

## Corneal Ulcer in a Sheep - Treatment with Third Eyelid Flap

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### ABSTRACT

**Background:** Corneal ulcers are frequently reported in the literature in several species, however, the treatment of traumatic lesions on the corneal surface of ruminants is still poorly described. The use of the third eyelid flap is questioned when applied to deep ulcers, since the technique prevents the evolutionary follow-up of corneal healing and compromises care. However, several authors report its successful use for the treatment of superficial and deep corneal ulcers. This technique protects the ocular surface and prevents the occurrence of new lesions or their aggravation. The aim of this study was to report the treatment of corneal ulcers in sheep through the third eyelid flap associated with the use of topical antibiotics.

**Case:** A 2-year-old male Dorper sheep, with ocular discomfort, conjunctival hyperemia and mucopurulent secretion in the left eye, was assisted in a private rural property in the West region of Bahia, Brazil. The owner reported that before seeking veterinary help he used a spray based on oxytetracycline and hydrocortisone, which worsened the animal's condition. Upon inspection, it was observed eyelid asymmetry, slight lateralization of the head to the left, periorbital alopecia on the left face, intense blepharospasm in the left eye, with projection of the third eyelid occurring at times. The ophthalmic examination was performed after application of anesthetic eye drops based on proxymetacaine to reduce eye discomfort. A corneal stromal lesion, edema and fibrovascular tissue in the left eye were identified, but the cause of the lesion was not defined, with lagophthalmia, entropion, dystychiasis or ectopic cilia being ruled out. So, it was suggested that the lesion had occurred by a foreign body, such as dust or feed fiber. The contralateral eye showed no changes, Schirmer 15 mm, no changes in sensory and sensory reflexes and negative fluorescein. No signal clinical disease. Due to the severity of the lesion, it was performed a third eyelid flap associated with drug treatment with ciprofloxacin eye drops, every 8 h for 21 days. The animal was placed in the right lateral decubitus position and palpebral akinesia was achieved with the application of 2 mL lidocaine without vasoconstrictor in the region of the auriculopalpebral nerve. This was followed by the routine performance of the third eyelid flap.

**Discussion:** The delay in seeking veterinary care and the application of spray based on oxytetracycline and hydrocortisone aggravated the lesion, since the corticosteroid delays corneal healing and favors the aggravation of the lesion. After desensitization of the cornea, the animal allowed eye manipulation and it was possible to observe the lesion and choose the best treatment, with option for the third eyelid flap because it is a simple and fast technique, does not require special equipment or materials, ideal for performed in the field and is widely used in the treatment of injuries involving the cornea and, besides that, helps to contain corneal perforation and protect the ocular surface. Corneal debridement was also performed to remove necrotic debris and improve drug action, in addition to using broad-spectrum antibiotic eye drops until complete regeneration of the lesion. Twenty-one days after the surgical procedure, the patient had no ocular discomfort, the flap was removed and no changes in the corneal surface were observed. The treatment was considered satisfactory for the healing of the corneal ulcer, guaranteed the esthetics and visual function of the sheep.

**Keywords:** keratitis, surgery, ciprofloxacin, ocular, ruminant.

DOI: 10.22456/1679-9216.118589

Received: 26 October 2021

Accepted: 4 January 2022

Published: 18 February 2022

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## INTRODUCTION

The cornea is part of the fibrous tunic of the eyeball and has 4 layers: epithelium, stroma, posterior limiting lamina (Descemet's membrane) and endothelium [7]. Loss of corneal tissue continuity is called as corneal ulcer [25].

Corneal injuries have been reported in several species, including pandas, birds, horses, goats, canines and felines [1,3,11,20,23,28], but the treatment of traumatic lesions on the corneal surface of ruminants is rarely described in the veterinary literature [3,9].

Treatment will depend on the severity of the injury. It can be medicated [11] with antibiotics and topical lubricants, or surgical in more severe cases [27]. Pediculated bulbar conjunctival graft is the therapy of choice most used in deep ulcerations or when there is corneal perforation [6,14]. Other surgical options are tarsorrhaphy, third eyelid flap, porcine urinary bladder submucosal graft (ACell Vet™), amniotic membrane implant and keratoplasty [1,13,17,24].

