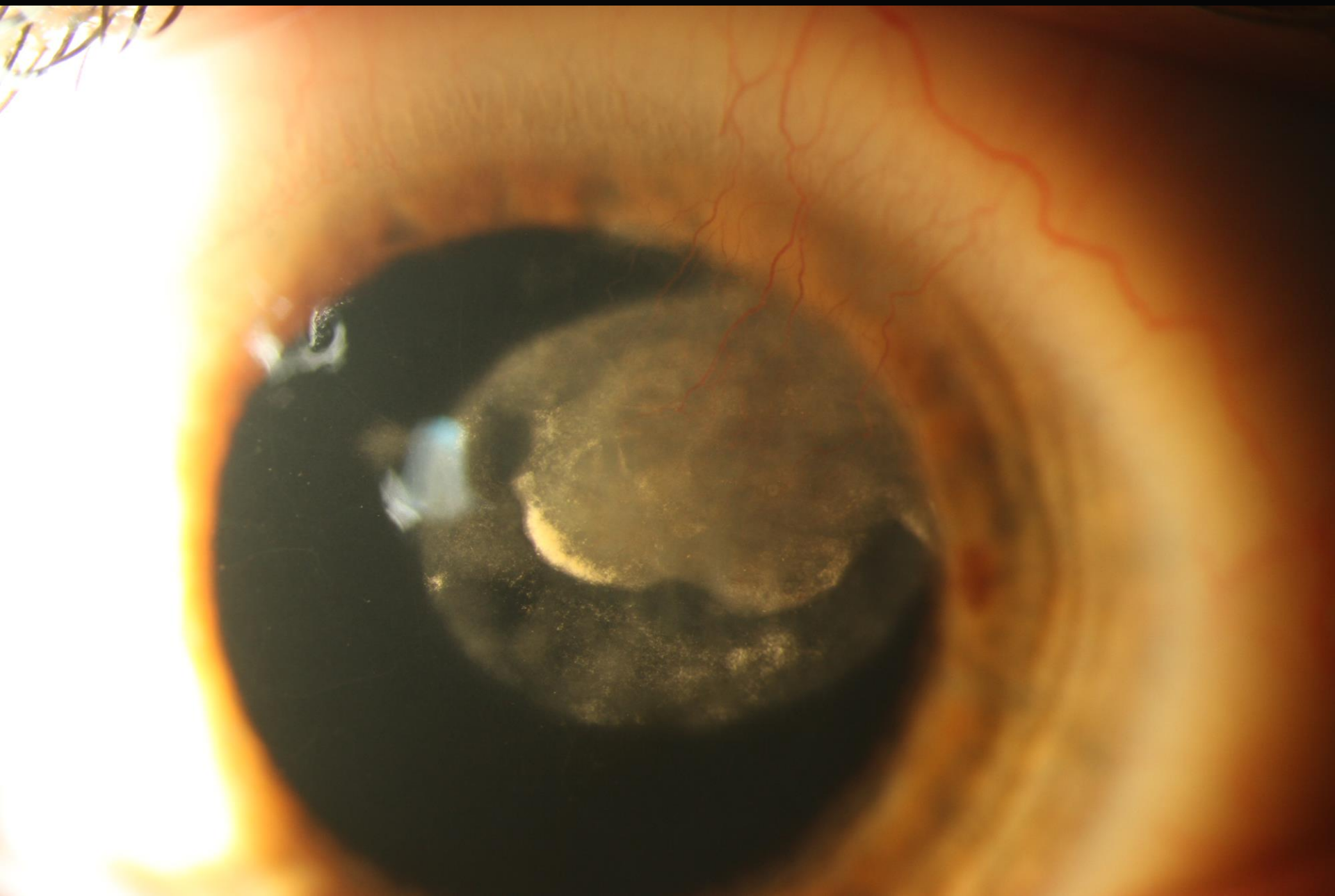
Results - Ocular involvement



Zoster keratitis



Zoster keratitis



Zoster keratitis

Herpes Zoster Ophthalmicus

Acute presentation: treatment well defined

- Oral antiviral, preferably within 72 hours
- Valaciclovir 1g TDS for 1 week
- < 72 hour: lower risk post herpetic neuralgia

Then what?

"What can I do to stop this happening?"

- Preventing shingles
- Treating recurrences of zoster eye disease
- Preventing spread of VZV

ZOSTAVAX®

Zoster Virus Vaccine Live (Oka/Merck), Refrigerator Stable.

Consumer Medicine Information

What is in this leaflet

This leaflet answers some common questions about ZOSTAVAX. It does not contain all the available information. It does not take the place of talking to your doctor or pharmacist.

All medicines and vaccines have risks and benefits. Your doctor has weighed the risks of you being given ZOSTAVAX against the expected benefits it will have for you.

If you have any concerns about being given this vaccine, ask your doctor or pharmacist.

Keep this leaflet.

You may need to read it again.

result in scarring. The blisters can persist for several weeks. They often break out in one part of the body. The nerve pain that comes from shingles can last for months or even years after the rash heals.

Shingles is caused by the same virus that causes chickenpox (varicella-zoster virus). After your chickenpox blisters heal, the virus that caused them stays in your body in nerve cells. The virus may be there for many years and not cause a problem. Sometimes, though, it may become active again. If this happens, it can cause a blistering and painful rash that may result in scarring. The blisters can persist for several weeks. They often break out in one part of the body.

Shingles can be serious. Sometimes the nerve pain caused by shingles can

- loss of hearing or vision.

Almost every adult has had chickenpox and so is at risk for shingles. The risk increases as you get older. This is especially true if you are over 50 years of age.

