Ocular Manifestations of Feline Herpesvirus-1
Feline Herpesvirus – 1

- Feline viral rhinotracheitis
- Widespread infection - highly contagious
- Spread via oronasal/conjunctiva - direct and indirect
- Infected as MDA wanes (8-12 weeks)
- Vaccines only partially protective
Viral Features

- Latency: trigeminal ganglion, + cornea + skin
- Recrudescence - immunosuppression: stress, glucocorticoids, cyclosporine, FeLV, FIV etc.
- Recrudescence vs persistent low level replication
- Epitheliotoxic virus - conjunctiva*, cornea, nasal + oral mucous membranes, dermis - cytolysis of infected cells
Clinical signs

• Sneezing
• Nasal/ocular discharge
• Blepharospasm
• Chemosis/hyperemia
• Inappetance
• Lethargy

https://en.wikipedia.org/wiki/Feline_viral_rhinotracheitis
Diagnosis

- Presumptive
- **Co-infections common**
- Pathognomonic - dendritic ulcers
- IDEXX Feline Upper Respiratory Disease PCR Panel - Mycoplasma, Chlamydophila, Bordetella, Herpes?
- Other molecular methods - rarely used

https://veteriankey.com/cornea/
Herpesvirus Specific Treatments

- Cidofovir 0.5% ophthalmic solution - BID
- Famciclovir 90mg/kg BID PO - plasma and tears - may clear persistent low level infection
- Ganciclovir?
- Redundant - trifluridine, idoxuridine, vidarabine etc.
- L-lysine? Immune enhancing probiotics?
- Reduction of stress
Cidofovir

- Inhibits viral replication - effective
- Safe, well tolerated
- Long acting - BID dosing
- Compounding pharmacies
- 6 months shelf life
- Reasonable priced

Effect of topical ophthalmic application of cidofovir on experimentally induced primary ocular feline herpesvirus-1 infection in cats

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Famciclovir

- Inhibits viral replication
- Tablets (125mg, 250mg, 500mg)
- Safe
- Well-tolerated - GI side effects, renal disease?
- Easily available
- 90mg/kg BID PO - plasma and tears
- May clear persistent infection?

Thomasy et al. JAVMA 2016
Conjunctivitis

- Most common manifestation
- Primary vs recurrent
- Uni/bilateral
- Hyperemia, chemosis, epiphora, blepharospasm
- +_conjunctival ulcers
- Usually self-limiting
- Co-infections?
- Supportive care - lubricant
- Treatment if painful, severe, co-infection
Conjunctival Cytology

• Inclusion bodies:
  - Intranuclear herpes (rare, need special stain)
  - Intracytoplasmic (Mycoplasma, Chlamydia)

• Cellular infiltrate -
  - Neutrophilic (herpes)

Neutrophilic Conjunctivitis - Herpes

Treatment of Co-infections

- **Mycoplasma and Chlamydia** -
  - Doxycycline 10mg/kg PO SID - 4 weeks
  - Terramycin/Erythromycin TID

- **Calicivirus** - RNA virus
  - Antivirals don’t work, supportive care
Ulcerative Keratitis

• 2nd most common manifestation
• Primary infection or recrudescence
• Epitheliotoxic virus
• Dendritic, geographic ulcer - superficial
• Stromal involvement - secondary bacterial infection
• Fluorescein +_ Rose Bengal
FHV-1 Ulcerative Keratitis Treatment

- Topical antibiotics +_serum
- Atropine
- NSAID/gabapentin
- Cidofovir 0.5% BID/Famciclovir 90mg/kg BID - 1 week past resolution of CS
- +_E-collar
Non-Healing Corneal Ulcer

- Indolent”
- Debride loose edges with CTA - repeatable
- Diamond burr
- **GRID KERATOTOMY CONTRAINDICATED IN CATS**
- Superficial Keratectomy

Loose edges
KCS

- Exact pathogenesis unknown
- Clinical signs milder than in dogs
  - Conjunctival hyperemia, lacklustre cornea, recurrent ulcers
- Lubricant
- Tacrolimus - corneal health
- PDT
Symblepharon

- Sequela to primary disease
- Conjunctiva - conjunctiva (bulbar, palpebral, TEL)
- Conjunctiva - cornea
- Surgical correction - recurrence frequent, amnion?
- Prevention - lubrication/ separation
Stromal Keratitis

• Uncommon
• Steroid use may predispose
• Immune-mediated disease – suspect delayed hypersensitivity to virus in cornea
• Fibrosis, oedema, cellular infiltrate, (stromal) neovascularisation
• Non-painful
• Vision-threatening

Andrew JFMS 2001

http://www.abcdcatsvets.org/feline-herpesvirus/
http://www.cliniciansbrief.com/article/conjunctivitis-cats
Stromal Keratitis Treatment

- Immunosuppression/modulation - topical steroids, cyclosporine
- Antiviral
Eosinophilic Keratoconjunctivitis

- Role unclear - immune-mediated
- Cornea and conjunctiva
- White/pink, raised tissue extending across cornea
- Vision-loss/discomfort as progresses
- +_Fluorescein + over tissue

http://mspca.createconquer.com/angell_services/feline-eosinophilic-keratitis/
Diagnosis - Cytology

- Single eosinophil!!

Epithelial cells, neutrophils, eosinophils, mast cells
Treatment – Eosinophilic Keratoconjunctivitis

- Topical steroid (dex) + anti-viral
- Optimmune (0.2% CSA) + topical NSAID
- 1% CSA
- Topical 0.5% megesterol acetate
- Systemic anti-inflammatories - triamcinolone, prednisolone
- **Slow taper to lowest dose that controls clinical signs** - recurrence common

Use of an ophthalmic formulation of megestrol acetate for the treatment of eosinophilic keratitis in cats

Jean Stiles* and Martin Coster†
Corneal Sequestra

- DSH
- Predisposing factors - steroids, chronic irritation (ulcer etc)
- Pathogenesis unclear
- +_pain
- +_ulcer around
- Can increase in size and depth

Andrew JFMS 2001
Treatment – Corneal Sequestra

• Active monitoring – supportive
• Treat ulcer if present
• Diamond burr removal
• Surgical excision +_ grafting procedure
• Recurrence

Use of cyanoacrylate adhesive in the surgical management of feline corneal sequestrum: 16 cases (2011-2018)

Stephanie A. Pumphrey  |  Sujata J. Desai  |  Stefano Pizzirani
Dermatitis/Blepharitis

- Ulcerative dermatitis: periocular, facial, trunk, distal extremities
- Pruritic
- Famciclovir 90mg/kg BID

https://dermvettacoma.com/feline-herpes-virus-dermatitis/
Canine Herpesvirus–Emerging Pathogen?

- First case at ISU
- Bilateral, painful, non-resolving conjunctivitis
- Dendritic ulcers!
- Ganciclovir, Idoxuridine, Cidofovir?

Outbreak of ocular disease associated with naturally-acquired canine herpesvirus-1 infection in a closed domestic dog colony

Eric C. Ledbetter, Sung G. Kim, Edward J. Dubovi
References

References
