

Keratoconjunctivitis—not just low STT

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Causes of keratoconjunctivitis in canine and feline patients will be reviewed along with diagnostic and treatment strategies. This will include discussion of tear film deficiencies, as well as infectious and noninfectious causes of keratoconjunctivitis.

Learning Objectives

- Review examination and diagnostic approach for keratoconjunctivitis in dogs and cats
- Review common causes of keratoconjunctivitis in dogs and cats with associated treatment strategies
- Review client education and communication strategies to maximize successful treatment

Determining best treatment strategy for conjunctivitis or keratoconjunctivitis in canine and feline patients starts with collecting initial database for any ophthalmic complaint.

- History
 - What's happening?
 - tearing, squinting, redness, other discharge, cloudiness [where]
 - how severe relative to signs present at time of exam (do owners have photos of normal days and bad days to review?)
 - both eyes, one eye
 - When is it happening?
 - for how long—days, weeks, months,
 - recurring?
 - If so, how frequent and for what duration? Any associations the owners have made with recurrence (time of year, before travel, when previous medications stopped or decreased...)
 - Is it always the same eye (or both eyes) affected?
 - What if any treatments have been tried in the past (including any owners have done on their own or any other veterinarians at same or different facility)?
 - Signalment, lifestyle (indoor/outdoor), purpose, exposures (travel, boarding, new pet), vaccination and preventative status of pet, other signs of illness or changes (weight loss, PU/PD, decreased appetite)
- Exam
 - Is the animal painful?
 - Squinting, tearing/discharge, third eyelid elevation, head-shy/hyperesthetic
 - Is the animal visual?
 - Menace, dazzle, direct AND indirect PLR, cotton-ball drop test
 - Evaluate each eye independently; may need to reassess after topical anesthetic (get STT first—if there isn't a deep hole in the eye; at least get in the contralateral eye) and/or systemic analgesic depending on pain level
 - Is there a hole in the eye?
 - If no deep ulcer, safe to proceed with STT, IOP, fluorescein stain; consider if other sampling for cytology/culture/PCR indicated
 - Can the animal completely close the eye(s)?
 - Is there hair touching the eyes? Is entropion present?

- STT
 - Any patient with red, uncomfortable eye, even if visible tearing/discharge as long as there is no deep corneal ulcer/rupture (if there is, and concern about (re)rupture with STT measurement, try to get STT of contralateral eye)
 - Yes, even cats
 - STT may be technically normal but still inappropriately low for patient's signalment or degree of inflammation—if so, patient has a tear film deficiency that needs treatment
- IOP
 - Any patient with red, uncomfortable eye, even if visible tearing/discharge as long as there is no deep corneal ulcer/rupture (if there is, and concern about (re)rupture, try to get IOP of contralateral eye)
 - Avoid pressure on neck; if painful or using applanation, get after
 - Are pressures “normal”/appropriate for signalment, are they symmetric (<5 mmHg difference between two eyes), do they make sense with visual status of patient/remaining exam findings?
- Fluorescein stain
 - Ulcer or no ulcer? On cornea? On conjunctiva?
 - Adherent to goop/debris on cornea?—tear film deficiency
- Ophthalmic Exam
 - Is inside of eye visible? If so, is it normal? If not, what is obstructing visualization?
 - Think about what you can see (what is visible and abnormal and what is visible and normal) and what you can't see that you normally can
- Physical Exam
 - Other signs of illness? Acute/chronic respiratory signs? Weight loss? PU/PD? Endocrine signs? Generalized allergies? Dental disease? Otitis? Dry nose with crusty discharge ipsilateral to eye signs?

Canine Conjunctivitis and Keratoconjunctivitis

While there are many causes of canine conjunctivitis and keratoconjunctivitis, by far the most common that can result in vision and globe threatening complications without appropriate treatment are types of tear film deficiency. Recognition and treatment of qualitative, quantitative, neurogenic, neurotropic and neuroparalytic keratoconjunctivitis sicca will be discussed. Other causes of conjunctivitis/keratoconjunctivitis including follicular conjunctivitis, canine herpesvirus, pigmentary keratitis, chronic superficial keratitis/pannus, and allergic conjunctivitis which are also often associated with tear film deficiency.