How it works

ZOSTAVAX boosts your immune system to help protect you from shingles.

As with any vaccine, ZOSTAVAX may not protect all people who receive the vaccine.

Before you are given ZOSTAVAX

When you must not be given

FactSheet

Herpes zoster

NATIONAL CENTRE FOR IMMUNISATION RESEARCH & SURVEILLANCE

ZOSTER VACCINE FOR AUSTRALIAN ADULTS: INFORMATION FOR IMMUNISATION PROVIDERS

ncirs.org.au

Disease and epidemiology

- Herpes zoster or 'shingles' is a localised, painful, vesicular skin rash resulting from reactivation of the same virus (the varicella-zoster virus) that causes chickenpox earlier in life. Shingles can affect any part of the body but the rash classically takes the shape of a belt or band in the thoracic or lumbar region.
- Although usually self-limiting, shingles can lead to post-herpetic neuralgia (PHN), a chronic neuropathic pain syndrome, and other complications.
- About 20–30% of people will have shingles in their lifetime, most after the age of 50 years. Older people (particularly those aged over 70 years) are also more likely to have shingles complicated by PHN.

Who should be vaccinated

- There is one zoster vaccine that is registered for use in people aged 50 years and over as a single dose. It is recommended for adults aged 60 years and over who are not immunocompromised.
- Zoster vaccine is funded under the National Immunisation Program for persons aged 70 years, with catch-up for those aged 71–79 years also funded until October 2021.

Who should *not* be vaccinated

- People who are immunocompromised due to disease or medication, pregnant women, and those

Zostavax

Who can have it?

Licenced for use from 50 years and above

Shingles immunisation is recommended for:

- adults aged 70 years to 79 years, for free under the National Immunisation Program (NIP)
- adults aged 60 to 69 years
- adults 80 years and older
- adults aged 50 or over who live in the same household as someone who has a weakened immune system

Zostavax

Can you still get shingles after Zostavax?

YES

In 70 – 79 year olds

- prevents 41% of cases of shingles
- prevents 2/3 of cases of post herpetic neuralgia

If shingles occurs, the pain, severity and duration is reduced by 50%.

Zostavax after shingles – wait 3 years

Immunity boosted by having shingles / HZO!

Zoster Eye Disease Study (ZEDS)

Objective = determine whether prolonged suppressive oral antiviral (Valaciclovir) reduces complications of HZO

- Suppressive antiviral in patients with prior episodes of zoster eye disease – does it reduce recurrences
- Suppressive antiviral – does it reduce post herpetic neuralgia

Now recruiting!!

Current Practice Patterns and Opinions on the Management of Recent-Onset or Chronic Herpes Zoster Ophthalmicus of Zoster Eye Disease Study Investigators

Danielle M. Lo, MD, Bennie H. Jeng, MD,† Colleen Gillespie, PhD,‡ Mengfei Wu, MS,* and Elisabeth J. Cohen, MD**

Purpose: To determine practices and opinions among study investigators in the Zoster Eye Disease Study (ZEDS) regarding suppressive valacyclovir treatment for recent-onset and chronic herpes zoster ophthalmicus (HZO).

Methods: An Internet-based survey was distributed to 170 ZEDS study investigators with questions regarding treatment practices for stromal keratitis in HZO and opinions regarding the efficacy of prolonged antiviral prophylaxis.

Results: The response rate was 72.4% (123/170). Topical steroids and oral antivirals were used by the majority of respondents for stromal keratitis in both recent-onset (69.1%, 85/123) and chronic HZO (63.4%, 78/123) ($P = 0.86$). The duration of treatment was similar in both recent-onset and chronic HZO ($P = 0.58$) with 50.4% (124/246) of ZEDS investigators using prolonged treatment for stromal keratitis due to recent-onset or chronic HZO. The majority of ZEDS respondents believe that oral antivirals are effective during treatment (70.7%, 87/123).

Conclusions: Approximately half of ZEDS investigators treat HZO with prolonged oral antivirals, in addition to topical steroids, and two-thirds believe that it is effective. Completion of ZEDS is

Herpes zoster ophthalmicus (HZO) is caused by localized reactivation of the varicella zoster virus (VZV) in the ophthalmic division of cranial nerve V. Herpes zoster infections have serious complications including an acute unilateral painful rash, postherpetic neuralgia (a severely debilitating chronic pain syndrome), acute and chronic eye disease, and potentially fatal strokes. Recent studies using polymerase chain reaction testing have shown that some complications of HZO, including dendriform epithelial keratitis and iritis, are associated with chronic and/or recurrent active VZV infection.[1–6] Dendriform lesions respond to topical and systemic antiviral treatment.[6,7] In addition, corneas removed from patients with HZO during transplantation have been found by polymerase chain reaction to have specific VZV genomic DNA sequences up to 51 years after the HZO onset.[8] Furthermore, the Acyclovir Prevention Trial of the Herpetic Eye Disease Study determined that prolonged suppressive antiviral treatment significantly reduced recurrent eye disease caused by herpes simplex virus (HSV), a different herpes virus, and was most beneficial in stromal keratitis, a disease manifestation considered to be immune mediated with the role of active viral infection unknown.[9] This treatment is now standard care and

Prevent the spread of VZV

Advice for your HZO patients

- Shingles is less contagious than chickenpox. The risk of spreading the disease is low if the rash is covered. When the rash has developed crusts, you are no longer infectious.