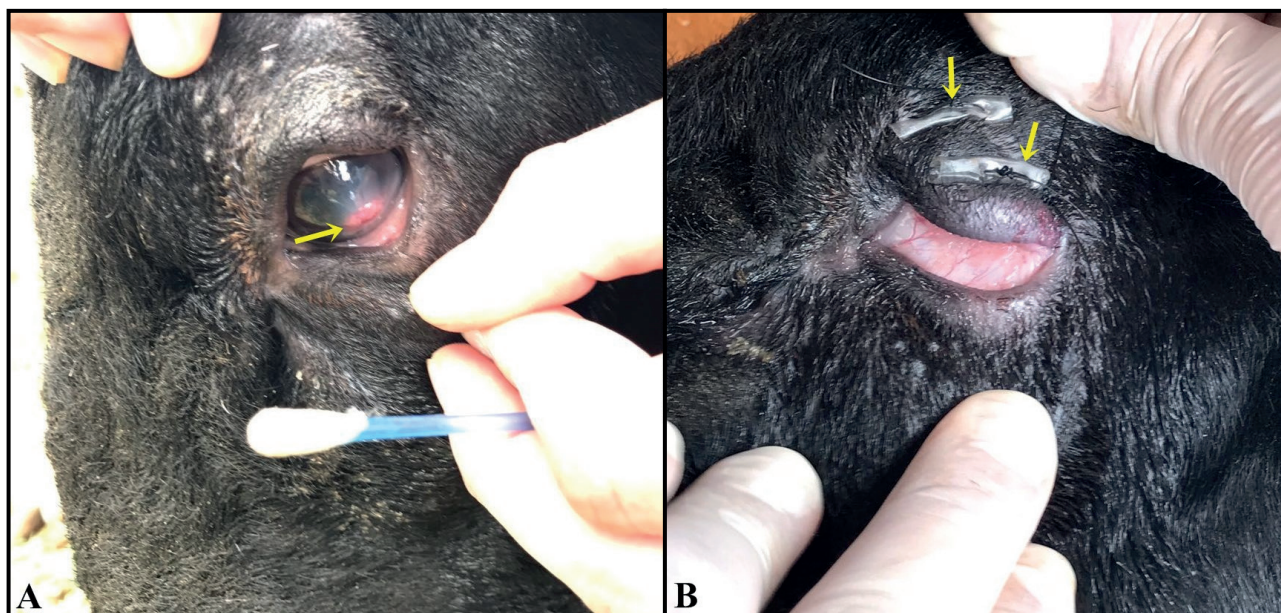
The use of the third eyelid flap is questioned when applied to deep ulcers, since the technique prevents the evolutionary follow-up of corneal healing and compromises care [29]. However, several authors report its successful use for the treatment of superficial and deep corneal ulcers. This technique contains corneal perforation, protects the ocular surface and prevents the occurrence of new lesions or their aggravation [1,3,23,28].

The aim of this report was to describe the clinical resolution of a corneal ulcer in sheep treated with a third eyelid flap associated with the use of topical antibiotics.

## CASE

A 2-year-old male Dorper sheep was treated on a private property located in the West region of Bahia with ocular discomfort, conjunctival hyperemia and mucopurulent secretion in the left eye. The owner reported that about 7 days ago the animal presented ocular discomfort and applied a spray based on oxytetracycline and hydrocortisone<sup>1</sup> directly on the affected eye and observed immediate improvement. After about 5 days, the condition worsened with the appearance of a white and red spot in the animal's eye associated with intense itching in the ocular region.

The animal was alert, had eyelid asymmetry with intense blepharospasm in the left eye, projection of the third eyelid at times, slight lateralization of the head to the left and periocular alopecia. No alterations were identified in the general physical examination. No signal systemic disease. The physiological parameters were within the normal range for the specie. The ophthalmic examination was performed under physical restraint with the patient in the right lateral decubitus position. The periocular region was evaluated with a binocular light source with 3x magnification and after application of anesthetic eye drops based



**Figure 1.** A 2-year-old male Dorper sheep. A- Note extensive corneal stromal lesion, edema and fibrovascular tissue (arrow). B- finished third eyelid flap (arrows).

on proxymetacaine<sup>2</sup> the presence of extensive corneal stromal lesion was identified, with the presence of edema and fibrovascular tissue (Figure 1A). Fluorescein positive. Schirmer's test was not performed.

It was not possible to define the underlying cause of the lesion, since lagophthalmia, entropion, distichiasis or ectopic cilia were not identified. The contralateral eye was normal, Schirmer was 15 mm, with no changes in sensory and sensory reflexes and negative fluorescein. We chose to perform a third eyelid flap (Figure 1B), associated with drug treatment.

For surgery, the animal was placed in the right lateral decubitus position and palpebral akinesia was obtained by applying 2 mL lidocaine without vasoconstrictor<sup>3</sup> in the region of the auriculopalpebral nerve. Two drops of anesthetic eye drops were instilled into the cornea. The cornea was debrided with a flexible cotton swab<sup>4</sup> and was followed by washing with saline solution and a third eyelid flap [18]. Antibiotic eye drops based on ciprofloxacin<sup>2</sup> were used, 2 drops in the affected eye every 8 h for 21 days.

Due to the transportation logistics to the property, the owner was instructed on the care and needs of the veterinarian in case the flap suture broke. Through weekly phone calls, the animal was monitored by the veterinary medical service with the collaboration of the owner. During this period it was reported that the patient sporadically tried to scratch the eye over the stall structures, however this did not generate suture breakage or additional trauma in the face region. Twenty-one days after the surgical procedure, it was observed that the patient had no ocular discomfort, the flap was removed and no significant changes were observed on the corneal surface (Figure 2).