Feline Conjunctivitis and Keratoconjunctivitis

Most common causes of feline infectious (kerato)conjunctivitis including FHV1, *Chlamydia spp.*, *Mycoplasma spp.*, calicivirus, and *Bordetella bronchiseptica* and will be reviewed with information on diagnosis and treatment. Evaluation of feline tear film and management of tear film deficiency will be discussed. Eosinophilic keratitis/conjunctivitis, epitheliotropic mastocytic conjunctivitis, and lipogranulomatous conjunctivitis will also be discussed.

When it's not (primarily) conjunctivitis...other differentials to consider

- Nasolacrimal drainage problems
 - Unilateral epiphora with no inflammation?

- Since birth or acquisition at young age
 - Imperforate or micropuncta
 - Nasal trichiasis
 - Medial canthal conformation
 - Symblepharon
 - Scar tissue/dacryostenosis/symblepharon (history of previous conjunctivitis)
 - Dental disease
 - Mass
 - Unilateral and inflamed?
 - Dacryocystitis
 - Dental disease
 - NL foreign body
 - Primary nasal disease (fungal rhinitis? mass?)
 - Mass
- Neoplasia
 - Primary conjunctival neoplasia or manifestation of systemic neoplasia
- Horner's Syndrome
 - Nonpainful, visual, ptosis, miosis, enophthalmos, third eyelid elevation, hyperemia; normal intraocular exam with exception of miosis
 - Symmetric, normal STT and IOP (consider signalment, temperament and tonometer), fluorescein negative
 - Diagnostics—otoscopic examination, screening thoracic radiographs, CBC/Chem/T4, phenylephrine testing, ophthalmology referral if not fully able to rule out uveitis, neurology referral versus monitoring if only neuro signs; harness
- Uveitis
 - Treat ocular inflammation symptomatically while screening for systemic associated disease (infection, neoplasia)
 - Monitor for secondary glaucoma
- Glaucoma
 - Start topical antiglaucoma therapy and systemic analgesics; if inflamed, anti-inflammatory therapy
 - Consider systemic diagnostics for underlying causes of uveitis if suspect secondary glaucoma

Tips:

- Check STT, IOP, fluorescein at first examination for ocular complaint unless specifically contraindicated; educate staff to educate clients on eye examination policy (time and costs for exam with baseline diagnostics) when scheduling
- Plan to recheck even if doing well per owner and reassess STT, IOP and fluorescein stain at recheck. Consider recheck while still on therapy and after discontinuation if discontinuation planned.
- Evaluate vision in each eye independently at every exam
 - This can be done even if you cannot see the pupil in patient with diffuse corneal opacity (menace, dazzle, contralateral PLR, cottonball tracking can all still be evaluated without direct visualization of the pupil)
- Allergies don't only (consistently) affect one eye* and rarely present as only conjunctivitis—think of them as the last possibility on the differential list not the first

- *unless contact allergy to something applied topically to only one eye which will usually have associated blepharitis
- Recurrent squinting/discomfort in one eye in young dog that is visual with normal intraocular examination, conjunctivitis, keratitis +/- recurrent ulceration—think physical irritant (**ectopic cilia** or entropion), or less common, congenital KCS
- If STT similar or lower to contralateral unaffected eye in patient with unilateral (kerato)conjunctivitis—patient is tear deficient and (especially if middle aged to older canine and/or brachycephalic canine) likely has primary KCS masked by inflammation
- If STT is at the low end of normal in one or both eyes in brachycephalic canine with (kerato)conjunctivitis, it has KCS
- Recurrent keratoconjunctivitis with ulceration in adult cat—think FHV1
 - Cats with chronic, recurrent, severe FHV1 likely have secondary tear film deficiency
 - Treat chronic, recurrent viral infection with appropriate antiviral medication
- Persistent nonulcerative keratoconjunctivitis with plaques in adult cat with minimal/no blepharospasm—cytology to look for eosinophilic keratitis

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