Mee-ouch! Eye Surface Disease in Cats

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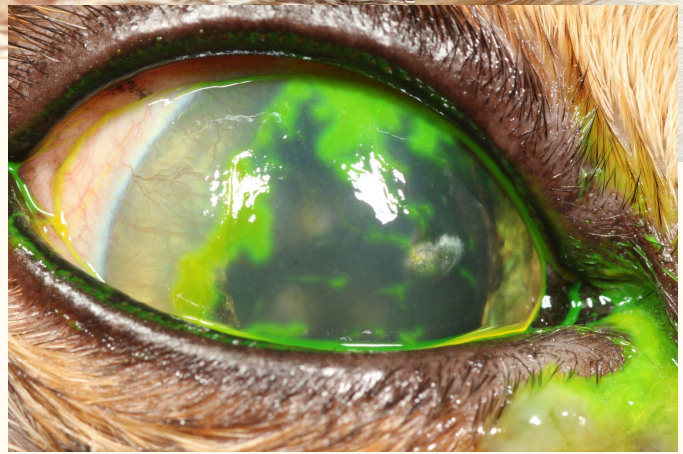


Overview

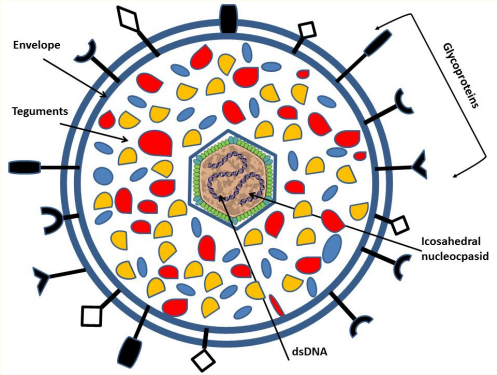
- FHV-1 pathogenesis
- Diagnostics
- Clinical signs/syndromes
- Treatments