If you have shingles, you should:

- cover the rash (if possible)
- avoid touching or scratching the rash
- wash your hands often to prevent the virus from spreading

Avoid contact with:

- pregnant women who have never had chickenpox or the chickenpox vaccine
- premature or low birthweight babies
- children who have not had chickenpox or the chickenpox vaccine (MMRV vaccine at 18 months)
- people with weakened immune systems

Adenovirus

PUBLIC HEALTH MESSAGE

Adenovirus Conjunctivitis

Eye pain + / discomfort	93.3%
Hyperaemia	93.3%
Follicles	80.3%
Papillae	16.5%
Watery discharge	33.5%
Purulent discharge	31.3%
Pseudomembranes	12.1%
Pre-auricular lymphadenopathy	11.2%
Bilateral symptoms +/- signs	64.3%

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Viral conjunctivitis: a retrospective study in an Australian hospital

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ABSTRACT

Importance: To update the literature on the current trends of viral conjunctivitis infections in Sydney, Australia.
Background: To find correlations between viral and patient characteristics on disease outcomes and to assess the rates of antibiotic and steroid use in patients with viral conjunctivitis prior to and after assessment by ophthalmology trainees.
Design: Retrospective single-centre case series.
Participants: 368 eyes of 224 patients diagnosed with viral conjunctivitis at the Sydney Eye Hospital from 1 st January - 31 st March 2017.
Methods: Patients were identified from hospital records or polymerase chain reaction results.
Results: 368 eyes of 224 patients, median age 35.3 (range 7–82) and 59.8% males, were included. 152 (67.9%) patients presented already on antibiotic treatment. Most patients (83.5%) had no previous ocular history aside from 35 (15.6%) who were regular contact lens wearers. PCR was performed in 170 (75.9%) patients, with 92 (54.1%) positive for adenovirus, and 7 (4.1%) for HSV. The average duration of symptoms prior to presentation was 6.3 days. 177 (78.0%) patients presented within 1 week of symptom onset and these patients were more likely to be adenovirus positive on PCR (OR = 2.37). Patients with symptoms of longer duration were more likely to have photophobia (OR = 2.96) and have had steroid treatment (OR = 3.80).
Conclusions and relevance: Patients with viral conjunctivitis typically presented within a week of symptom onset, with bilateral disease and on topical antibiotics. Pseudomembranes and a palpable preauricular lymph node were not common. As treatments emerge for viral conjunctivitis patients may need to be encouraged to present earlier.

1. Introduction

Conjunctivitis is one of the most common ophthalmic presentations to the emergency department (ED) both in Australia and across the globe. It affects patients across all age groups and of any socioeconomic class [1]. Viral conjunctivitis is the most common cause of infectious conjunctivitis, accounting for 60–75% of cases [2,3]. It also has a considerable economic and societal impact due to a range of factors. These include the direct costs of general practitioner and emergency department visits, the costs of diagnostic tests and prescription treatments, and indirect costs associated with loss of work or time away from school or university [3].

There have been very few epidemiological studies on patterns of viral conjunctivitis in Australia in the past 30 years [4–6]. To date, no sex predilection for viral conjunctivitis has been found [7], however some subtypes of adenoviral conjunctivitis are more common in younger age groups [8]. Weather also appears to affect the incidence of adenoviral conjunctivitis, with outbreaks in Australia, China, and the United States tending to occur more frequently in the summer months [9]. While contact lens wear is known to be the single largest risk factor for microbial keratitis [10], there is no current evidence to suggest that contact lens wear is an independent risk factor for developing viral conjunctivitis. Diagnosis of viral conjunctivitis is based on clinical and laboratory findings. However, clinical diagnosis of adenoviral conjunctivitis has been shown to be unreliable particularly in primary care settings, with an inaccuracy rate of 50% when compared with laboratory-confirmed diagnoses [11]. Additionally, it has been difficult to clinically differentiate between follicular conjunctivitis caused by adenovirus, herpes simplex virus (HSV), varicella zoster virus (VZV), *Chlamydia trachomatis*, ocular surface medicamentosa, and ocular rosacea [12]. Correct and early identification of aetiology allows appropriate treatment and the avoidance of longer-term complications.

One of the most significant costs of viral conjunctivitis arises from prescription antibiotics [3]. In the Netherlands, around US $10.9

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Viral conjunctivitis
Sydney Eye Hospital
Jan – March 2017