## DISCUSSION

The demand for ophthalmic care in small ruminants is significantly reduced when compared to other care, and especially when compared to ophthalmic complaints in pets [9,22]. The ocular lesions that most affect ruminants are neoplasms [19] and traumatic lesions that cause corneal ulcers [9,22], however, little has been described in the literature regarding the treatment of more severe injuries.

The tutor sought veterinary care 7 days after the onset of the ophthalmic signs for not having a satisfactory response with the self-prescription, which caused the worsening of the condition. This situation is common in Brazil as drugs are sold by people without



**Figure 2.** Sheep eye 30 days after third eyelid flap removal. Note that the cornea has no edema and has restored its integrity and it is possible to observe the other structures that make up the eye.

technical training, without veterinary prescription, indiscriminately [5,31].

Although some recommendations for their topical ocular use, medications in the form of sprays are not indicated for the treatment of corneal ulcers, because they are irritating and do not provide adequate antibiotic concentrations throughout the treatment [18]. Another negative factor is the corticosteroid in its composition, a steroidal anti-inflammatory that inhibits endothelial and epithelial regeneration in the cornea, provides a reduction in the fibroblast response, delays wound healing, reduces the infiltration of inflammatory cells and enhances the action of collagenases, so that favors the development of secondary infections [8,10,18]. All these factors may have contributed to the worsening of the patient's eye condition.

The clinical examination showed no changes and the physiological parameters were within the normal range for the species. It should be noted that small ruminants commonly do not show physiological changes until the condition is severe and secondary infections develop [2,4].

It was necessary to apply proxymetacaine anesthetic eye drops to perform the ophthalmic examination because the animal was reluctant due to ocular discomfort. This procedure made it possible to desensitize the cornea and allowed ocular manipulation without causing greater stress to the animal [15]. When the patient allowed the opening of the eyelids, it was possible to identify through the characteristics of the lesion that it was a chronic corneal ulcer. The underlying cause of the lesion was not found and as the animal lived in a pen and did not present morphological

changes, it is assumed that the lesion was caused by some foreign body, such as dust or feed fiber [12].

No changes were found in the evaluation of the contralateral eye, since the pupillary, corneal and eyelid reflex tests were present and tear production was within the normal range for the specie, which confirmed the integrity of ocular structures and ruled out neurological disorders [7].

Surgical treatment was chosen due to the severity of the injury. The choice for the third eyelid flap procedure was because it is a simple and fast technique that does not require special equipment or materials, ideal for field performance and is widely used in the treatment of injuries involving the cornea of pets, wild or exotic [3,23,24,28]. The third eyelid flap helps to contain corneal perforation, protects the ocular surface, prevents the occurrence of new injuries or their aggravation, in addition to reducing abrasions and discomfort when blinking [1,27].

The manipulation of the ocular surface in animals that present pain or discomfort becomes laborious due to intense blepharospasm. The use of proxymetacaine local anesthetic reduces discomfort and allows local manipulation, however, due to the voluntary eyelid contraction movement, the patient still makes it impossible to properly evaluate and manipulate the cornea [16]. The use of local anesthesia with lidocaine without vasoconstrictor in the region of the auriculopalpebral nerve allowed for palpebral akinesia and associated with topical anesthesia allowed corneal debridement and the performance of the third eyelid flap with greater comfort for the patient and greater ease for the surgeon.

The cornea was debrided with a flexible cotton swab in order to eliminate the degenerated epithelium and necrotic debris, which certainly facilitated corneal

re-epithelialization, improved drug action, reduced inflammatory reactions and allowed for complete healing of the ulcer [30]. It was also decided to use broad-spectrum antibiotic eye drops, low cost and easy to acquire, until complete healing of the lesion, which was observed at 21 days when the flap was removed [3,18].

The time to remove the third eyelid flap is variable. It depends on the severity of the injury and associated factors such as the presence of morphological changes, previously used medications, use of lubricants and blood serum as an adjuvant, availability of displacement for the evaluation of the patient as well as their health condition and availability for applying the medication of continuous form [3,20,21,23,24,26]. It was decided to medicate the patient every 8 h, only with topical antibiotic due to the availability of the owner and the employee of the property who would be responsible for the management. Flap maintenance for 21 days was defined due to the size of the lesion, and it was estimated that it would be sufficient for complete healing of the ocular surface. After flap removal, it was reported that the animal was comfortable and the cornea showed slight opacification.

The third eyelid flap associated with topical antibiotic based on ciprofloxacin every 8 h for 21 days proved to be adequate for corneal healing and esthetic maintenance of the animal in question.

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**Declaration of interest.** The authors report no conflicts of interest. The authors alone are responsible for the content and writing of paper.

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