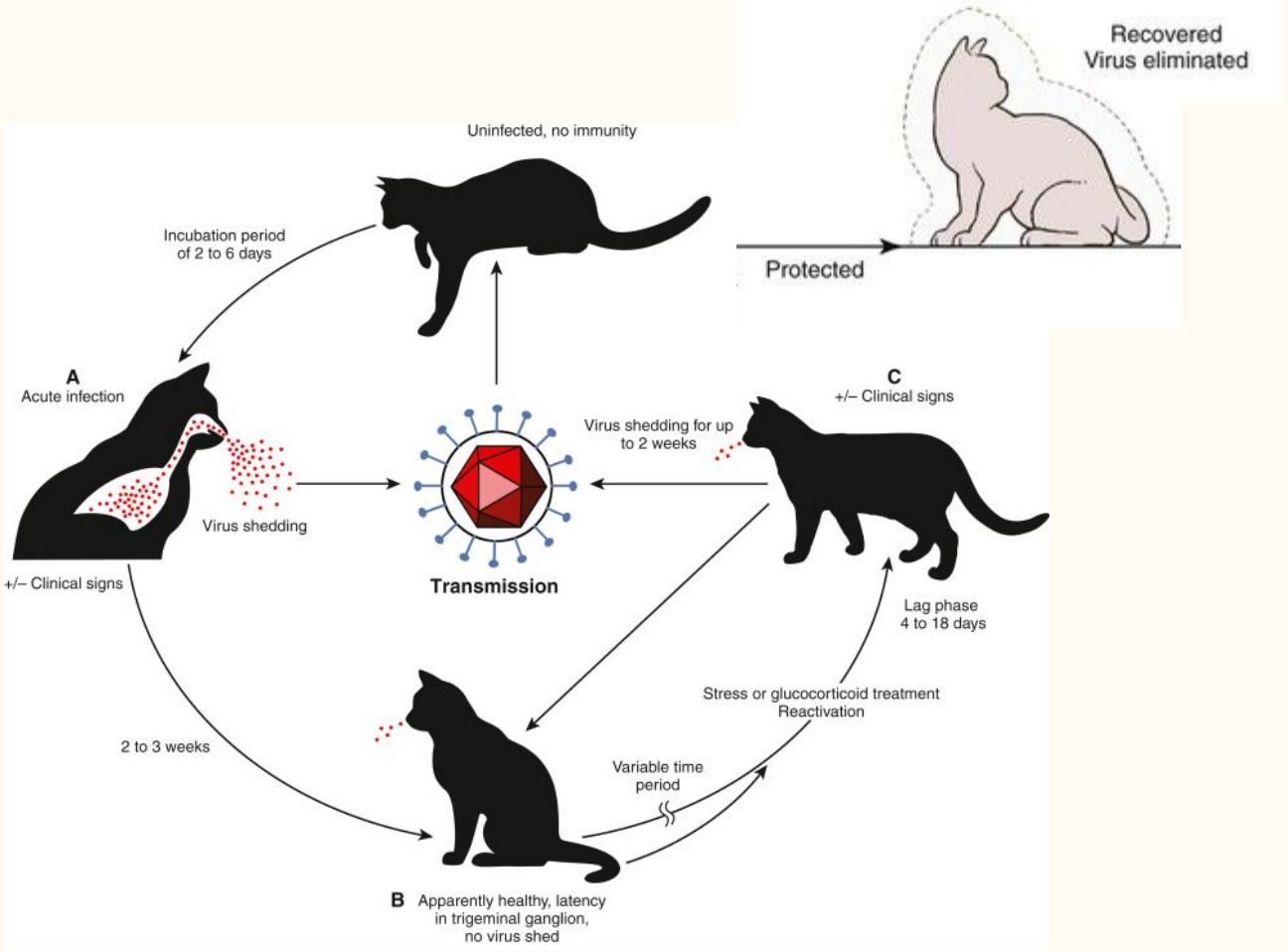
Feline Herpesvirus-1

- Large, double stranded DNA virus

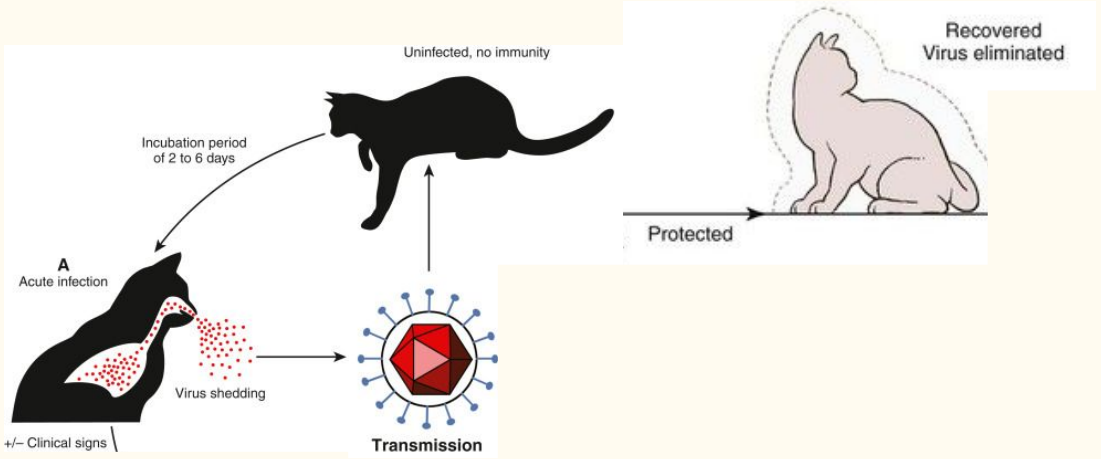
- Ubiquitous– seroprevalence of >95% through exposure and/or vaccination

- Latency allows for viral reservoir in population and spontaneous reactivation of disease




Recovered
Virus eliminated
Protected
Uninfected, no immunity
Incubation period
of 2 to 6 days
A
Acute infection
Virus shedding
+/– Clinical signs
Transmission
Virus shedding for up
to 2 weeks
C
+/– Clinical signs
Lag phase
4 to 18 days
Stress or glucocorticoid treatment
Reactivation
Variable time
period
2 to 3 weeks
B Apparently healthy, latency
in trigeminal ganglion,
no virus shed

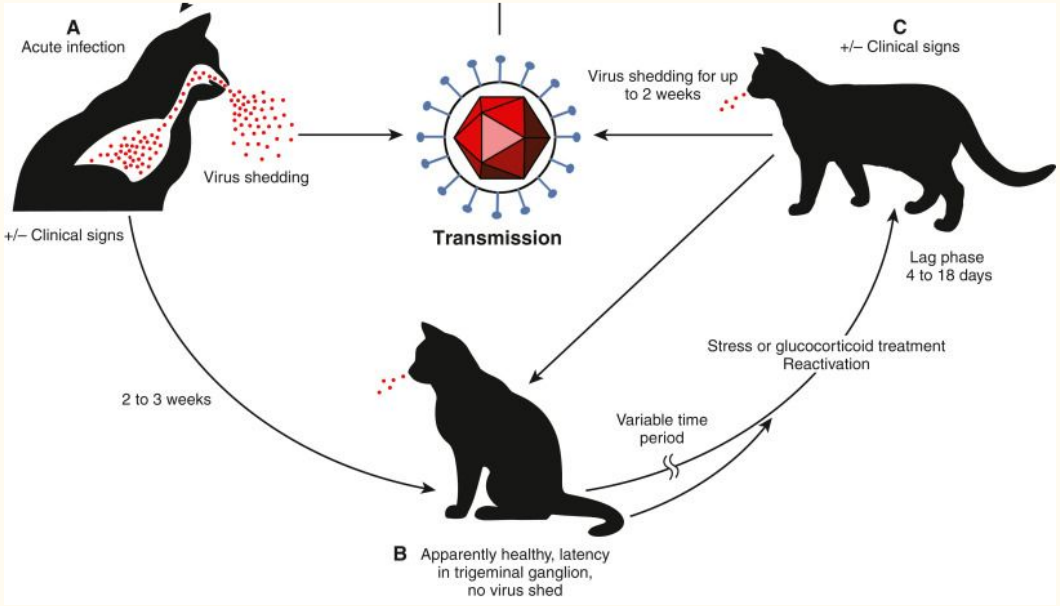
FHV-1 Pathogenesis



- Virus is cytopathic - causes epithelial surface erosion and inflammation
- Signs worsened by secondary bacterial infection
- Kittens typically recover in 10-14 days with supportive care
- ~20% of cats clear the infection and 80% become latent carriers

FHV-1 Pathogenesis

- Latency in nuclei of ganglionic neurons +/- corneal tissue
- Virus reactivated due to different factors – spontaneous, stress, immunosuppression, viral strain differences?
- Recrudescent disease tends to be systemically less severe– less URI component



Diagnostics

PCR - false negatives with latent infections, positive for chronic carriers (clinically normal cats) and recent vaccination

Serum antibody titers - not useful since most cats are seropositive from previous infection

IFA - Can remain positive life-long due to antibodies

Viral isolation - slower and less sensitive than PCR

Cytology - screen for eosinophilic keratitis (EK) and concurrent bacterial infection, cannot see viral particles directly

Diagnostics - often problematic

PCR - false negatives with latent infections, positive for chronic carriers (clinically normal cats), active infection, and recent vaccination

Serum antibody titers - not useful since most cats are seropositive from previous infection

IFA - Can remain positive life-long due to antibodies

Viral isolation - slower and less sensitive than PCR

Cytology - screen for eosinophilic keratitis (EK) and concurrent bacterial infection, cannot see viral particles directly

Diagnostics - reality

- Largely based on history and presentation
- Chronic or recurrent disease
- Poor response to antibiotics

