

VET 433A Lacrimal

*Understand the pathogenesis of dry eye disease in the dog, underlying causes and treatments

Tear Film

- Lipid layer
 - Made by meibomian glands
 - Helps prevent tear film evaporation
 - Provides tear film quality
- Aqueous layer
 - Made by the lacrimal gland and third-eyelid gland
 - Provides nutrition, immune defense
- Mucin Layer
 - Made by goblet cells in conjunctiva
 - Anchor tear film
 - Collection of pathogens

Innervation of the lacrimal gland

- Sensory: CN V
- Parasympathetic: CN VII until pterygopalatine ganglion CN V via lacrimal nerve
- *Facial paralysis/otitis interna can impact these nerves and lead to neurogenic KCS

Testing

- Schirmer tear test: Measures the aqueous component of tears (basal and reflex tear production)
 - Place in lower lateral 1/3 of the conjunctival fornix and measure the mm of wetting over 1 min
- Tear Film Breakup time (TFBUT)
 - Measures qualitative factors and assesses the stability of the tear film

Keratoconjunctivitis Sicca (KCS)

- Quantitative tear deficiency
- Reduced aqueous tear production
- Clinical features
 - Mucoïd discharge
 - Blepharospasm
 - Conjunctival hyperemia
 - Conjunctival chemosis
 - Corneal vascularization
 - Corneal melanosis

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- Lackluster cornea
- Causes
 - Immune mediated *most common cause, breed predispositions
 - Neurogenic *CN V or VII disease
 - Endocrine disease: Diabetes mellitus, hyperadrenocorticism, hypothyroidism
 - Trauma
 - Infectious disease: lacrimal adenitis, canine distemper
 - Drug/Toxin induced: sulfa-derivatives, atropine, anesthesia/sedation
 - Congenital
 - Iatrogenic: Excision of the gland of the third eyelid
- Diagnostics
 - History
 - Clinical Signs
 - STT
- Treatment
 - Immunomodulating agents
 - Cyclosporine (Optimmune 0.2%, 0.5-2%)
 - Tacrolimus (0.02-0.23%)
 - Frequency q8-12h
 - Topical tear replacement
 - Many commercially available
 - Viscous solutions and gels
 - Preference for higher amount of hyaluronate
 - Antibiotic/Steroid Therapy
 - Only if there is NOT an ulcer present
 - Neomycin/PolymyxinB/Dexamethasone
 - Surgery
 - Parotid duct transposition
 - Salvage procedure because saliva is not equivalent to tears

Qualitative Tear Deficiency

Mucin Deficiency	Lipid Deficiency
Decreased goblet cells Results from chronic conjunctival inflammation Feline herpesvirus 1 FHV-1	Chronic Blepharitis and meibomitis Chemical burns Severe eyelid cicatrization
Dx History, Clinical Signs, Eyelid exam STT TFBUT Meibometry	Dx History, Clinical Signs, Eyelid exam STT TFBUT Meibometry
Treat underlying cause	Treat underlying cause

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Medial therapy: Immunomodulatory Topical tear replacement	Medical therapy Topical ointment therapy Additional therapy> warm compress q8-12h
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Nasal Lacrimal Duct Flow

Lacrimal punctum > Canaliculus > Lacrimal sac > Nasolacrimal duct > Nasal or accessory punctum

Obstruction of the Nasal Lacrimal Duct

- Clinical signs
 - Variable depending on the severity of the obstruction
 - Chronic epiphora
 - Mucopurulent discharge
 - Medial canthal swelling
 - Difficult to flush the NLD
- Examination
 - Focus on lacrimal puncta
- Diagnostic
 - Jones test
 - Assess patency with a nasolacrimal flush *good idea to sedate prior to this*
- Pathogenesis and treatment
 - Developmental > surgical opening
 - Foreign body obstruction > flushing and stenting
 - Inflammatory: Flushing and stenting
- Medical management
 - Topical abx/steroids
 - Oral NSAIDS, Abx
 - Treatment duration is about 4-6 weeks

Third eyelid Gland

- Functions
 - Protect globe
 - Secretion of tears
 - Distribution of tears over the surface of the globe
 - Removal of particulate material from ocular surface
- Prolapsed gland of the third eyelid
 - Cause
 - Weakness of connective tissue anchoring gland to ventral periorbital tissue
 - Breed predisposition

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- English Bulldog
- Giant breeds (Great Danes)
- Beagles
- Diagnosis
 - History
 - Signalment
 - Clinical signs
- Problem
 - Inflamed gland from chronic exposure
 - Reduced aqueous tear production
 - Don't cut this gland out! > Iatrogenic KCS
- Treatment
 - Surgical replacement of TEL gland