

Corneal abrasion and ulcers

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Caution: this file contains pictures that may be distressing for some persons.

The cornea, or transparent front part of the eye, is a well-studied tissue in rabbits. It is a fiber-like structure with 4 distinctive layers:

- a keratinized layer of epithelium (30 to 40 μm),
- the stroma, formed by parallel bundles of collagen,
- the Descemet's membrane (7 to 8 μm),
- a single layer of endothelium, which is rich in Na^+ -ATPase pumps.

The cornea covers up to 30% of the rabbit eye. Due to this large size, the cornea is prone to trauma or other damages, including drying-out. If the epithelial layer of the cornea is scratched or wounded, it often becomes locally opaque and shows the presence of new vascularisation.

Corneal abrasion and ulcers are painful, as the surface of the cornea is well innervated. This brings a rabbit to rub its eye, which can lead to the development of an ulcer. For a list of further causes, see: [Corneal ulcers in rabbits](#).

The pain caused by the ulcer can furthermore lead to the contraction of the pupil, conjunctival hyperemia (presence of excess blood), and epiphora (increased production of tears). The rabbit is often depressed and can stop eating or drinking.

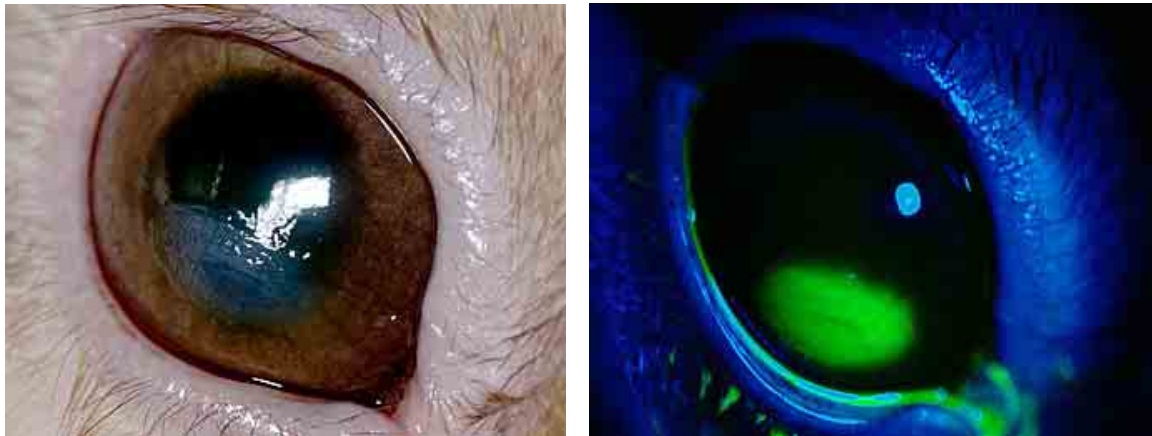
Various types of ulcers are observed in rabbits.

Clinical signs and diagnosis

Superficial corneal abrasions and ulcers can sometimes be seen as an opacity on the surface of the eye. Usually they are not visible, and the use a fluorescent dye (fluorescein) is needed in order to determine the extent of the damage, and its depth.

If the ulcer is infected, it is necessary to take a sample for a bacterial culture, or other tests, before the application of the dye.





VEIN (Veterinary Exotic Information Network) System, Copyright © Akira Yamanouchi

**Left: Rabbit eye with a corneal ulcer as seen with normal light
Right: Same eye, seen with black light (Wood's light), after application of the fluorescein dye.**

Corneal ulcers can be accompanied by a temporary constriction of the pupil (miosis), or inflammation of the uvea (uveitis).

The presence of corneal damage can be accompanied by an overflow of tears (epiphora), involuntary closing of the eyelids (blepharospasm) and accumulation of blood (conjunctival hyperemia).



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Scar on the surface of the cornea (arrow), after healing.

Underlying disorders or diseases should not be ruled out. Indeed, corneal ulceration can be the result of exophthalmos (protruding eyeball), leading to the impossibility to blink. Possible causes can be the presence of a retrobulbar abscess, neoplasia, cellulitis, or tooth root related problems, like the presence of an abscess or abnormal elongation of the tooth root in the



direction of the eye socket. Abnormal growth of the eyelashes (e.g. entropion, distichiasis) is a further cause for corneal abrasion and ulceration.

Treatment

The treatment depends on the type of ulceration (abrasion, ulcer or descemetocele) and its cause, depth and extent.

The treatment of superficial abrasion and ulcers includes the application of a topical antibiotic solution 4 to 6 times a day. Indeed, its effect lasts only a few minutes. Topical atropine has good healing properties and needs to be given twice a day only. The treatment should be accompanied by the administration of pain-relief medication. Healing is usually observed within 3 to 5 days.

If a corneal ulcer or descemetocele is present, it is important to protect the eye. The treatment must be aggressive, with frequent application of topical antibiotics (e.g. ciprofloxacin 3%, ofloxacin 0,3%, norfloxacin 0,3% are antibiotics of choice) and the use of pain relief medication (e.g. meloxicam).



The treatment of the eye is accompanied by the administration of systemic antibiotic.



Non-healing ulcers are characterized by the accumulation of dead cells at the edge of the ulcer, which will prevent healing. In this case, the area must be debrided, so that cells from the healthy corneal surface can start moving towards the ulcer and fill the gap. A local anesthesia is necessary before epithelial debridement can be started with a dry cotton-tipped applicator.

Grid keratotomy, superficial keratotomy or the placement of contact-lenses have also been used to cure non-healing ulcers in rabbits.

When the abrasion or the ulcer is related to underlying anatomical or pathological causes, these must be treated or corrected too, either medically (e.g. abscess, dacryocystitis, blepharo- or keratoconjunctivitis) or surgically (e.g. entropion, distichiasis).

Acknowledgement

Thanks are due to Amy Carpenter (USA) and Akira Yamanouchi, for the permission to use the pictures from VEIN (Veterinary Exotic Information Network, <http://vein.ne.jp/>).

Further information

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SEPTEMBER 2005