FHV-1 disease patterns

Conjunctivitis

Symblepharon

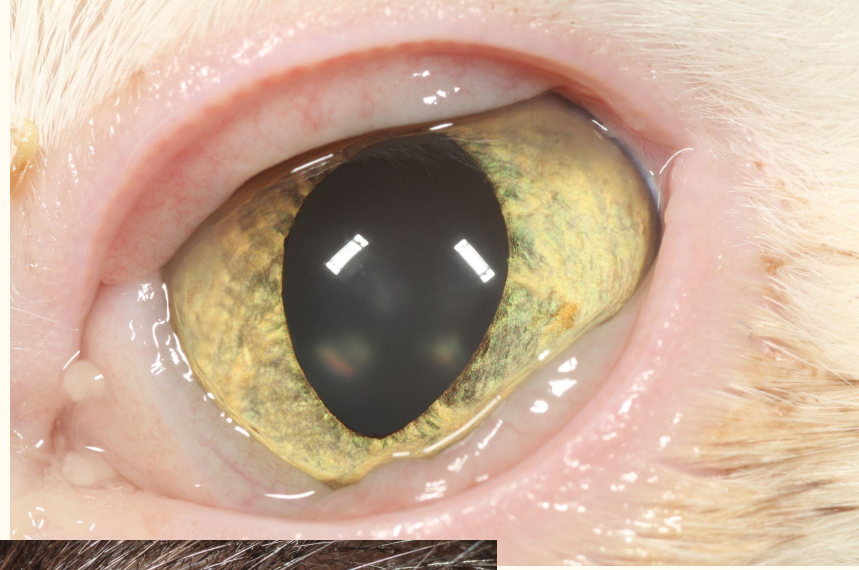
Corneal ulceration

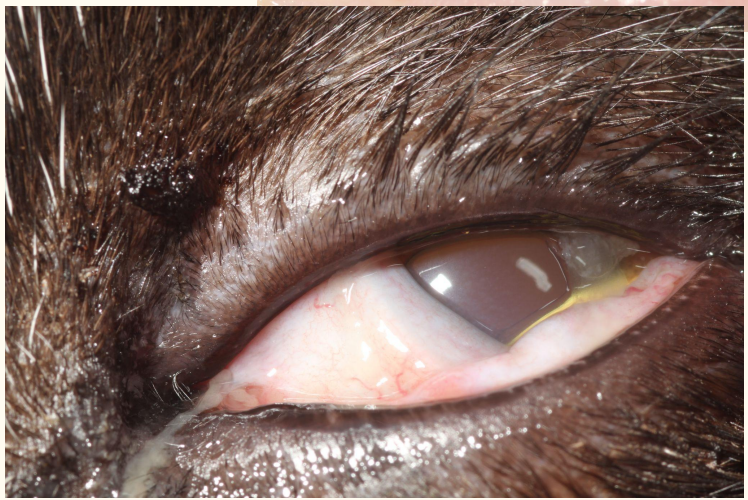
Corneal sequestrum

Eosinophilic keratitis

Conjunctivitis

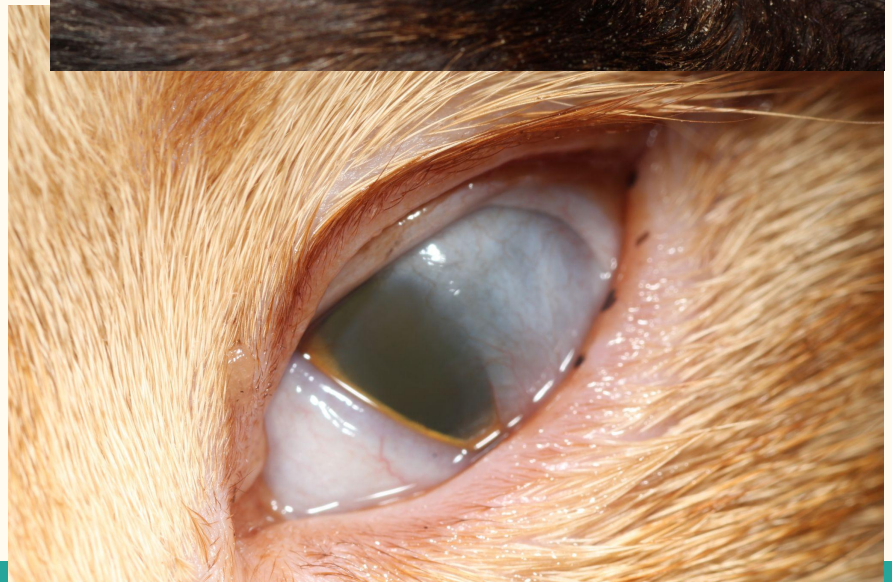
- Chemosis, hyperemia, discharge (often red to black), squinting
- Antiviral +/- abx

