Proceeding of the NAVC
North American Veterinary Conference
Jan. 8-12, 2005, Orlando, Florida

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OPHTHALMOLOGY OF SMALL MAMMALS

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EXAMINATION OF SMALL MAMMALS

The general approach to the ophthalmoscopic examination of small mammals should not differ in any way from that performed in domestic species. Many ocular conditions are common to all species.

Rodents are utilised in laboratories for toxicological studies and as experimental models, particularly for the understanding of ophthalmic pathology. Such studies have substantially furthered our understanding of ophthalmic problems in pet rodents.

It is advantageous to use a magnifying loupe, slit-lamp biomicroscope, or a direct ophthalmoscope (with a +10 to +15 dioptre lens selected) for examination of the anterior segment. Examination without additional magnification could lead to the missing of subtle changes. Fundoscopy in all but the larger species is best achieved using indirect ophthalmoscopy with a 90 dioptre lens which allows examination through a small (often undilated) pupil.

Examination is aided by the correct handling. Scruffing will, however, often result in exophthalmous in most rodents but particularly noted in hamsters (Mesocricetus spp.), which substantially alters the appearance of the conjunctiva, eyelids and in some cases cornea. The use of a short acting gaseous agent, such as isoflurane has many advantages in allowing a thorough examination of the eyes and sample taking for further investigation with minimum restraint required and almost no stress to the rodent concerned.

Mydriatics have a variable effect in rodents. Those with a variable effect in rodents. Those with pigmented irides (e.g. Lister Hooded rats) are more resistant to the effects of mydriatics, possibly because the drug binds to melanin in the iris reducing its availability to the synaptic terminal. Repeated application of 10% phenylephrine three or four times within a fifteen minute period often achieves mydriasis.

EYELIDS

Blepharitis in rabbits can be found with Treponema cuniculi (rabbit syphilis) or Myxomatosis.

LACRIMAL APPARATUS AND CONJUNCTIVA

Epiphora can be associated with obstruction of the nasolacrimal duct as a result of malocclusion or overgrowth of the incisors. Corrective dentistry may prevent this problem. Diagnosis is aided by radiographs showing the abnormal roots of the incisors.

In rodents, chromodacryorrhea (red tears) is a common finding, especially in older animals. It is caused by porphyrin secretion from the Harderian glands usually because there is a dacyroadenitis from an infection with a coronavirus, Sialodacryoadenitis virus (SDAV – closely related to MHV antigenically) may also cause chromodacryorrhea, often accompanied by other ocular problems including blepharospm, keratoconjunctivitis, megaloglobus and hyphaema. SDAV is highly contagious and spreads rapidly by aerosol, direct contact and fomite transmission. SDAV can also cause focal chorioretinopathy and secondary retinal degeneration. Chromodacryorrhea can also occur when there is a tumour of the hardierian gland, this is more common in mice.

In rabbits the epiphora is usually a whitish discharge. The discharge is either associated with excessive lacrimation or blockage of the nasolacrimal ducts. The nasolacrimal obstruction can be due to a build up of the discharge (dacyrocysitis) or dental disease, especially associated with incisor root abnormalities. Radiographic assessment of the skull is always useful in these cases. Fluxing of the ducts is possible but is best initially performed under sedation. It is often necessary to repeat the procedure and after the first occasion, this can be done in the conscious rabbit, but after liberal use of proxymethocaine (including via a canula into the nasolacrimal duct) and time allowed for it to take effect.

CONJUNCTIVA

 Conjunctivitis occurs commonly in hamsters (Mesocricetus spp.), and the resulting exudate may result in the eyelids becoming stuck together. This is often associated with the presence of sawdust bedding and is commoner in old or debilitated hamsters which are no longer grooming themselves or are dehydrated. Gentle bathing will open the eyelids, allowing treatment with topical antibiotic drops. Ointments should be avoided as these tend to cause accumulation of further sawdust or bedding material. The bedding should be changed to newspaper and any underlying cause treated.

Chlamydial conjunctivitis occurs in Guinea pigs (Cavey) as well as in cats and koalas (Phascolarctos cinereus). This is thought to be a naturally occurring disease, but it has been used as a model for human ocular and genital chlamydial infections. The condition in guinea pigs is known as guinea pig inclusion conjunctivitis (GPIC). It is caused by one of a number of strains of Chlamydia psittaci which potentially has a broad range of hosts. GPIC is a self limiting disease. Initially it is seen as a mild serous ocular discharge which usually resolves in 3-4 weeks. It may also cause neonatal conjunctivitis (transmitted from the genital tracts of the females).

In Rabbits, Pasteurella infection is often associated with infectious conjunctivitis. There may also be systemic signs (especially respiratory signs).

THIRD EYELID

Prolapse of the nictitans gland occurs in gerbils (Meriones unguiculatus). Surgical removal is indicated. Radiosurgery / electrosurgery should be employed to limit the possibility of fatal haemorrhage from the orbital venous sinuses.

CORNEA

All pet rodents and lagomorphs may develop corneal ulceration, the presence of which can be confirmed with fluorescein. Ulceration is usually due to a foreign body, such as sawdust or hay bedding but can also occur as a result of fighting, as in male mice or chinchillas that are kept together.

The conjunctival forix should be flushed to remove all foreign material and topical antibiotic drops provided. The cornea usually heals rapidly. Treatment can be with a third eyelid flap. A conjunctival pedicle flap can also be employed.

Corneal stromal abscess can occur, this is seen as a thickened dense white area of the cornea.

Corneal occlusion is where a ring of conjunctiva grows across the cornea, starting from the limbus usually it is not attached to the corneal surface. This may be unilateral or...
The cause is not known. Surgical treatment to remove the tissue with post operative topical corticosteroids may prevent recurrence, but frequently intermittent surgery may be required. Mitomycin C is likely to be the only treatment, post surgery that is likely to guarantee no recurrence.

Exposure keratitis can occur if there is facial nerve paralysis. Keratitis can also be caused by entropion, some types of which can be hereditary.

Spontaneous inherited corneal dystrophy and stromal corneal degenerations have been reported in rats. Keratitis has been seen, usually associated with viral infections (SDAV), in rats.

LENS

Cortical cataracts of suspected genetic origin have been reported in strains of Abyssinian and English short-haired guinea pigs. Cataracts are commonly found in older animals. Cataracts may also develop in association with Diabetes mellitus or secondary to retinopathy. Hereditary cataracts as well as dietary (sucrose), and drug-induced (e.g. streptozotocin, which induces diabetes mellitus) cataracts have been reported in rats.

There is a reversible cataract due to lens opacities that may develop in rodents during heavy sedation or anaesthesia. These are thought to be associated with prolonged periods of non-blinking, resulting in the evaporation of fluid from the anterior chamber, which in turn affects the transparency of the anterior lens.

In rabbits, cataracts can be associated with Encephalitozoon cuniculi.

GLAUCOMA

Glaucoma can be seen in rabbits, but not as commonly as in dogs. In some strains (mainly laboratory) this has been shown to be an inheritable condition. Usually there is a progressive buphthalmos. This is known to be hereditary in the New Zealand White Rabbit. In mice, strain-related glaucoma are reported.

Although Buphthalmos is often seen in cases of glaucoma, a pseudobuphthalmos may be seen in association with retrobulbar inflammation or infection. In rabbits abscess formation behind the eye is frequently associated with dental disease, but as part of the treatment it may also be necessary to remove the eye in order to get to the infected orbit to allow the attempt debridment.

FURTHER READING