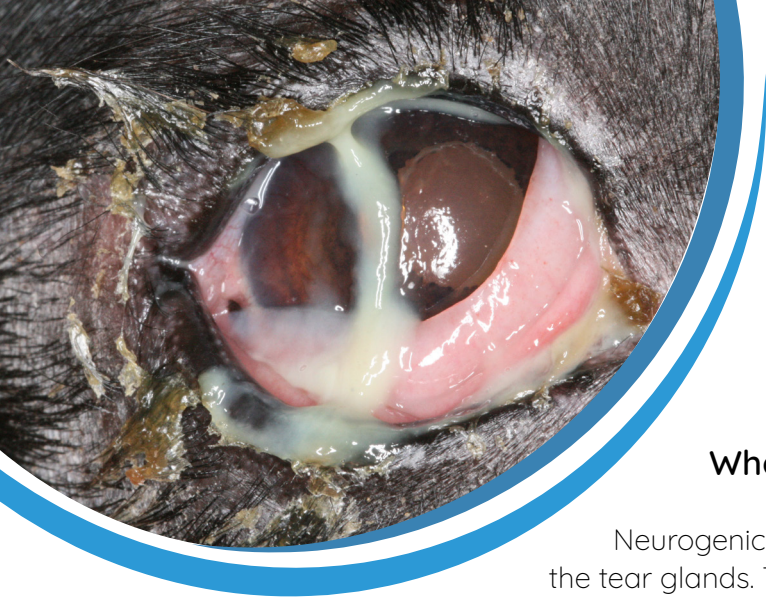


Neurogenic Dry Eye



What is neurogenic dry eye?

Neurogenic dry eye is caused by damage to the nerves that innervate the tear glands. Tears are essential to protect the eyes from external insults, like wind, dust and little foreign bodies that in normal conditions would be flushed away by the tears. Patients affected with neurogenic dry eye cannot produce tears and the eye becomes dry, cloudy and prone to corneal ulcers.

How does neurogenic dry eye present?

All forms of dry eye tend to have recurrent conjunctivitis, sticky discharge, pain and corneal ulcers. However, unlike in other causes of dry eye, most dogs with neurogenic dry eye also have a very dry and crusted nostril on the same side as the affected eye. This happens as the same nerve that supplies the tear gland also innervates a gland that moistens the inside of the nose. A dry nose can be painful and irritating to the patient so sneezing can also occur. More often than not only one eye is affected and the onset of the problem is very rapid. Neurogenic dry eye is very painful and if treatment is not given quickly, affected eyes might be lost.



On the left we have a dog with neurogenic dry eye, notice the dried and crusted nostril on the same side as the affected eye. On the right, a close-up view of an eye showing sticky yellow discharge. The cornea is no longer clear as blood vessels have grown in and clouded the eye.

Why has my dog developed neurogenic dry eye?

Most commonly, the cause of damage to the nerves to the tear gland cannot be found, even with extensive investigations such as X-ray, CT- or MRI scans of the brain. Occasionally, severe ear disease and/or previous ear treatments can induce neurogenic dry eye. In rare cases, the nerve can be damaged by infection or tumours.

How is neurogenic dry eye treated?

Unlike other forms of dry eye, neurogenic dry eye tends to show a poor response to drops or ointments usually used to stimulate tear production in the vast majority of dry eye patients.

The key treatment in managing neurogenic dry eye is the use of a drug called 'Pilocarpine'. This drug bypasses the damaged nerve and stimulates the gland directly, causing release of tears.

Pilocarpine acts on many parts of the body, including the gut where it encourages digestion. When prescribing pilocarpine, the challenge is that there is no standard dose of Pilocarpine across all patients. So, we need to titrate the drug slowly for each individual patient to the level where it works on the tear gland but does not stimulate the digestive system. Unfortunately, the dose of Pilocarpine that makes the tears flow in the eyes and the nose moist is very close to the dose where your pet may show signs of stomach upset. To avoid this happening, we will work closely together with you to find out the ideal dose of Pilocarpine for your pet.

Additional supportive treatments may be used as it can help to keep the eye less inflamed and reduce discharge. We may also use lubricant eye drops and antibiotic eye drops if appropriate. The dry nose will also require careful cleaning with damp cotton wool.

How to use Pilocarpine for neurogenic dry eye?

- Pilocarpine comes as an eye drop but it can be quite irritating to the eye, and as such we usually give it by mouth with food. In rare cases, where the drug is not tolerated by mouth, we use a dilute drop to the eye.
- We usually start with 2 drops twice daily in food, and then ask you to increase the dose by one drop every few days.
- The dose is increased until we see early signs that the drug is either working (the nose or the eye become moist again) or that your pet is showing side effects (nausea, salivation, vomiting or diarrhoea).
- If such side effects appear, we ask you to stop treatment with Pilocarpine for at least 24 hours (or until the side effects have resolved) and to contact us. We will then re-start treatment at the last lower dose once your pet is well again. Ex: if your dog was poorly on 8 drops twice daily, you stop treatment until your dog is well again, and then re-start at 7 drops twice daily.

How long is treatment for neurogenic dry eye continued?

If your dog has responded to the use of Pilocarpine eye drops, then we are likely to give a long course of this treatment before we see if we can withdraw the drops again. Some dogs may require life-long treatment.

What happens if my dog does not respond to medical treatment?

Unfortunately, neurogenic dry eye that does not respond to Pilocarpine is very hard to manage with any other medication. In some patients, we try to use lubricants alone but this often fails and the eye might need to be removed. A surgical treatment called 'parotid duct transposition' can be a last resort and can be very successful. We will discuss this with you if we feel that your dog is not responding to medical treatment, please see our factsheet on 'parotid duct transposition' for more information on this procedure.