368 eyes of 224 patients

HAdV PCR + in 54.1%

HSV PCR + in 4.1%

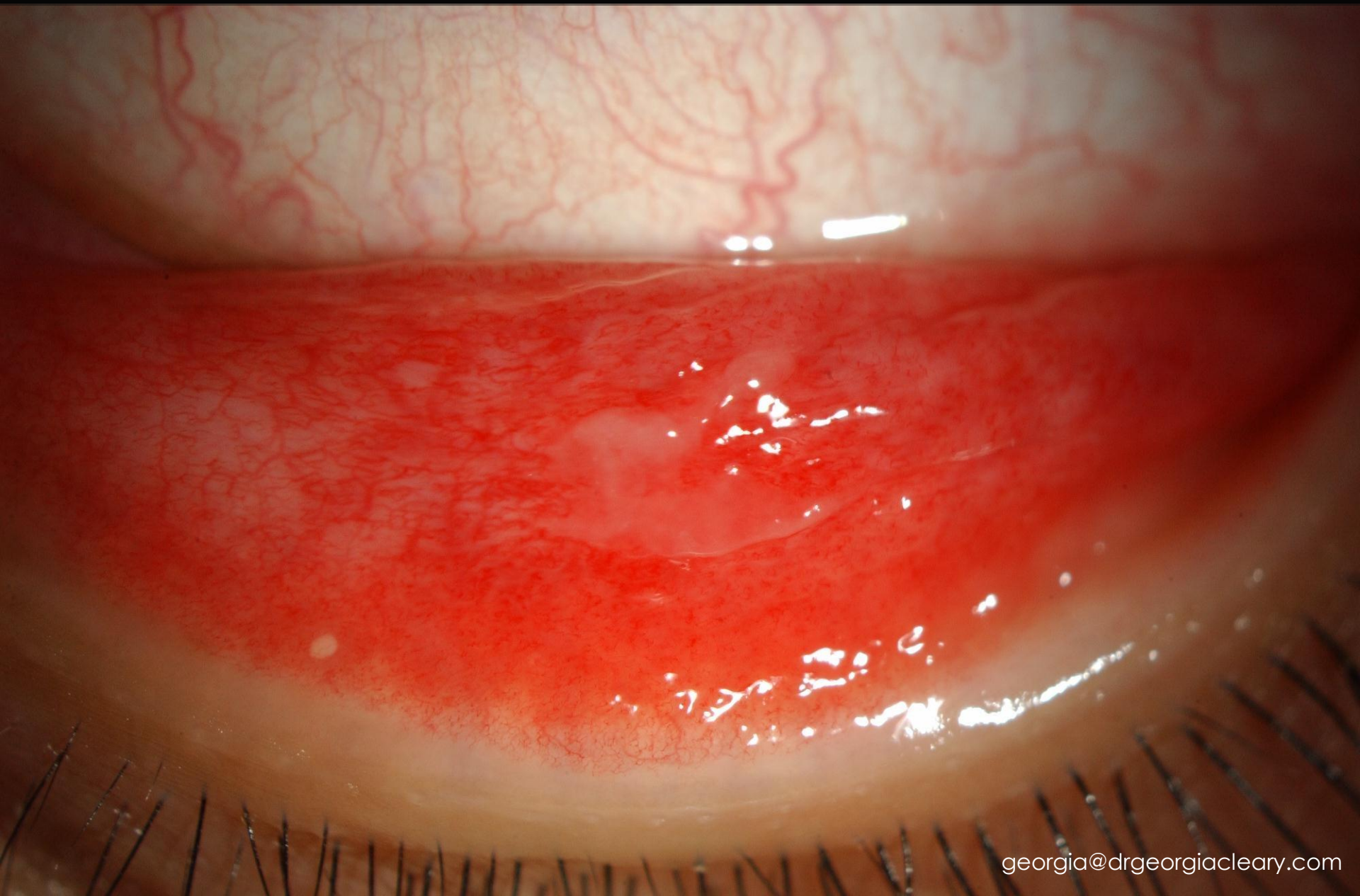
Follicular conjunctivitis

Follicular conjunctivitis

Conjunctival petechiae

Follicles & papillae

Pseudomembrane



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Adenoviral keratitis

LATER…

- Blurry vision
- Glare
- No longer infectious

Adenoviral keratitis

LATER…

- Blurry vision
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- No longer infectious

Adenoviral keratitis

LATER…

- Blurry vision
- Glare
- No longer infectious

SEASONAL VARIATION IN HUMAN ADENOVIRUS CONJUNCTIVITIS:
A 13-YEAR OBSERVATIONAL STUDY

Dr Eva (Yi Fan) Tang
Dr Georgia Cleary
RVEEH, Melbourne

RVEEH 2019

WHY DOES HAdV MATTER?

- Common
- Potential for misdiagnosis
- Young and working age population affected

- HIGHLY INFECTIOUS
- Virus may be spread in YOUR PRACTICE
- Knowledge of peak seasonal incidence may help plan care

AIM

- To identify the seasonal variation of adenoviral keratoconjunctivitis
- To review the current management patterns of diagnosed viral conjunctivitis

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METHODS

- Retrospective chart review
- Cases coded with a diagnosis of "viral conjunctivitis" identified from historical ED records
- Conjunctival swabs positive for Adenovirus PCR identified from St. Vincent's Microbiology laboratory

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RVEEH CPG

- Topical lubricants
- Cool compresses
- Peel pseudomembranes
- Swab if unsure of diagnosis

Topical steroids in cases of:

- Pseudomembranes
- Adenoviral keratitis, VA < 6/12

RESULTS

- Results collected from RVEEH ED 2006 - 2019
- 21,134 patients were diagnosed with viral conjunctivitis

- 52% were male
- Mean 40 years (range 7 months – 96 years)

