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Elevation of the Third Eyelid & Miosis in a Cat

A ten-year-old, neutered male domestic shorthair cat was presented for evaluation of the left eye.

History. The cat lives in a household with another cat that does not manifest any ocular or other systemic abnormalities. The cat was presented to the primary veterinarian one week earlier for elevation of the nictitans and miosis. Anterior uveitis was diagnosed and topical corticosteroid drops were administered, but no improvement was noted.

Physical Examination. General physical examination was normal. The right eye was normal; however, the left eye had obvious elevation of the nictitans and miosis relative to the right eye (anisocoria). Right eye direct and left eye to right eye pupillary light reflexes were normal.



However, due to miosis, left eye direct and right eye to left eye pupillary light reflexes were abnormal. Intraocular pressures as measured with a Tono-Pen XL (Medtronic, www.medtronic.com) were 15 mm Hg in both eyes. Fluorescein stain was applied to each eye and no uptake was seen. There was no aqueous flare

and no other abnormalities were evident in the anterior and posterior segments. Schirmer's tear test was 16 mm/min in both eyes; a cranial nerve exam, including CN 3, 4, 5, 6 and 7, was normal. In addition, menace response was normal in both eyes.

continues

ASK YOURSELF ...

- Describe all of the ocular abnormalities as completely as possible.
- What are the differential diagnoses consistent with these clinical signs and the ophthalmic examination?
- Does lack of response to topical corticosteroids change the order of the differential diagnoses?
- What diagnostic test is most likely to be useful in this patient?

Diagnosis: Horner's Syndrome

Examination of the left eye (**Figure 1**) reveals an elevated nictitans, ptosis of the upper eyelid, enophthalmos, and miosis (relative to the right eye). When the eye is dark adapted, the miosis is more pronounced as the right pupil dilates fully and the left pupil remains miotic. No other abnormalities are evident.

Differential Diagnosis. Anterior uveitis is one of the most common misdiagnoses for this condition in both dogs and cats, most likely due to misinterpretation of the clinical signs. Miosis is one of the most common clinical signs of anterior uveitis. In addition, elevation of the nictitans and enophthalmos are clinical signs of pain that often accompany anterior uveitis, but the lack of aqueous flare, conjunctival hyperemia, and the normal and similar intraocular pressures in both eyes do not support this diagnosis. Another differential diagnosis in both dogs and cats is ulcerative keratitis. However, fluorescein staining ruled out this differential.

Diagnostics. Pharmacologic testing was performed as follows: One drop of 1% phenylephrine was administered to each eye. Within 10 minutes of administration, the ptosis of the left eye, enophthalmos, and elevation of the nictitans were ameliorated (**Figure 2**). At 20 minutes, no further changes were evident. Based on amelioration of the majority of clinical signs 10 minutes after phenylephrine administration, the



1 Right eye is normal. Left eye demonstrates elevation of the nictitans, enophthalmos, ptosis of the upper eyelid, and miosis.

lesion was localized to the third order (postganglionic) neurons. The third order neurons originate at the cranial cervical ganglion located ventromedial to the tympanic bulla.

If the clinical signs do not change with administration of 1% phenylephrine, Horner's syndrome should not be ruled out because denervation hypersensitivity takes 7 to 14 days to develop. However, if there are no changes in clinical signs, Horner's syndrome can be localized to the first or second order neurons (ie, central or preganglionic, respectively). Pharmacologic testing with 1% hydroxyamphetamine can be performed 24 hours following the initial test and produces a clear distinction between pre- and postganglionic Horner's syndrome. Cocaine (6%) will not confirm the location of the lesion and is illegal.

Treatment. Causes of third order or postganglionic Horner's syndrome include otitis media,



2 Following phenylephrine, postganglionic lesions will respond within 10 minutes with improvement in ptosis, enophthalmos, and elevation of the nictitans. The miosis will take longer to improve (up to 40 to 60 minutes).

head trauma, vigorous ear cleaning, previous bulla osteotomy, cavernous sinus syndrome, and neoplasia near the middle ear or anywhere along the course of the postganglionic axons. In dogs, this condition often accompanies endocrinopathies including hypothyroidism and diabetes mellitus. However, in the majority of cases, the cause is not identified and cases are designated as idiopathic. One study found that a cause was not identified in 50% of dogs and 42.3% of cats.¹

Treatment of postganglionic Horner's syndrome focuses on addressing the underlying cause. In cases of idiopathic postganglionic Horner's syndrome, cases will improve within 6 weeks following onset of clinical signs. In cases where the underlying cause is identified and able to be treated, clinical signs will resolve if it is addressed. If no improvement is noted, then further diagnostics, such as MRI or CT of the head and complete blood analysis (including thyroid function testing in dogs), are warranted.

Outcome. A complete physical examination, blood analysis (complete blood count and serum chemistry panel), and an MRI were performed and no abnormal findings were evident. The clinical signs resolved within 6 weeks and did not recur. ■

See Aids & Resources, back page, for references, contacts, and appendices.

DID YOU ANSWER ...

- Elevated nictitans, ptosis of the upper eyelid, enophthalmos, and miosis (relative to the right eye)
- Anterior uveitis, Horner's syndrome, ulcerative keratitis
- Yes. In most cases, anterior uveitis will respond to corticosteroid treatment resulting in less pain, more normal pupil size, improved response to light, and improvement in enophthalmos and elevation of the nictitans.
- Pharmacologic testing with one drop of 1% phenylephrine administered to each eye