# Symptoms and management of indolent corneal ulcers in dogs. Overview of some medical and surgical options - case study

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***Abstract***

*Indolent corneal ulcers are also known in the literature as chronic superficial erosions, recurrent epithelial erosions, superficial chronic corneal epithelial defects. The name itself underlines the recurrent, superficial and non-healing characteristics. The aim of this case report is to compare some of the medical and surgical management options available and their outcome upon corneal healing. The study was performed on dogs of different breeds and ages, presented in for ophthalmic examinations at the Surgical Clinic from the Faculty of Veterinary Medicine Iasi, Romania and private practices in Iasi. For this study, there were only taken into consideration dogs with chronic corneal ulcers that did not heal properly within 7-10 days after diagnosis and with clinical signs of loose epithelium around the margins of the lesions. Local medical treatment included the use of antibiotics, vitamins, hyaluronic acid and amino acids, artificial tears. Surgical options available were debridement, grid keratotomy and temporary tarsorrhaphy. Conclusions show that the evolution is longer if only local medication is applied. If owner complies and if overall health status of the patient allows a short, general anaesthesia, it is better to use the debridement and superficial keratotomy together, to allow new epithelium to attach to the anterior corneal stroma and the ulcer to heal faster.*

***Key words****: dog, indolent ulcers, debridement, grid keratotomy, temporary tarsorrhaphy*

## Introduction

The cornea is the perfectly transparent, anterior component of the eye, playing the role of a convex -concave lens. From outside to inside, the cornea has 5 layers: epithelium, its basement membrane (Bowman), stroma, Descemet's membrane, endothelium (posterior epithelium). It is avascular and it has no pigments, but it has a sensitive innervation, provided by nasociliary nerves of the ophthalmic branch of the trigeminal nerve (cranial nerve V) (1, 3). The density of terminal nerves is higher in the center and lesser at the periphery of the cornea. The cornea plays many roles, such as: mechanical, optical, immunological and tissue healing. (2)

Corneal pathology in domestic carnivores summarizes a variety of disorders, which represent real challenges to the veterinary practitioner (4, 5, 6). Corneal pathology consists in several types of conditions: congenital, traumatic, inflammatory and neoplastic (4, 6).

Literature reviews offer data on corneal diseases that are related to specific disorders, such as indolent ulcers in dogs (4, 7), feline corneal ulcers (8), keratoconjunctivitis sicca or pannus (4), feline corneal sequestra (9).

One of the main reasons for ophthalmic consultation in dogs are corneal ulcers. This keratopathy has many predisposing factors, various symptoms and some treatment possibilities. The present paper resumes the symptoms of indolent ulcers and surgical management options.

**Material and method**

Research has been achieved on the number of cases presented for ophthalmic examination at the Faculty of Veterinary Medicine in Iasi, the Surgical Clinic, throughout the years 2007-2017 and at the private clinic Pets Land (Iasi). From the total number of carnivores, we collected those presented for a chronic superficial ulcer. A relevant and thorough history, completed by an orderly and extended ocular examination, gave a correct diagnosis and the possibility of successful clinical results.

**Results and discussion**

The clinical signs of an indolent ulcer that should draw the veterinarian's attention is the lack of resolution after 7-10 days of treatment, persistance of moderate ocular pain, translated by blepharospasm, and any ocular discharge (serous or mucoid). Around the ulcer itself, the corneal epithelium forms a lip, which is nonadherent and prevents the lesion to heal (*fig. 1, 3*). The fluorescein will run under the lip of the ulcer and form a halo (*fig. 2*). If the lesion has evolved for a period of time, neovascularisation may appear (in the characteristic form of superficial branch like vessels) (*fig. 4*). Corneal edema may (*fig. 4*) or may not be present. It is important to say that even if this type of pathology was first documented by literature in Boxer dogs, we have diagnosed it in different breeds, including French Bulldog, Chow Chow, Romanian Shepherd and older crossed breed-dogs.