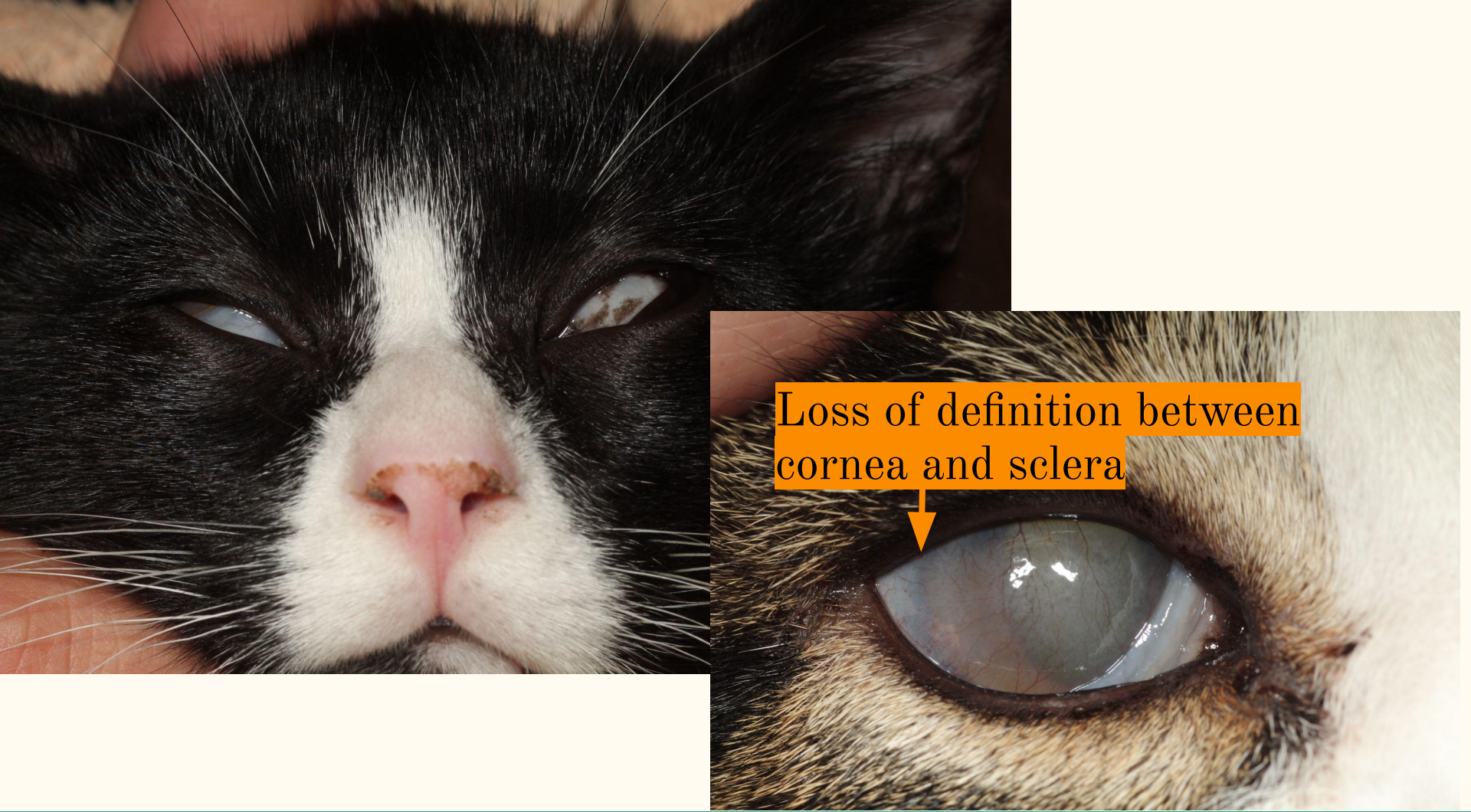




Symblepharon

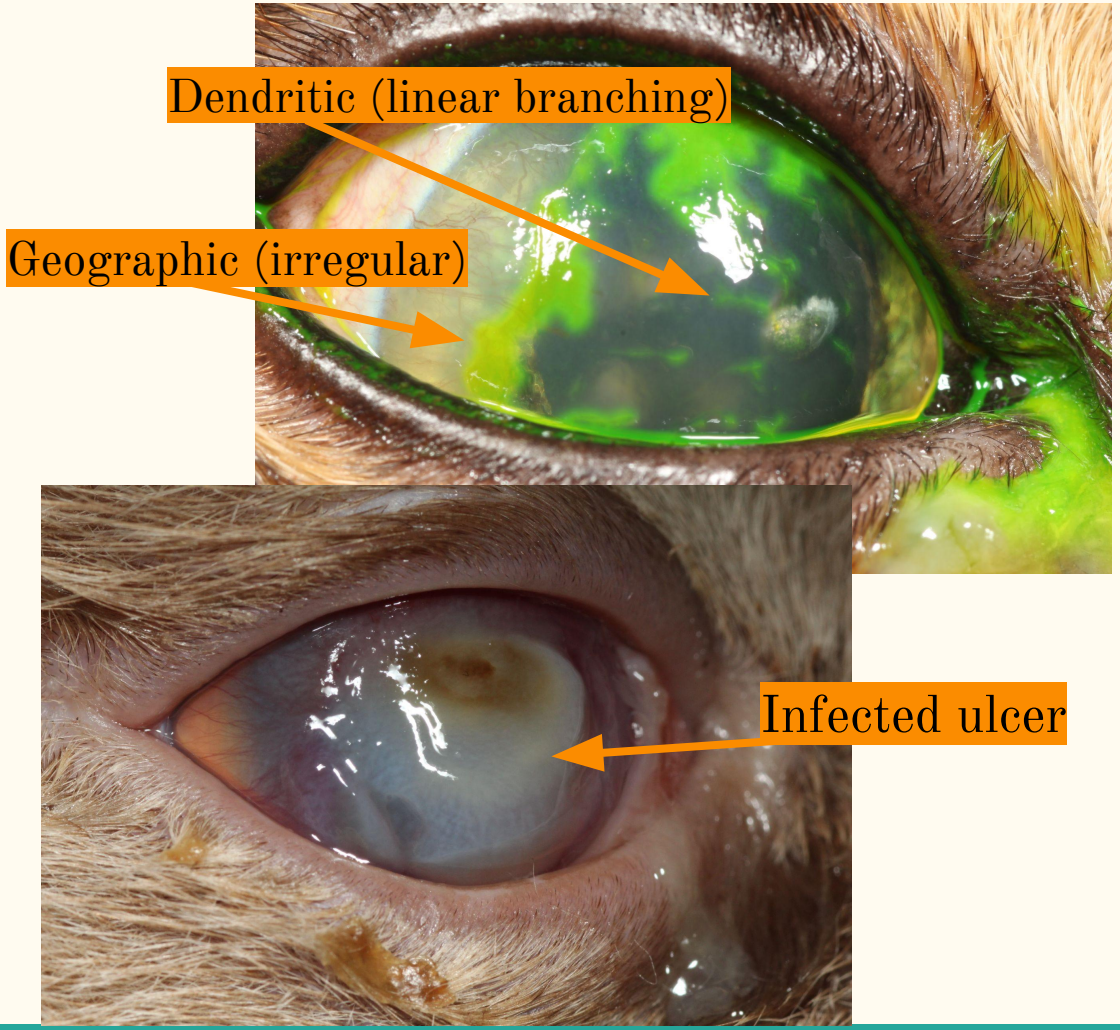
- Result of adhesions between ulcerated conjunctiva and cornea
- Appearance of lost of distinction between cornea and sclera
- Non-painful and permanent
- Surgical treatments not effective
- Prevention is key:
  - Treat primary infection
  - OTC 5% NaCl ointment