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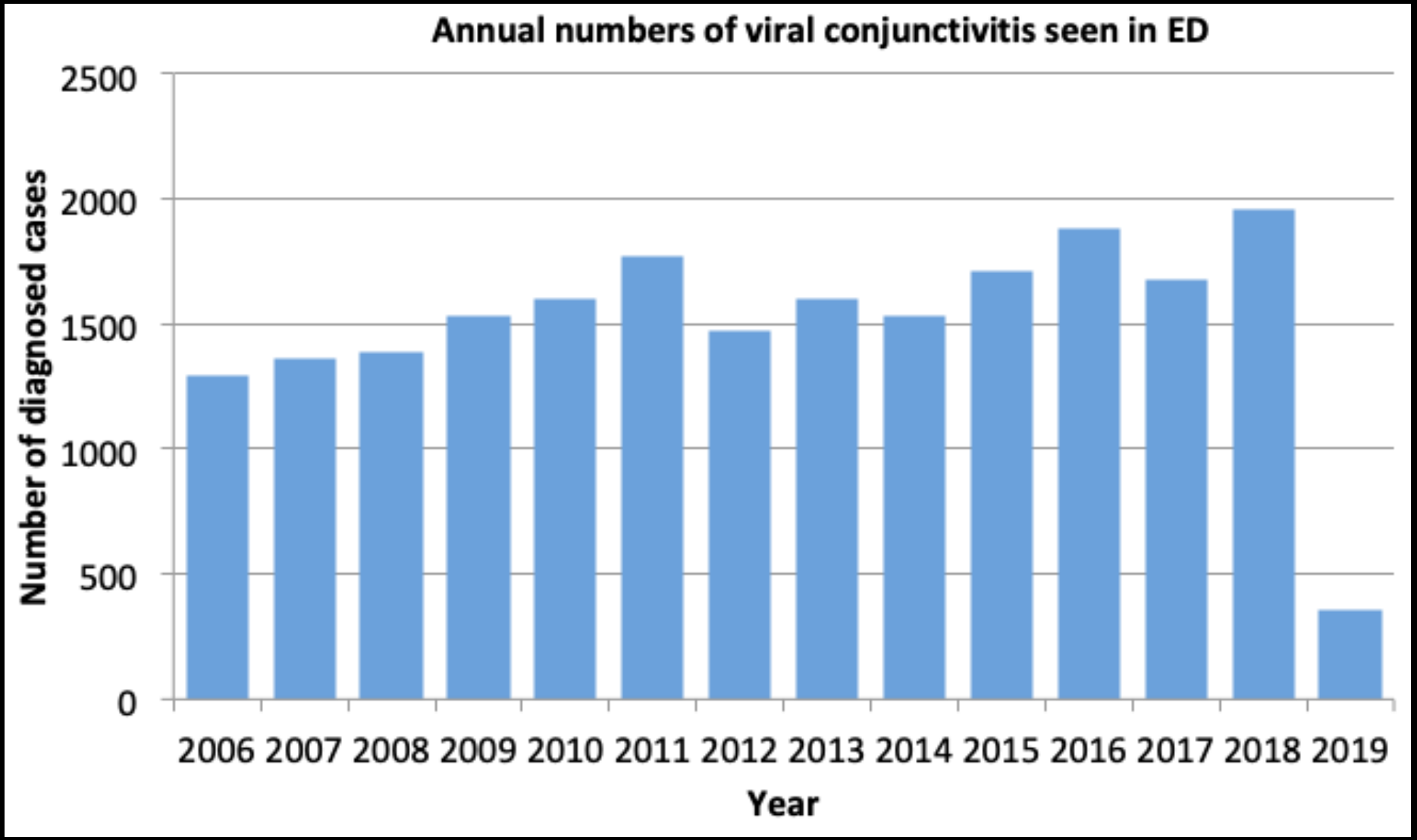
Diagnosis: Viral Conjunctivitis



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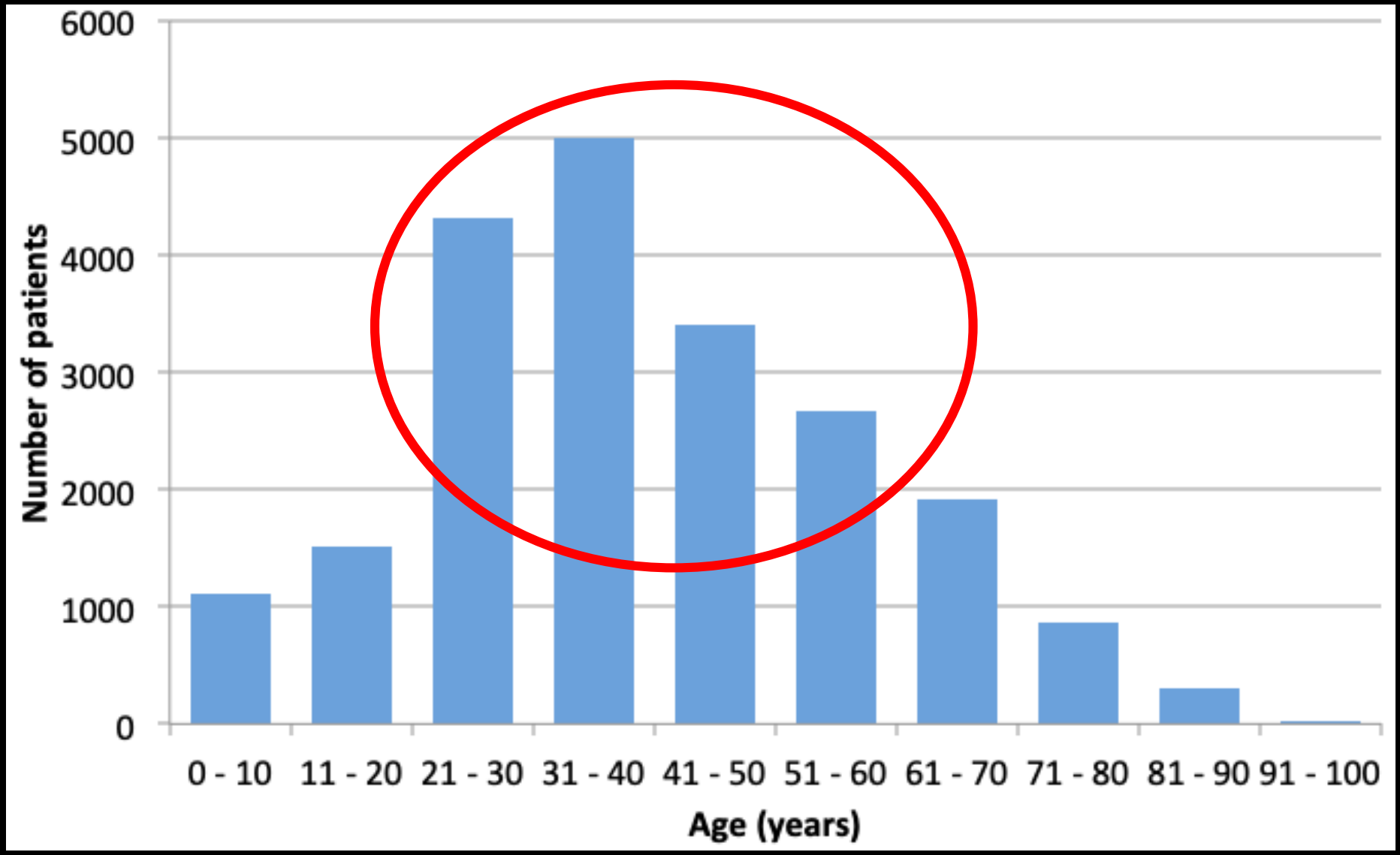
Diagnosis: Viral Conjunctivitis