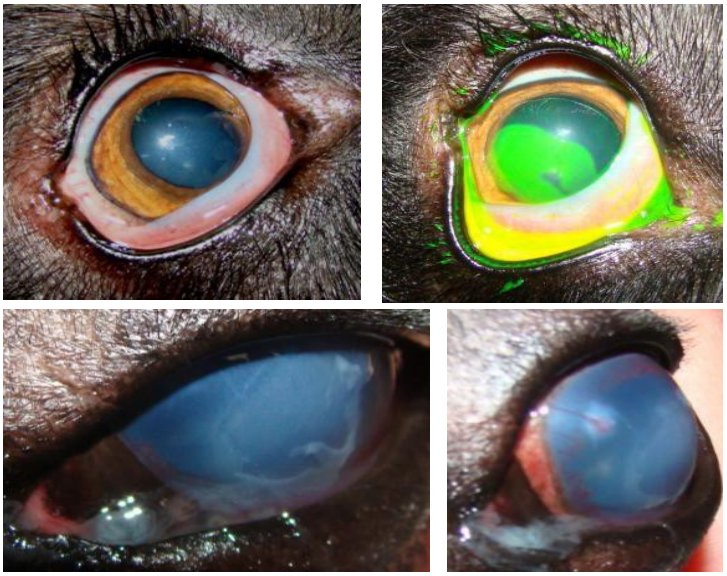

**Fig. 1, 2 –** Right eye of an 8-year old Romanian Shepherd presented for blepharospasm and ocular serous discharge. Fig. 1) Note the epithelial lip visible with the naked eye, lack of corneal edema and neovascularization. Fig. 2) After fluorescein staining, the surface of the ulcer becomes visible, and the dye is infiltrating under the lip.

**Fig. 3, 4 –** Left eye of an 5-year old French Bulldog presented for blepharospasm and ocular mucoid discharge. Fig. 3) Note the epithelial lip very visible at a glance and diffuse corneal edema. Fig. 4) Note the small superficial blood vessels arising from the limbus.

Medical therapy consists of local administration of antibiotics (large spectrum antibiotics in solution are preffered to ointments) and hyaluronic acid ophthalmic gel. These will be applied several times a day, depending on the severity of the ulcer. 5 to 10 minutes should be left between applying different products. Owner compliance is, at this stage, crucial for healing. Topical corticosteroids are avoided at all cost. General nonsteroidal antiinflammatory therapy is considered when pain is present and the animal shows signs of self trauma to the eye. An Elizabethan collar will be applied during the healing process.

Left alone, medical therapy usually gives no results, even when applied for weeks. It may be the cause of frustration for the owner. Time should be spared and surgical gestures are recommended, when the lack of healing is noticed.

After sedation, the first step is to apply a local anaesthetic and manually perform the debridement of the ulcer. For this, a cotton tiped applicator is used (*fig. 5, 7*). The loose epithelium is easily removed, and the area of the ulcer will become bigger (*fig. 6*). This step is very important and will ensure proper healing. If done superficial, the lesion will persist. Therefore, debridment is done all the way from the margins of the ulcer all the way to the corneo-scleral limbus.



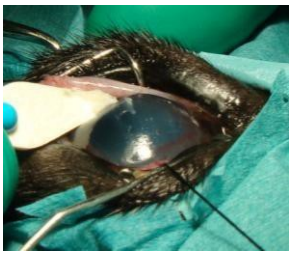

**Fig. 5; Fig. 6; Fig. 7 –** Corneal debridement

After this, using a 25-gauge needle (*fig. 8*), liniar striations are made to the surface of the cornea. Striations will go beyond the new margins of the ulcer, extending to normal epithelium. They must be visible (deep enough) and they should retain fluorescein at the end (*fig. 7*).