Loss of definition between cornea and sclera

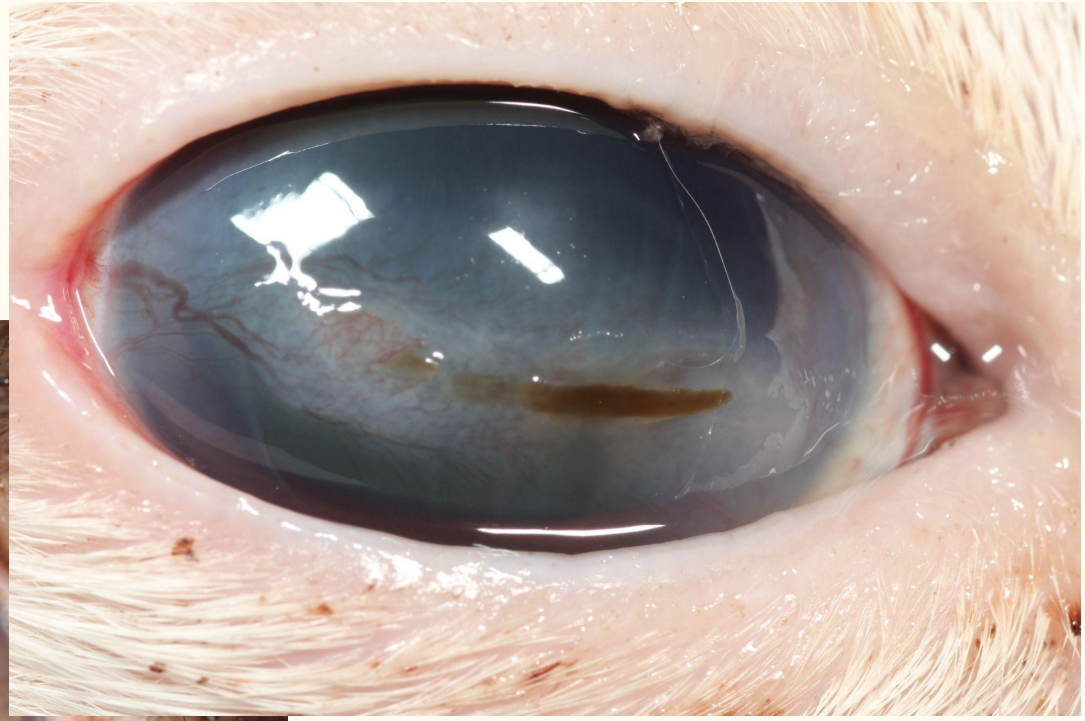
Corneal ulceration

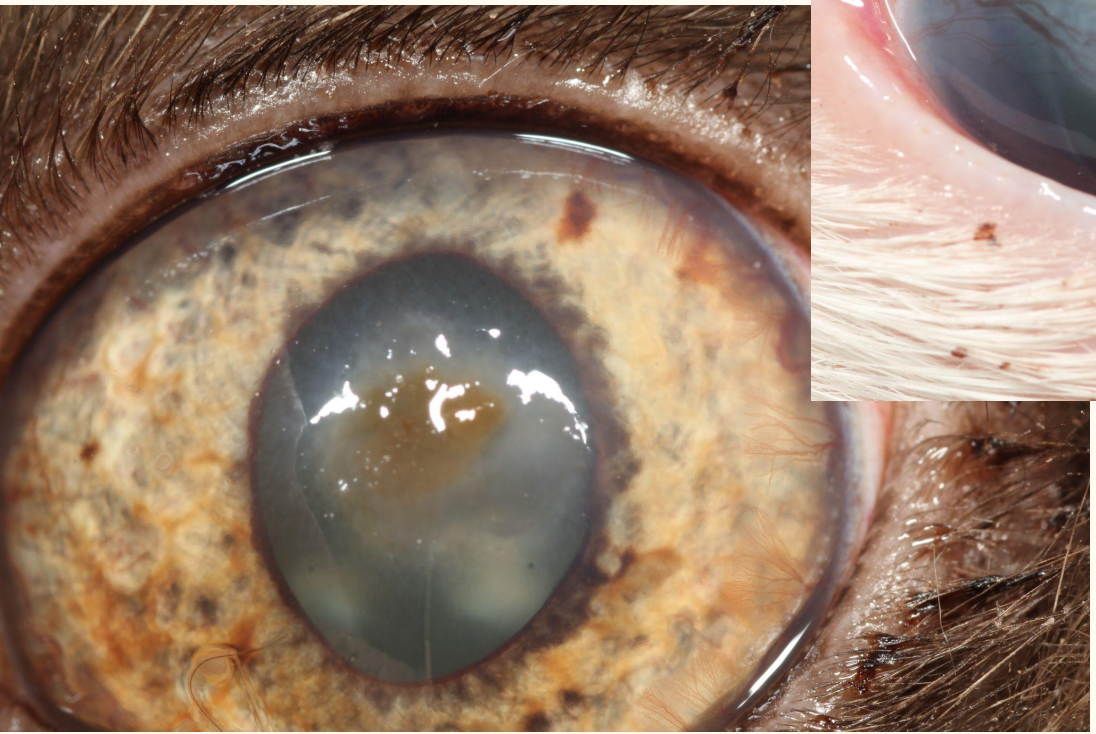
- Start as superficial dendritic ulcer then can become larger (geographic ulcer)
- Topical antivirals and antibiotics



Corneal sequestrum

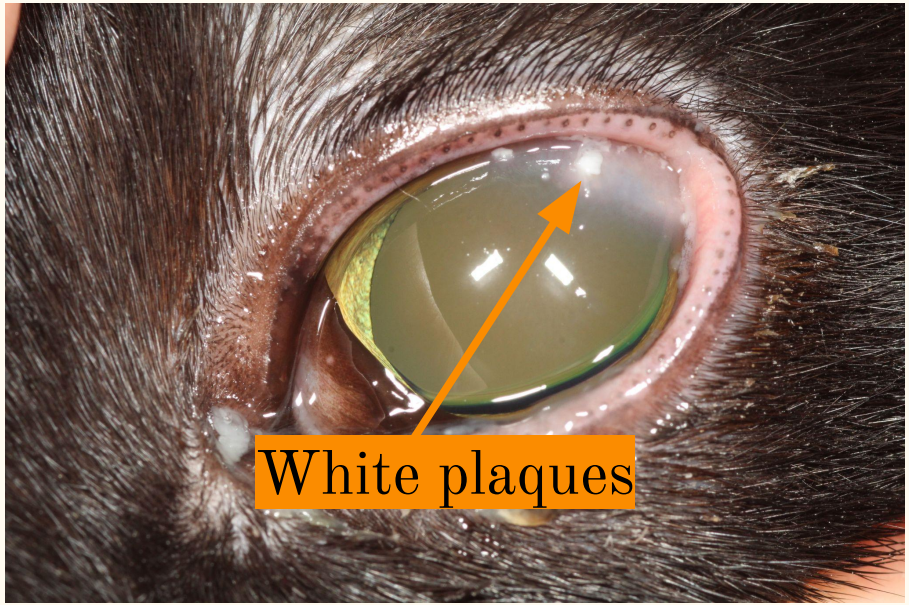
- Usually comfortable unless concurrent ulceration
- Conservative management by allowing neovascularization to develop and sequestrum to slough
- Surgical treatment with debridement– since cannot determine depth, can be risky

