

# Keratoconjunctivitis Sicca (KCS, Dry Eye)



## BASIC INFORMATION

### Description

Keratoconjunctivitis sicca (KCS) is the Latin term for *dry eye*. KCS usually arises from inadequate production of watery tears.

Blockage of the tear ducts is not often involved. There are two major tear glands in animals, one beneath the upper eyelid and one that resides on the back side of the third eyelid.

### Causes

Potential causes in dogs include the following:

- Dry eye often arises from an immune-mediated inflammation of the tear glands and is common in the American cocker spaniel, English bulldog, Lhasa apso, shih tzu, West Highland white terrier, Cavalier King Charles spaniel, and others.
- Removal of a prolapsed gland of the third eyelid can cause KCS, often years later.
- Certain drugs are toxic to the tear glands, including sulfa drugs, etodolac, 5-aminosalicylic acid, and others.
- Canine distemper virus infection can cause KCS.
- Neurogenic KCS is a rare disease in dogs in which the tear gland and membranes of the nostril on the same side are affected.
- Congenital underdevelopment of the tear glands can lead to KCS very early in life; this occurs most often in the Yorkshire terrier.

Potential causes in cats include the following:

- Feline herpesvirus infection may be the most common cause of dry eye in cats. Whether the tear glands are affected by the virus or the tear ducts become scarred and blocked by chronic conjunctivitis is unclear.
- Removal of a prolapsed gland of the third eyelid can also result in dry eye, but prolapsed glands are uncommon except in the Burmese.

Potential causes in both dogs and cats include the following:

- General anesthesia and use of topical atropine may cause decreased tear production, which is often temporary.
- Trauma, radiation therapy to the head, corneal ulceration, and proptosis of the globe may result in dry eye, usually on one side.
- Damage to the facial nerve, which activates the tear glands, can cause KCS and usually arises from chronic ear disease.

### **Clinical Signs**

Drying and inflammation of the surface tissues of the eye occur.

The conjunctiva and cornea become red and inflamed. The cornea may become pigmented and scarred, with decreased vision.

Corneal ulceration may occur. Mucus and oily secretions produced by glands of the eyelid and conjunctiva may build up and become infected (yellow-green in color). A classic sign of dry eye is thick ocular discharge.

If the onset of KCS is sudden, the eye is often painful (squinty). The nostril on the same side may be dry and filled with thick material, particularly in dogs with neurogenic KCS. The eyelids may be crusted over with discharge.

### **Diagnostic Tests**

KCS may be tentatively diagnosed based on clinical signs and confirmed by measurement of tear production using the Schirmer tear test. The tear test may be performed on more than one occasion, because the results can vary somewhat, especially in cats.

Other causes of conjunctivitis, keratitis, and thick discharge are ruled out with a thorough eye examination.

## **TREATMENT AND FOLLOW-UP**

### **Treatment Options**

The main goal is to increase tear production. Cyclosporine is commercially available as an ointment and can be obtained as a solution from compounding pharmacies. Ocular tacrolimus is also approved for use in the United States and is available from compounding pharmacies. Either of these drugs is administered 1-3 times daily, often indefinitely.

Pilocarpine applied to the food is usually tried in cases of neurogenic KCS. Tear production may increase within 3-4 weeks, but it can take as long as 12 weeks to see a response. Not all patients respond to these agents.

Another goal is to keep the eye well lubricated, and a variety of products manufactured for people and animals are available for this purpose. They include artificial tear solutions, gels, and ointments.

Topical anti-inflammatory agents and antibiotics may also be administered. For patients that do not respond to the tear stimulants and do poorly on lubricants alone, surgery to transplant a salivary duct up to the eye (parotid duct transposition) may be considered.

### **Follow-up Care**

Periodic rechecks, with repeated tear tests, are required for the life of the animal. Medications often need adjustment to maintain good surface health of the eye. Continuous and diligent treatment by the owner is key to managing this disease.

### **Prognosis**

KCS is usually a lifelong, chronic disease that may be controllable but is not often curable. Eyes that respond to tear stimulants have a good prognosis.