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Eye conditions in focus

Horses are vulnerable to a range of eye problems, from the relatively minor to the very serious – prompt veterinary diagnosis and treatment is therefore essential

There are whole textbooks covering conditions affecting equine eyes and it is impossible to mention all of them – or even most of them – in an article of this length. However, there are some that are encountered frequently and a few we appear to be seeing more often than in previous years.

Trauma is relatively common and can involve anything from bruising of the surrounding tissues to complete rupture of the eye requiring surgical removal (enucleation). Even a minor injury can have a detrimental effect on the eye and vision because of the way the eye responds to physical insult. All injuries to the eye region, any lumps or abnormalities in appearance, colour or contour should be assessed by a vet.

The horse evolved as a grazer and prey animal and so the position of the eyes towards the sides of the head facilitate vision in front and both sides. The globe (eye ball) is relatively large and set in the bony orbit (socket), which provides only a small degree of protection from direct trauma.

In the simplest terms, the eye itself is made up of three distinct layers: the outer semi-rigid layer comprised of the sclera (white part we can see around the edges but which makes up most of the outer surface of the eye) and the clear cornea; the vascular layer made up of the coloured iris (usually brown but might be blue or pink), the ciliary body and the choroid (which extends under the retina); and the retina, which is essentially a layer of nervous tissue that receives and processes the light that enters the eye. The lens is a transparent disc which sits just behind the iris. There is clear fluid (aqueous) in front of the lens and gel-like vitreous behind it.

The one-eyed Patch ran in the 2017 Kentucky Derby

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Figure 1 Ulcer showing fluoroscein staining

Corneal ulcers

Corneal ulcers are superficial defects in the outer layer(s) of the cornea. They are very common and might be visible to the naked eye. In most cases, however, fluorescein dye is used to demonstrate any defect in the surface and assess healing. It shows up as green in damaged areas in the superficial cornea (*Fig 1*).

However, ulcers can also be deeper with inflammation in the deeper structures (*Fig 2*). The eye is usually painful and so might be partly or fully closed with excessive tear production and reddening of the conjunctiva. If very painful, the pupil may be tightly constricted. The eye might be partially or totally cloudy reflecting oedema within the cornea.

In more complex cases, or if there has been trauma to the eye, there might be dead white cells or blood within the eye between the iris and cornea. Treatment usually involves using topical antibacterial preparations with or without systemic non-steroidal anti-inflammatories (NSAIDs) to help with the discomfort. These eyes are very painful and atropine is often used to force the pupil to dilate. This helps with pain relief and clearance of inflammatory products from the eye. Most ulcers heal quickly and well but complications can occur.

A melting ulcer is one which progresses to affect the deeper and surrounding cornea and might even perforate, resulting in rupture of the globe. In some cases, secondary bacterial or fungal infections can occur and these can require prolonged aggressive treatment. Healing deep ulcers might be accompanied by the inward growth of tiny blood vessels into the cornea (neovascularisation) from its margin (*Fig 3*). Scarring and pigment deposits can develop in the cornea (*Fig 3*) and/or the deeper structures depending on any complications which might arise. These changes might affect the horse's sight and the ability of the pupil to constrict and dilate permanently.

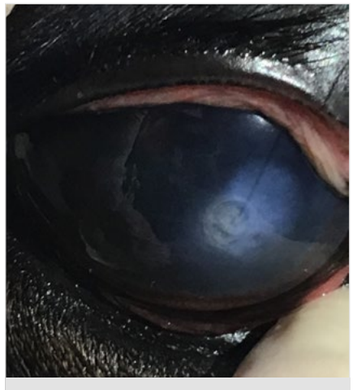

Figure 2 Deeper ulcer showing corneal oedema

When an eye is very painful topical treatment might be needed several times a day with a variety of medicines. In these cases, a tube can be inserted through the skin and into the conjunctival pouch inside the upper or lower lid (subpalpebral lavage system) with the free end attached to the forehead and/or headcollar or mane to avoid having to repeatedly touch the eye (*Fig 4*).

In severe or non-healing ulcers, surgical treatment might be indicated in the form of a conjunctival flap – where a section of conjunctiva is released and sewn to the margins of the ulcer to provide a blood supply and physical protection or a cornea graft.

Figure 3 Inflammation and pigment deposition in cornea

Figure 4 Deep ulcer showing changes in the cornea

Viral Keratitis

Infection with equine herpesvirus 2 (EHV-2) is more common than we appreciate. It causes tiny, almost imperceptible, spots to appear in the cornea or can result in cloudiness of the entire corneal surface. The eye is usually painful. It can be difficult to definitively diagnose this condition as isolation of the virus or positive PCR on a corneal swab is required. As with most herpesviruses, the infection tends to be lifelong and might recur. The infection might also be associated with inflammation of some of the deeper tissues (uveitis). Topical antiviral drugs are used in combination with NSAIDs and topical antibiotics.