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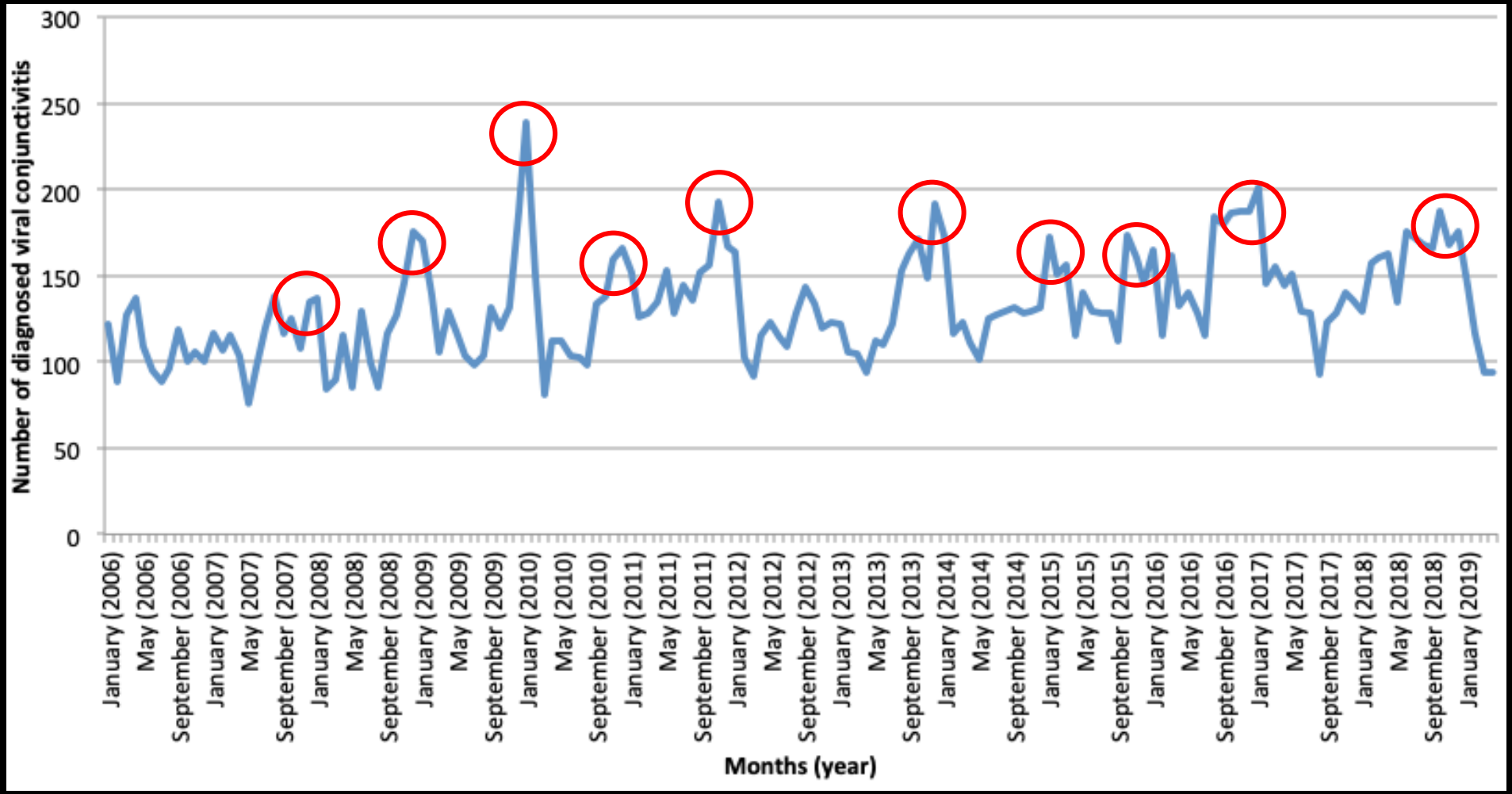
Viral conjunctivitis: Cases by month 2006 - 2019