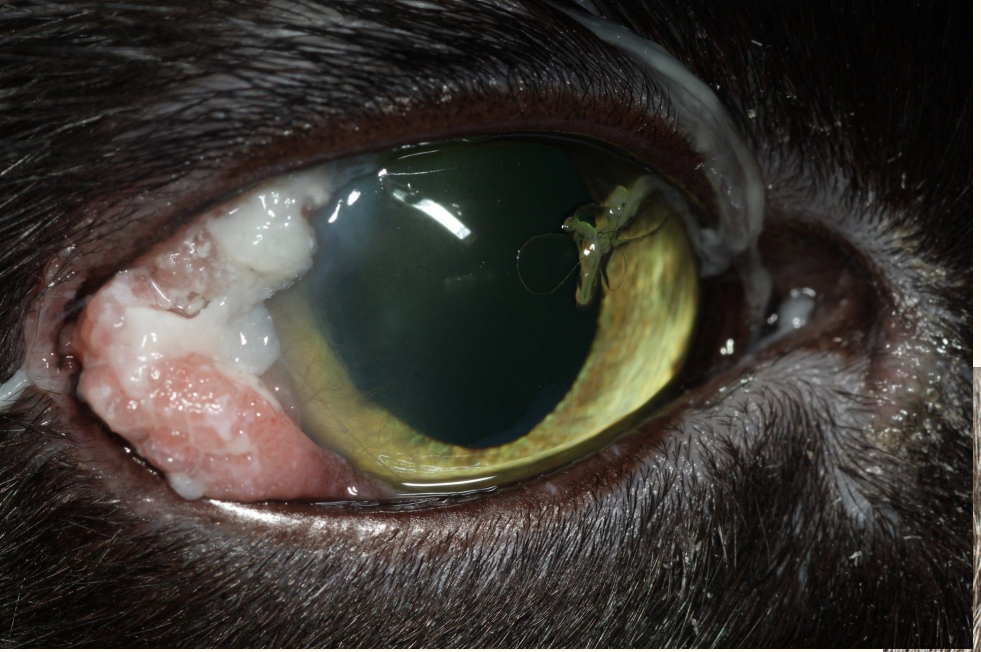




Eosinophilic keratitis

- Associated with herpesvirus, although unclear how
- Classic appearance of white “cheese curd” proliferative tissue
- Use cytology to dx
- Treatment is topical immunosuppressive medication, often needed for life





Treatment

- Dependent on severity
- Systemic illness
- Primary infection as kitten
- Chronicity
- Presence of ulcer or severe conjunctivitis

Antivirals

1. Cidofovir - topical, expensive, needs to be compounded
2. Famciclovir - oral, inexpensive, large pill, available at human pharmacy
3. Ganciclovir - topical, expensive, needs to be compounded, short shelf life
4. Idoxuridine - topical, needs to be compounded, frequent dosing (at least 4x daily)
5. Trifluridine - topical, inexpensive, available at human pharmacy, frequent dosing

Antivirals

1. Cidofovir 0.5% ophthalmic
   - 1 drop BID for at least 2 weeks

2. Famciclovir PO
   - 40-90mg/kg BID
   - Success with 125mg/cat BID

Antibiotics

1. Ophthalmic fluoroquinolone (Moxifloxacin, Ofloxacin)
2. Tobramycin -
    - BID usually sufficient for prophylaxis

3. +/- Oral antibiotics in cases of concurrent upper respiratory signs

Journal of Feline Medicine and Surgery

▸ J Feline Med Surg. 2017 Feb 6;13(10):744–751. doi: 10.1016/j.jfms.2011.06.007

Anaphylactic Events Observed within 4 h of Ocular Application of an Antibiotic-Containing Ophthalmic Preparation: 61 Cats (1993–2010)

Karen M Hume-Smith [1,a], Allyson D Groth [1], Mark Rishniw [3], Linda A Walter-Grimm [4], Signe J Plunkett [5], David J Maggs [2,*]

widely. Most were healthy (87%) prior to anaphylaxis. Ophthalmic antibiotics commonly were administered for conjunctival (65%) or corneal (11%) disease, or ocular lubrication (7%) and contained bacitracin, neomycin, and polymyxin B (44%), or oxytetracycline and polymyxin B (21%). Polymyxin B was present in all cases. Vaccines or other drugs were also administered to 51% of cats. In 56% cases, anaphylaxis occurred within 10 min of drug

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Anti-inflammatory medications

1. Prednisolone acetate 1% - usually BID to start then taper for chronic use
2. Dexamethasone drops (*not NeoPolyDex!)*
3. Cyclosporine (can use Optimmune)
4. If refractory to all options, megestrol acetate

Lysine?

Effect of oral administration of L-lysine on conjunctivitis caused by feline herpesvirus in cats

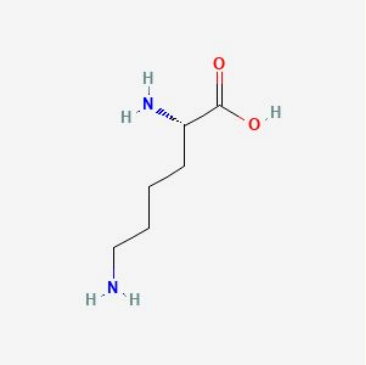
Jean Stiles, DVM, MS; Wendy M. Townsend, DVM; Quinton R. Rogers, PhD; Sheryl G. Krohne, DVM, MS

Conclusions and Clinical Relevance—Oral administration of 500 mg of lysine to cats was well tolerated and resulted in less severe manifestations of conjunctivitis caused by FHV-1, compared with cats that received placebo. Oral administration of lysine may be helpful in early treatment for FHV-1 infection by lessening the severity of disease. (*Am J Vet Res* 2002;63:99–103)

Efficacy of oral supplementation with L-lysine in cats latently infected with feline herpesvirus

David J. Maggs, BVSc; Mark P. Nasisse, DVM; Philip H. Kass, DVM, PhD

Conclusions and Clinical Relevance—Once daily oral administration of 400 mg of L-lysine to cats latently infected with FHV-1 was associated with reduced viral shedding following changes in housing and husbandry but not following corticosteroid administration. This dose caused a significant but short-term increase in plasma L-lysine concentration without altering plasma arginine concentration or inducing adverse clinical effects. (*Am J Vet Res* 2003;64:37–42)



Bol and Bunnik *BMC Veterinary Research* (2015) 11:284
DOI 10.1186/s12917-015-0594-3

