



## **OPHTHALMOLOGY:**

### **Keratoconjunctivitis sicca (KCS)**

#### **Definition**

Keratoconjunctivitis sicca (KCS) or “dry eye” is a deficiency in the aqueous portion of the precorneal tear film, which is produced by the lacrimal gland and the gland of the third eyelid. This is a very common disorder in dogs and the incidence has been reported as 1% of all canine patients. The most common cause of this disorder in dogs is immune-mediated. Breeds that are predisposed to this are the American Cocker Spaniel, Bloodhound, Boston Terrier, Cavalier King Charles Spaniel, English Bulldog, English Springer Spaniel, Lhasa Apso, Miniature Schnauzer, Pekingese, Poodle, Pug, Samoyed, Shih Tzu, West Highland White Terrier, and Yorkshire Terrier. Other common causes include drug-induced (from etodolac and sulfa-antibiotics), surgically induced (with a median occurrence time of 4.5 years after removal of the prolapsed gland of the nictitans), neurogenic, traumatic, and radiation induced. Congenital KCS also occurs, particularly in Pugs, Chihuahuas, and Yorkshire Terriers.

#### **Clinical Signs**

The clinical signs of KCS include a thick mucoid to mucopurulent ocular discharge, a dull appearance to the corneal surface, blepharospasm, corneal vascularization and pigmentation, as well as chronic blepharitis. Corneal ulcers are common, especially in severe or acute cases. A dry ipsilateral nare is a common finding in neurogenic forms of KCS due to impaired innervation of the lateral nasal gland as well as the lacrimal gland.

#### **Diagnosis**

The diagnosis of KCS is made by the history, clinical signs, and the Schirmer Tear Test (STT). This test is performed by placing a standardized STT strip into the ventrotemporal conjunctival cul-de-sac for 60 seconds. The wicking of the tears down the strip is then measured. KCS should be suspected in cases where the STT is chronically below 15 mm/min or below 10 mm/min with clinical signs of KCS. This test should be performed prior to placing any medications in the eyes as this may affect the outcome of the test. KCS should be distinguished from other causes of corneal disease such as exposure keratitis in brachycephalic dogs and dogs with facial nerve palsies as well as dogs with qualitative tear film deficiencies due to decreases in the lipid or mucin portion of the precorneal tear film.

#### **Treatment**

Medical treatment is aimed at increasing tear production, lubricating the cornea until tear production is improved, decreasing corneal and conjunctival inflammation, controlling bacterial overgrowth, and keeping the eyes free of excess mucous. There have been several important advances in the medical treatment of KCS. Most veterinarians are aware of cyclosporine. This is a T-helper cell suppressor which decreases corneal inflammation and increases tear production by a mechanism which is unclear at this time. This drug has been the mainstay of KCS treatment. More recently, the drug tacrolimus, which has a mechanism of action similar to cyclosporine only much more potent, has been used. Some dogs that do not respond to cyclosporine may respond to this drug. An antibiotic/steroid combination will often be used initially to help decrease corneal inflammation and to control bacterial overgrowth unless corneal ulceration is present. Advancement in the treatment of this disorder has been the development of new long-lasting artificial tear replacements. The older tear replacers that contain polyvinyl alcohol are too thin and have very short contact times making them of little use in canine KCS. Newer gel formulations that contain methylcellulose, such as Genteal Gel and Refresh Liquigel, have much longer contact times and have been important

medications for keeping the corneas lubricated in dogs that do not respond to lacrimomimetic drugs. Finally, it is important to keep the eyes free of the thick, mucoid discharge. This can be performed by flushing the eyes with a saline eye wash. If the mucous is particularly bad, a mucolytic such as acetylcysteine may be used. These advancements in the medical treatment of KCS have virtually eliminated the need for parotid duct transpositions.

## **Prognosis**

KCS generally requires life-long medical treatment on the part of the owner and they should be made aware of this, however, if caught early and treated appropriately, almost all cases of KCS can be controlled with medical treatment.

## **Ophthalmology Clinicians**

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MVS ophthalmology staff serve as an extension of your practice. Our diplomates have years of additional training beyond a DVM degree and have been board-certified by the American College of Veterinary Ophthalmology to assure competency in advanced veterinary ophthalmology.

## **Questions?**

Our ophthalmologists are available for questions and consultations on medical conditions. They are also on-call for consultation on cases seen through the emergency service 24/7.

## **LOCATIONS**

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**Additional locations for consultation include: Grand Rapids, Toledo, Ann Arbor and Grayling.**