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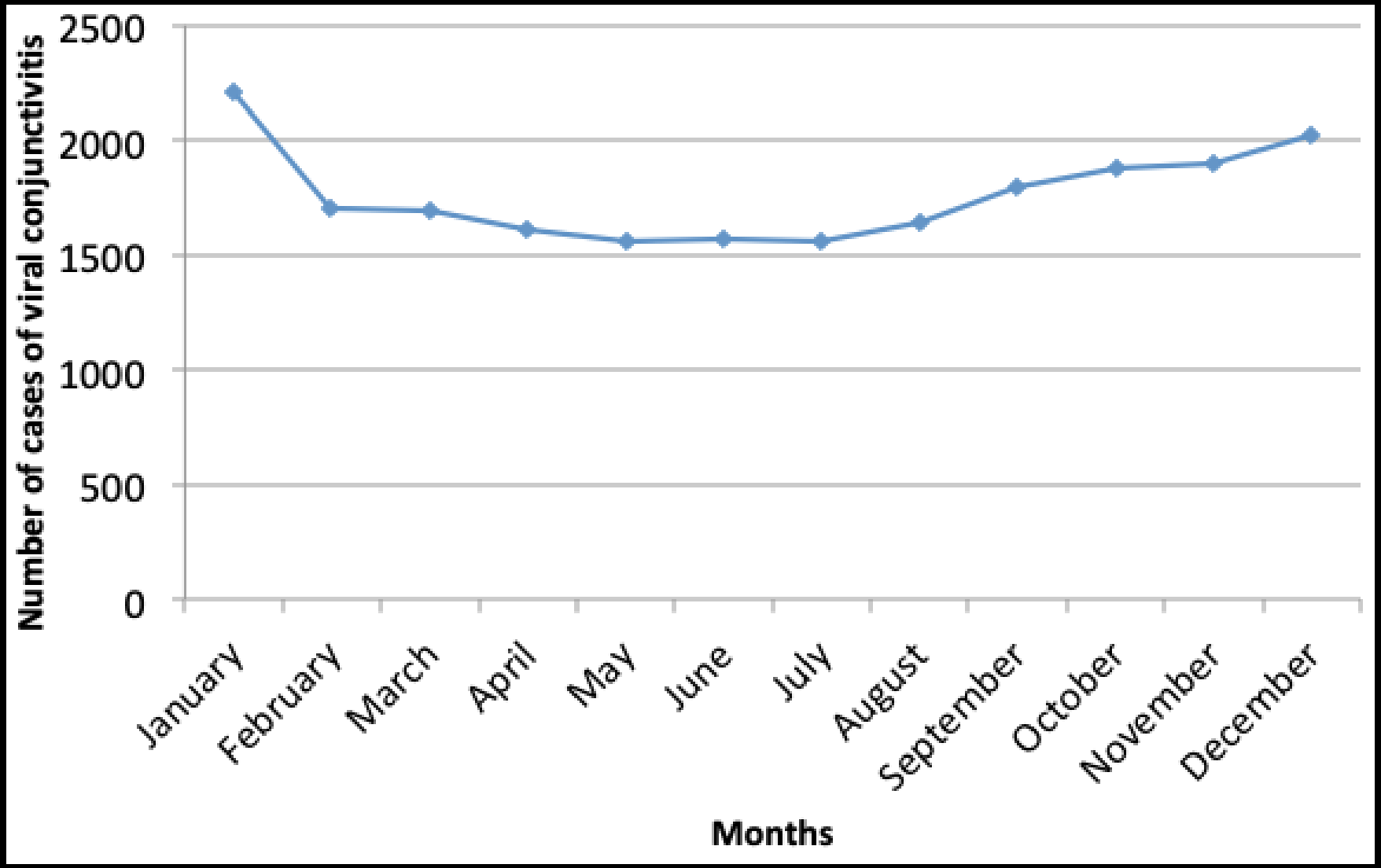
Viral conjunctivitis: Cases by month 2006 - 2019



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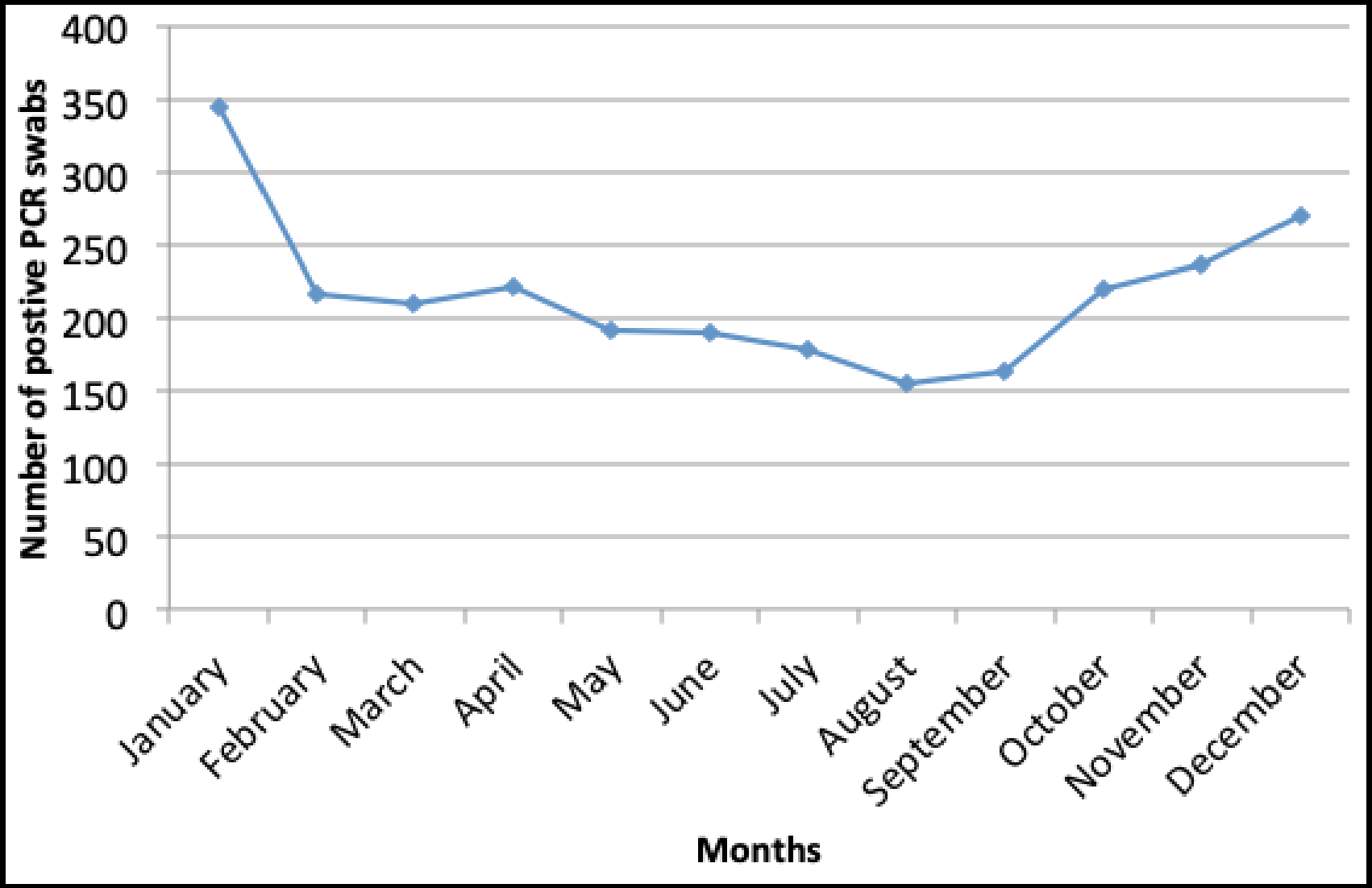
HAdV PCR positive: Cases by month 2006 - 2019



