



# Animal Eye Clinic

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## EQUINE CORNEAL ULCERS

### **What is a corneal ulcer?**

The cornea is the transparent layer located at the front of the eye. It is about 1mm thick and consists of four layers: epithelium, stroma, Descemet's membrane, and endothelium. A corneal ulcer is a disruption of one or more layers of the cornea. They range from simple scrapes of the epithelium to deep erosions involving the entire stroma that can result in the rupture of an eye. Ulcers are extremely painful because the cornea contains many nerve endings.

In order to diagnose a corneal ulcer, a special stain called Fluorescein is applied to the cornea. The layers of the cornea have different affinities for water, with the epithelial layer and Descemet's membrane being hydrophobic, and the stromal layer being hydrophilic. Fluorescein is also hydrophilic, so it will stain the stromal layer, giving a visual distinction to the ulcerated area.

The four main categories of ulcers include:

- **Superficial ulcers** are minor disruptions in the epithelial layer. Although initially painful, these ulcers usually heal within a few days of starting treatment.
- **Indolent ulcers** are those that do not heal normally or continue to worsen with normal treatment. They may take weeks or months to heal and require aggressive medical and surgical treatment. Some ulcers may not heal because of continual exposure external irritants. Removal of these irritants is necessary to the healing process.
- **Infected ulcers** have been colonized by environmental bacteria via a break in the epithelium. Also known as **melting ulcers**, signs of an infected ulcer include pus-like discharge from the eye, a yellowish discoloration of the ulcerated area, and increased ocular discomfort. Infection slows the healing process and can cause them to worsen into deep ulcers. Melting ulcers are very common in horses and require aggressive medical and/or surgical therapy to prevent them from progressing. When an infection is suspected, cytology and culture of the affected area are important tools in determining appropriate medications.
- **Deep ulcers** include erosions deep into the stroma, as well as descmetocoeles which expose Descemet's membrane. Due to the thinning of the corneal layers, deep ulcers may result in a perforation of the cornea. These ulcers require aggressive medical treatment and usually require surgical intervention.

### **What caused my horse's corneal ulcer?**

Corneal ulcers are one of the most commonly seen eye problems in horses. Corneal ulcers may be caused by many things including:

- Trauma, i.e. running into a fence, poked in eye with hay/straw
- Exposure to chemical agents
- Infection by bacteria, virus, or fungus
- Tear film abnormalities
- Eyelid abnormalities
- Exposure keratopathy

## **What will I see if my horse has a corneal ulcer?**

Corneal ulcers can be incredibly painful. Common signs and symptoms include:

- Squinting and light sensitivity
- Discharge from the affected eye(s)
- Redness of the eye
- Cloudiness of the cornea
- Behavioural changes
- Loss of appetite

## **How are corneal ulcers treated?**

The treatment for a corneal ulcer will depend on the type of ulcer that your horse has. A superficial ulcer will normally heal within a few days of treatment with minimal scarring. The usual therapy includes a topical antibiotic ointment applied four times daily to prevent bacterial infection of the ulcer. The eye should be re-stained with Fluorescein after three to four days of treatment to ensure that it has healed.

An indolent, or non-healing ulcer will require a minor procedure known as debridement. A topical anaesthetic is applied to the eye and a sterile swab is used to gently remove the loose epithelium. Continuation of topical antibiotic therapy, as well as the introduction of anti-inflammatory drugs and topical salt solution may also be necessary.

If an infected or melting ulcer is suspected, swabs and/or scrapings of the cornea may be taken for bacterial culture, fungal culture, and cytologic evaluation. These tests will help to determine what treatment regime will be the most effective. These ulcers result in a sloughing of the cornea that progresses in a matter of hours and require aggressive treatment with topical antibiotics, topical atropine, topical serum, and intravenous anti-inflammatories. They may also require anti-fungal drugs if fungal involvement is suspected. In very serious cases, a surgical procedure known as a keratectomy may be performed under general anaesthesia. The keratectomy removes the damaged layers of the cornea, which aids the healing process. In some cases a conjunctival flap may be placed to provide the ulcer with an immediate blood supply and structural strength.

Deep ulcers and descemetocoeles should be considered emergencies. In most cases, immediate surgical intervention is required in order to prevent perforation of the cornea. Various surgical techniques can be used to treat deep ulcers. Most commonly a conjunctival graft will be placed to provide tissue strength and blood supply. In some cases, a special membrane may also be placed to increase structural strength and help to fill in the erosion. Post operative medical therapy including topical antibiotics and oral anti-inflammatories will be necessary. Scarring of the cornea is a common result of deep and melting ulcers. The horse's vision may be impaired once the ulcer has healed.

In the more complicated ulcers, such as melting and deep ulcers, it will be necessary to place a subpalpebral lavage system. The lavage consists of a piece of flexible tubing passed through the eyelid, between the horse's ears, and plaited into the mane. An injection port located at the very end of the tubing, at the horse's neck, allows us to medicate the eye from a distance. This lavage allows us to treat the horse hourly with topical medications. It is necessary for the safety of the horse and the caregiver, as horses' tend to resent being medicated frequently and may strike out.

## **What will I need to do at home?**

In most cases, the horse will be hospitalized while the ulcer is being treated. This allows the horse to be monitored continually by the veterinary staff, and hourly medications to be given via the subpalpebral lavage system. Once the immediate danger to the eye is removed, usually after two to four weeks of treatment, the horse may be managed at home.

It is important to be aware of any changes in your horse, and to follow these guidelines:

- Keep a fly mask on your horse to prevent flies, dust, and further trauma.
- Follow all directions regarding the care and medication of your pet. Do NOT stop medications without consulting your veterinarian.
- Feed your horse on the ground or in a shallow manger. NO haynets!
- Limit exercise to hand walking and house your horse in a dark stall where possible.
- Contact the veterinarian if you have any concerns or if you note any changes.

Although they may begin as a minor inconvenience, ulcers can quickly escalate into major emergencies.