

# Horner's Syndrome

A "syndrome" is a collection of symptoms that have meaning when they go together. It is important to realize that having a syndrome is not the same as having a diagnosis. A syndrome, however, often has a limited number of causes such that recognizing a specific syndrome brings one substantially closer to a specific diagnosis.



## WHAT IS HORNER'S SYNDROME?

Horner's syndrome consists of five signs:

- Constricted Pupil (medical term "miosis")
- Elevation of the Third Eyelid (medical term "prolapsed nictitans")
- Retraction of the eyeball into the head (medical term "enophthalmos")
- Slight drooping of the Eyelid (medical term "ptosis")

All these signs are caused by disruption of the sympathetic nervous system as it supplies the eye on the affected side of the head.

## WHAT IS THE SYMPATHETIC NERVOUS SYSTEM?

Our bodies have numerous functions that are controlled by our nervous systems, yet we are completely unaware of them. Our heart and respiratory rates, the amount of sweat and other secretions we produce, circulation to different body areas, pupil dilation and constriction are all regulated by our nervous systems automatically and without our knowledge or control. The part of our nervous system dedicated to these automatic systems is called the "**Autonomic nervous system.**"

The autonomic nervous system is divided into the "**sympathetic nervous system**" and the "**parasympathetic nervous system.**" The parasympathetic system maintains a status quo, normal, "business as usual" state; the sympathetic system prepares the body for a "fight or flight" situation. Some changes that might be stimulated by the sympathetic system include: increased sweating, dilated pupils, increased heart rate, and increased blood flow to muscles. Both systems coexist in balance in the healthy body.

When the sympathetic system controlling one of the eyes is damaged, only the parasympathetic nerves work and Horner's syndrome is created.

## HOW CAN THE SYMPATHETIC DISRUPTION OCCUR?

The nerves carrying the tiny nerve fibers that provide sympathetic control to the eye have a long path and the damage may have occurred anywhere along this path.

1. The nerves originate in the brain stem, at the base of the skull. the neck meets the head.
2. These nerves travel down the spinal cord to the lower neck and upper chest (vertebrae T1-T3).
3. They exit the spinal cord just inside the chest and travel at the top of the chest and neck in a nerve called the vagosympathetic trunk.
4. These nerve fibers then connect to second set of nerves just below the ear, in what's called the cranial cervical ganglion.

5. The second set of nerves go into the skull, travel through the middle ear cavity and then continue their journey to the eye.

Damage causing Horner's Syndrome can occur in the brain stem, neck, chest, skull, ear or eye. Damage can occur in the form of trauma, tumor growth, infarction (abnormal blood clot or stroke), middle ear infection, or diseases of the eye itself. At other times, Horner's syndrome occurs due to degenerative of any of the nerves in the pathway, due to problems coded in the genes. Golden Retrievers are particularly susceptible to this kind of Horner's Syndrome that seemingly has no apparent cause.

## **SORTING IT OUT**

Localizing which area of the sympathetic nerve system is affected goes a long way in determining the nature of the damage, as different areas of the system are prone to different types of injury and disease. Special eye drops can be used to stimulate different areas of the nervous system and determine if the lesion is in the first nerve segment or in the second nerve segment. Most are in the second nerve segment.

**Second nerve segment problems (medical term "post-ganglionic"):** If middle ear infection is not obvious and disease of the eye beyond the Horner's syndrome itself is not obvious, then it is probably prudent to allow the syndrome to resolve on its own. This usually occurs within 6-8 weeks. Further diagnostics may be undertaken if new developments occur or if the syndrome persists beyond this time.

**First nerve segment problems (medical term "pre-ganglionic"):** Involvement of the first nerve segment indicates a problem in the brainstem, neck, chest, or spinal cord, and is more significant. Chest, neck and skull x-rays should be taken to look for the cause of the problem. Chest x-rays will also help rule out cancer that has spread to the chest (the only sign of this may be the Horner's syndrome). The front leg should be carefully checked for evidence of function loss as a tumor or protruding intervertebral disc in the neck could be exerting pressure on the spinal cord. Trauma to the neck as with a strong jerk from a collar or straining against a leash can also produce Horner's syndrome from this section of the nerve. Generally more diagnostic work is needed for cases involving the first nerve segment as there is potential for more serious underlying causes. If the syndrome stemmed from pulling on the leash, it should resolve uneventfully depending on how badly damaged the nerve is.

## **TREATMENT**

It is not necessary to treat Horner's syndrome. The syndrome is not painful and does not interfere with vision. The significance of the syndrome is that it indicates nerve damage which might indicate an underlying problem that needs to be treated. If one wishes to treat the syndrome for cosmetic reasons, phenylephrine eye drops can be prescribed to relieve clinical signs.

We do, however, want to treat the underlying cause of Horner's Syndrome, if it can be identified and is treatable. For middle ear infections, ear medications and oral antibiotics may be needed. As well, if the infection fails to resolve, your pet may need to be sedated for culture of the middle ear, flushing of the middle ear, and packing of the middle ear with medications. Of course, if cancer or benign tumors are present they will need to be biopsied in order to determine best treatment.

### *References:*

Wendy Brooks – VeterinaryPartner.com  
Wendy Blount – PracticalvetMed.com