BMC Veterinary Research

RESEARCH ARTICLE Open Access

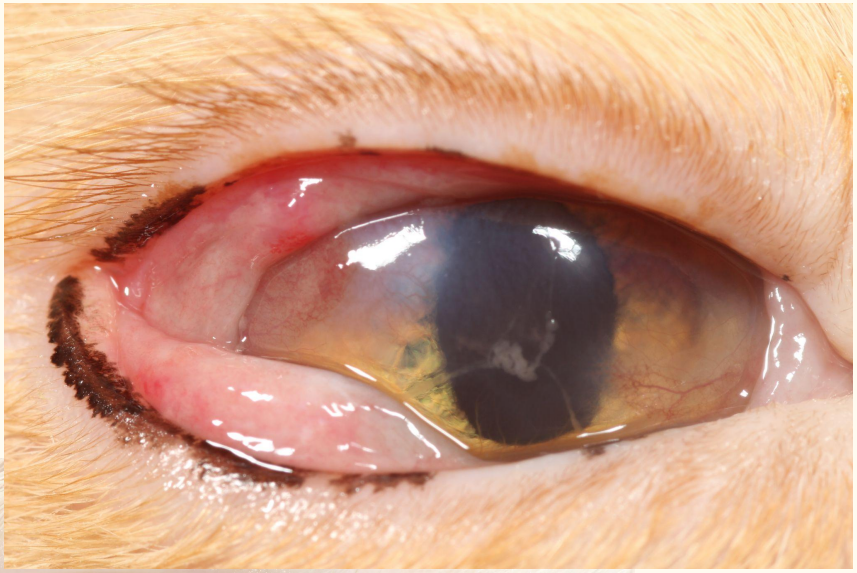
Lysine supplementation is not effective for the prevention or treatment of feline herpesvirus 1 infection in cats: a systematic review

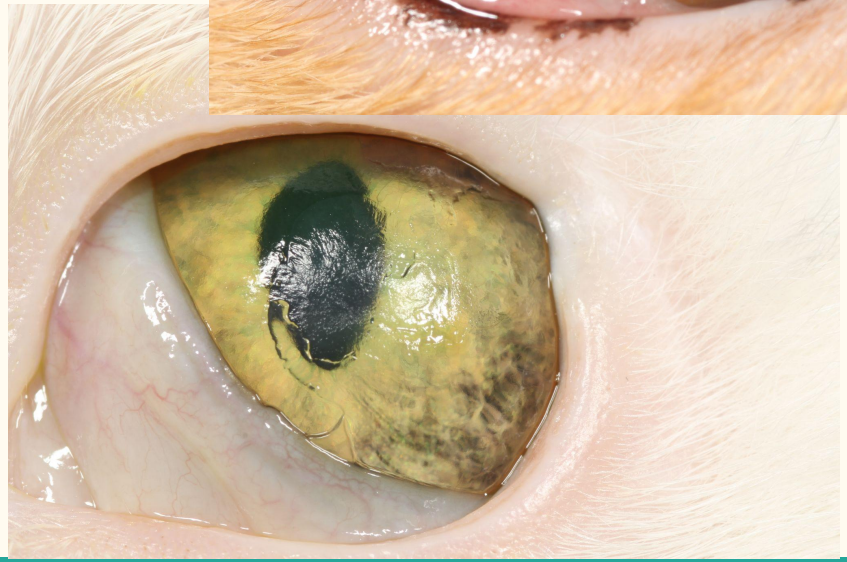
Sebastiaan Bol[1*] and Evelien M. Bunnik[2]

Conclusion: We recommend an immediate stop of lysine supplementation because of the complete lack of any scientific evidence for its efficacy.

More complex cases?

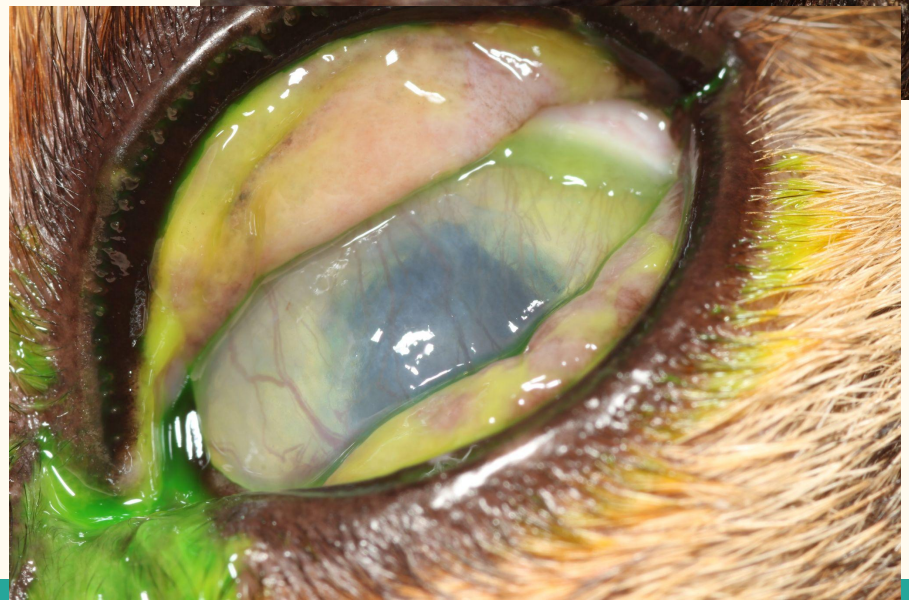
- Primary FHV-1 infection
- Non-healing (indolent) corneal ulcer
- Eosinophilic keratitis with concurrent squinting
- Treatment failures