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CONCLUSIONS

- HAdV conjunctivitis is common
  > 1,500 cases per year at RVEEH ED

- Accounts for >6% of all presentations at RVEEH ED

- Biggest study in the Southern Hemisphere assessing caseload of viral conjunctivitis and seasonal variation

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CONCLUSIONS

- Peak incidence in the warmer months:
  NOVEMBER DECEMBER JANUARY

  → Think Adenovirus, diagnose early
  PREPARE YOUR PRACTICE
  - Identify cases from initial phone call / walk in
  - "Quarantine" area
  - Fast track
  - Get them out of your waiting room!

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BASIC ANTERIOR SEGMENT EXAMINATION

Goals =

- look for HAdV signs
- Exclude HSV keratitis / other corneal pathology

- Gloves
- "quick" VA
- Fluorescein
- Any corneal ED? Dendrite? SEI?
- Evert lids

The Conclusion

- OLD = HSV: looking at the evidence

Topical antiviral, oral antiviral, steroid

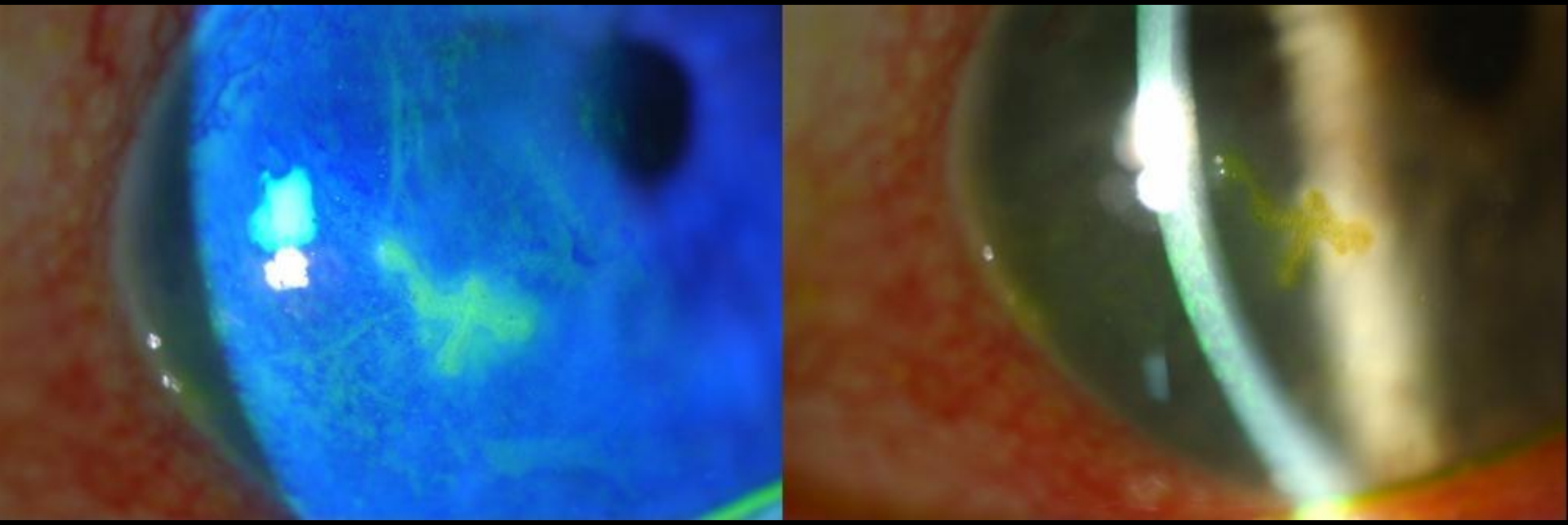
- NEW = HZO: waiting for evidence

Watch this space

- TRUE = It is Adenovirus season

Don't catch it!

Thank you!



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