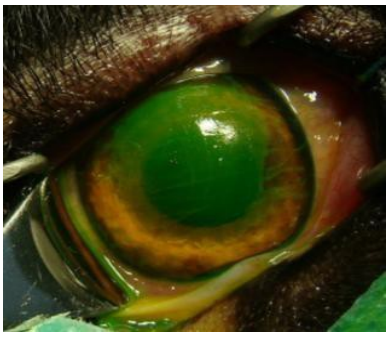
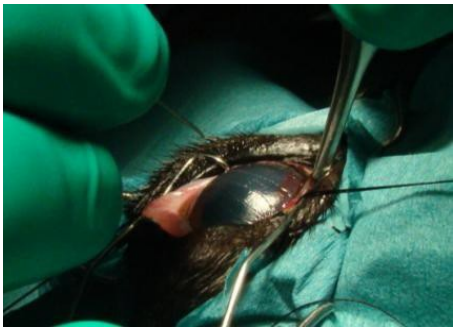

**Fig. 7, Fig. 8 –** Grid keratectomy performed with the tip of the 25-gauge needle

We placed a temporary tarsorrhaphy (3-4 suture points using USP 0 Polypropylene) for all cases of indolent ulcers, to ensure more protection to the cornea and to the healing process (*fig. 9, 10*).

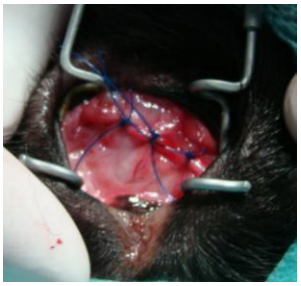
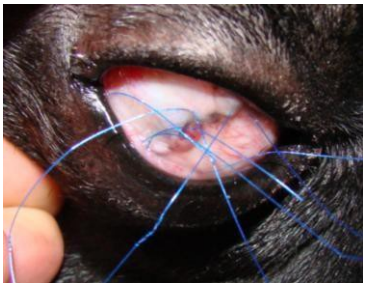

**Fig. 9, Fig. 10 –** Temporary tarsorrhaphy

Local therapy with antibiotics and healing agent (hyaluronic acid, vitamins E&A) has been continued afterwards until removal of the tarsorrhaphy. Sutures were removed after a minimum of 10 days, usually 14 days after the procedure. At this point, the maneuvre was done using local anaesthetic drops and good restraint.

Results have been satisfying in all cases. Healing was achieved by the time sutures were removed (*fig. 11, 12*). However, minimal scarring or corneal melanosis were present in some animals (*fig. 13*). Relapses are uncommon (we haven't noted any during our clinical experience).



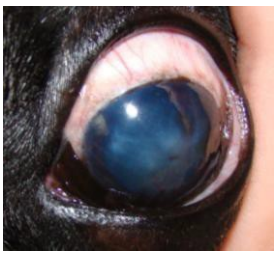

**Fig. 11, Fig. 12, Fig. 13 –** Healing of the indolent ulcer, without any scaring. In fig. 13 we can see some degree of corneal melanosis.

**Conclusions**

1. Indolent ulcers are chronic lesions that should draw the veterinarian's attention if lack of healing is seen after 7-10 days of treatment of a superficial ulcer.
2. Around the ulcer itself, the corneal epithelium forms a lip, which is nonadherent and prevents the lesion to heal.
3. Superficial neovascularization and corneal edema may be present, depending on the duration of the evolution.
4. Medical therapy consists of local administration of antibiotics (large spectrum antibiotics in solution are preffered to ointments) and hyaluronic acid ophthalmic gel.
5. Surgical management consists of corneal debridement, grid keratotomy and temporary tarsorrhaphy.

6. Tarsorrhaphy should be in place for 10-14 days. Healing was achieved by the time sutures were removed.
7. However, minimal scarring or corneal melanosis were present in some animals.
8. Relapses were uncommon (we haven't noted any during our clinical experience).

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