Eosinophilic Keratitis (EK)

We have seen several cases of this condition despite the textbooks saying it is relatively rare. The eye presents with one or more apparently superficial, but non-healing, ulcers which take on a slightly cloudy appearance. There is usually an associated conjunctivitis and the eye is painful and partly or fully closed with a whiteish discharge. The ulcers don't heal in the way that a 'normal' ulcer will heal even with treatment.

Diagnosis is based on the presence of eosinophils (a type of white cell) in either scrapings or washings from the eye. Treatment involves application of corticosteroids and systemic NSAIDs and can be prolonged. Antibiotic treatment might be necessary. Note: we normally avoid the use of corticosteroids in eye ulcers but EK is one exception to this rule, provided there are no secondary complications. In many cases it is necessary to surgically remove the affected superficial layers of the cornea (keratectomy) to allow healing. This might require a general anaesthetic.

Uveitis

This is inflammation of some of the deeper structures of the eye, namely the iris and ciliary body and adjacent tissues. Uveitis can be the result of trauma to the eye and can be seen with some ulcers. It is also seen with some systemic diseases and can also occur without any obvious inciting cause. Treatment of uveitis involves topical atropine (or other pupil-dilating medication) and systemic anti-inflammatories, including corticosteroids, in addition to treating any primary condition.

There is an important and relatively common condition known as equine recurrent uveitis (ERU) or 'moon blindness' in which there are repeated episodes of uveitis in one or both eyes. It is understood to be an autoimmune condition, meaning that it is the result of the body's abnormal or excessive immune response. The exact causes are complex and still poorly understood but it can occur with certain systemic bacterial diseases. The condition is painful and causes the horse to close or partially close the eye. There is excessive tear production, the conjunctiva is usually inflamed and the pupil usually tightly constricted. The iris might appear abnormal in contour and colour. Over time, repeated episodes of inflammation can cause scarring and adhesion formation between iris and lens or iris and cornea. The pupil might become distorted, the lens opaque (cataract) and eventually the eye will become blind (*Fig 5*).

Figure 5 Eye showing scarring, adhesions and cataract following ERU

In some horses with ERU, the affected eye might have to be removed (enucleation) to save the horse from the recurrent episodes of severe pain. For ERU, topical and systemic treatment must be aggressive but scarring can still occur and worsens with each episode. There are two surgical procedures which can offer hope to some horses. One involves the insertion of a cyclosporine implant under a flap in the sclera (white part of the eyeball). This is a drug that suppresses the immune response in the eye and is effective in some cases. The other procedure involves surgically removing the vitreous (gel-like content of the eye) and replacing it with sterile saline. The theory is that this removes the inflammatory material in the eye, minimising the severity of future episodes.

Cataracts

A cataract is any density or loss of opacity in the lens. They are frequently found in older horses and, to a certain extent, have to be considered part of the normal ageing process. In younger horses, however, they can be an indicator of previous eye disease or injury and could indicate that the horse suffers from ››

ERU. Some foals are born with cataracts (congenital cataracts). Many cataracts affect only part of the lens and might not significantly affect the horse's sight.

Others are dense so that the lens appears white and crystalline and these eyes are blind. Cataract removal is an option in a small number of cases and can be undertaken only by specialist ophthalmologists.

Tumours

Eye tumours are relatively uncommon but they do occur and should be considered if there is any persistent or growing abnormal tissue in the region. The most common tumour to affect the eye is a squamous cell carcinoma (SCC). These can spread locally but might also disseminate elsewhere in the body. Initial signs often appear in the third eye lid as an area of slightly granular pink tissue (*Fig 6*). If left untreated, it will spread to the adjacent eyelids, conjunctiva and cornea. Small tumours may be surgically excised and follow-up treatment with chemotherapy or radiation therapy might improve outcomes, but if the carcinoma has spread it might be necessary to remove the eye. Systemic spread usually means prognosis is very poor to hopeless.

Figure 6 Tumour affecting third eyelid and adjacent tissue

Lymphosarcoma can also affect the eye and, again, often first affects the third eyelid as this tissue already contains a considerable amount of lymphoid tissue. Histology is usually required to differentiate this from an SCC. Local spread is possible and tumours can develop within the eye or often in the head and neck region, or be found elsewhere in the body.

Melanoma is another fairly common eye tumour, especially but not exclusively in grey horses. These commonly occur as part of a more generalised condition where numerous melanomas develop over the body in older grey horses.

However, a more aggressive condition can occur in younger horses where the tumour arises from the pigment cells in the iris. It can be difficult to treat ocular melanoma and removal of the eye is the treatment of choice to try to stop spread into other tissues and sites.

Conclusion

Most horses cope very well with a degree of impairment of their sight and one-eyed horses are capable of performing well if handled appropriately. One of the main issues with eye disease or injury is pain. Controlling pain and the processes that contribute to it can be one of the biggest challenges in dealing with eye conditions. Early assessment and intervention can often help to minimise long-term damage and pain.

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