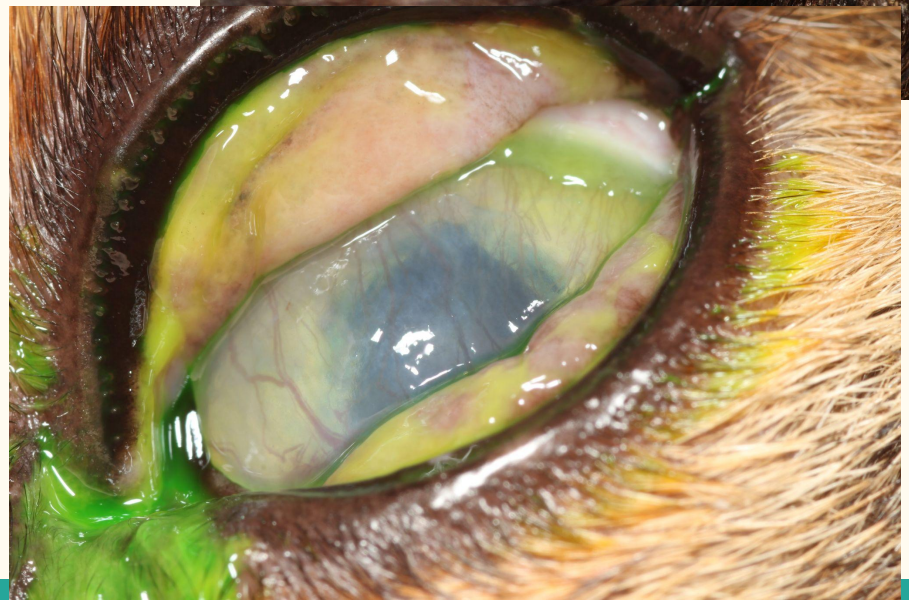
Primary FHV-1 infection?

- Fever, lethargy, inappetence, upper respiratory signs, nasal discharge
- Severe conjunctivitis, chemosis, serous to mucopurulent discharge, corneal and/or conjunctival ulceration



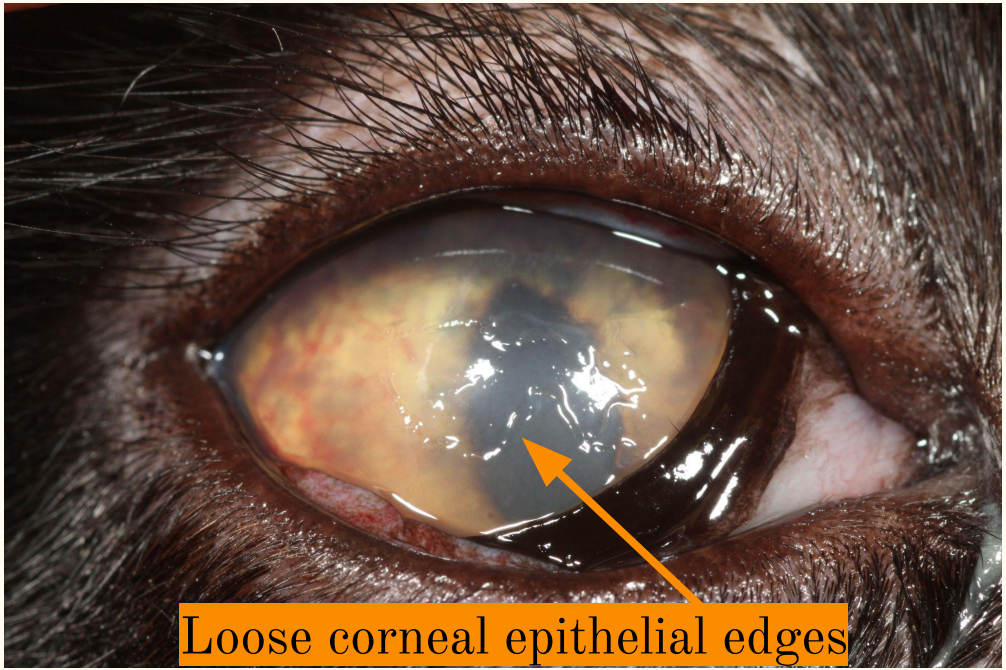
Primary FHV-1 infection?

- Antivirals given lack of immunity
- Prevent/treat secondary bacterial infection
- Reduce risk of development of symblepharon
- Systemic meds PRN



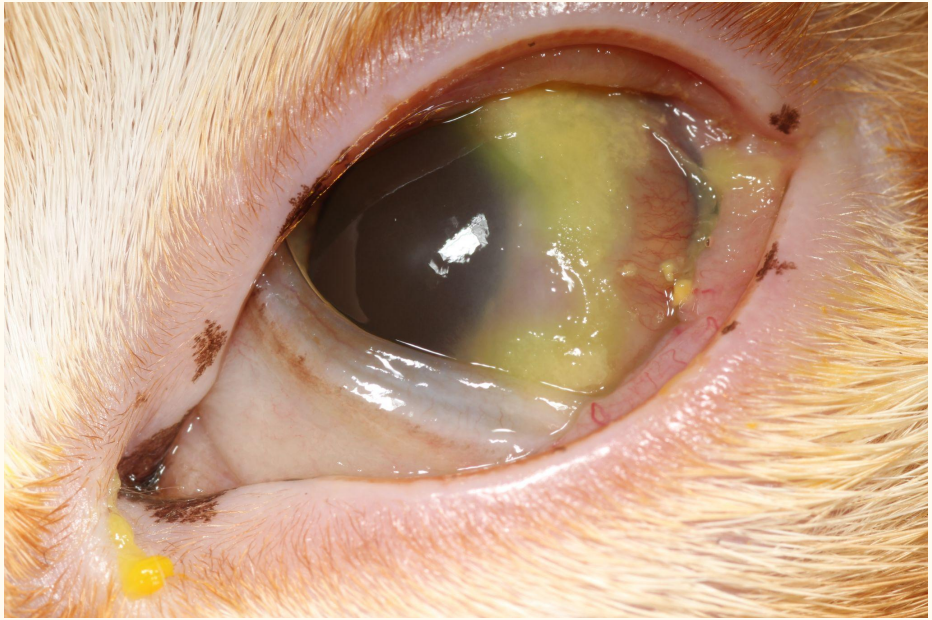
Non-healing corneal ulcer?

- Dendritic/geographic ulcer may develop nonadherent epithelium
- Consider debridement
  - Ensure no loss of depth
  - Numb cornea with proparacaine
  - Sterile cotton-tipped applicator
- Even with debridement, can take 2-4 weeks to heal



EK with squinting?

- Painful eye with increased discharge along with changes consistent with EK
- Treat ulcer first – usually 2-4 weeks for to heal
- Then can start immunosuppressives once healed



Treatment failures?

- Multiple strains of virus
- Not all strains are cross-protective, have same drug susceptibility, or produce different disease manifestations
- Additionally, individual variations in immunity, coinfection with other viruses or bacteria may modify the course of disease
- Maybe wasn’t herpes all along!

Questions?