„INDOLENT ULCER" IN BOXER.

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SUMMARY

A case of indolent ulcer in a Boxer is described. An indolent ulcer is a ulcer which fails to heal in the expected time. These ulcers are often breed-related, develop spontaneously and may be considered to represent a primary corneal epithelial or superficial stroma dystrophy. It is caused by a failure of attachment between the basal epithelium to the underlying membrane. There are several methods that will facilitate healing; debridement, keratotomy, superficial keratectomy and medical treatment.

KEYWORDS
Indolent ulcer, keratotomy, keratectomy, refractory ulcer, Boxer ulcer

INTRODUCTION

The normal cornea is a clear transparent structure composed of several layers: epithelium, subepithelial basement membrane, stroma, Descement membrane and endothelium (1). I order to be transparent, the cornea has no blood vessels, lack of pigmentation and a preocular moisture film maintained nonkeratinized surface epithelium (2). The cornea achieves relative transparency at the end of gestation in the dog. Following eyelid opening at approximately 14 days postnatal in the dog, there is an initial decrease in corneal thickness, presumably as the corneal endothelium becomes functional (3). Corneal thickness varies from 0,45 to 0,55 mm centrally and from 0,5 to 0,65 mm in the periphery (2).

The cornea is richly supplied with sensory nerves, particularly pain receptors derived from the ophthalmic division of the trigeminal nerve. The most superficial layers are innervated with pain receptors, whereas more pressure receptors are found in the stroma. This explains why a superficial corneal injury is often more painful than a deeper wound (4).

The cornea serves two functions necessary for vision. First, must serve as a physical barrier of the eye against the external environment and must serve as the major refractory surface of the eye for retinal image formation (5).

The corneal epithelium is thick and is continuous with the conjunctiva. It exists as a simple, squamous, non-keratinized tissue at the surface with the basal cells becoming more columnar and attaching to the basement membrane via hemidesmosomes. In order to maintain smooth ocular surface the epithelium must continually rejuvenate. The half – life of the

epithelial cell is 36-48 hours and the layer can completely replace itself every six to eight days (6).

Any injury involving the cornea can be described as an ulcer. Generally, corneal ulcers are described as superficial or deep, depending on whether they just involve the epithelium or they extend into the middle layer – the stroma (7).

Normally, ulcers involving only the epithelium heal quickly due to the layer's rapid turnover rate. First, epithelial cells around the margin of the wound migrate into the defect in a leapfrog fashion within an hour of injury to cover the defect. Mitosis of the basal layer of cells is initially inhibited and typically begins within 24 hours of injury. The regeneration of the basement membrane occurs slowly and the adherence of the epithelium to the basement membrane via hemidesmosomes is complete for several weeks (5). Injuries that penetrate the stroma heal poorly and are usually refractory to medical therapy alone (1).

An indolent ulcer is an ulcer which fails to heal in the expected time, usually 5 – 7 days (8). Eye affected with indolent ulcers try to grow a new surface over the defect, but the incoming cells fail to stick down onto the layer underneath (stroma). As a result, a thin layer of loose tissue can be see surrounding the ulcerated area. The reason why the cells fail to stick is belived to be mainly because the epithelium cells fail to form tiny "feet" that normally hold on to the tissue underneath (7). The epithelium at the edge of an indolent ulcer is loose and underrun, unable to "stick down' and heal the defect (9).

Indolent ulcers are also known as chronic epithelial erosion, refractory superficial ulcer, Boxer ulcer, recurrent erosion, refractory epithelial erosion and epithelial basement membrane dystrophy (2). These ulcers are often breed-related, develop spontaneously and may eventually affect both eyes. They may be considered to represent a primary corneal epithelial or superficial stromal dystrophy. It is generally believed to be caused by a failure of attachment between the basal epithelium to the underlying membrane, which is either absent or abnormal (1). If no cause of mechanical irritation can be found, a physiological defect in the cornea is the cause of ulceration. There are two classes of corneal diseases: primary epithelial/basement membrane disease leading to loss of adherence of epithelium to stroma and primary endothelial disease leading to loss of regulation of deturgescence of the stroma (5). Primary endothelial disease is typically characterized by pronounced corneal edema and corneal opacity and lead to impairment of epithelial adherence due to the formation of bullae

(bullous keratopathy) in the superficial stroma. These bullae can rupture and lift the epithelium from the stroma forming ulcerations (10).

Certain breed are predisposed to develop indolent ulcers : Boxers, Corgis, Staffordshire Bull Terriers and West Highland White Terriers are often affected. It is usually seen in middle aged to older dogs, without any sex predisposition and can occur in any canine breed. There is no known mode of inheritance (2). Once a dog has suffered an indolent ulcer in one eye, it may develop one in the other eye, or recurrence of ulceration in the first eye (7).

THE PURPOSE

The purpose of our report was to describe the diagnosis and treatment of an indolent ulcer in a Boxer dog.

CASE DESCRIPTION

A 10-years – old, male boxer, was examined at the Surgery, for a unilateral corneal ulcer of the left eye. The ulcer had been diagnosed one month previously by the other veterinarian and treatment had involved topical application of antibiotics, non-steroids agents and 1% atropine. The cause of the initial ulcer was unknown.

In our Surgery ophthalmic examination of the left eye revealed tearing and conjunctival hyperemia. Direct and indirect papillary light responses were normal. The anterior chamber was clear. Schirmer Tear Test (STT-1) in the left eye was 24 mm/min. and measured by Tono-Vet intraocular pressure in this eye was 18 mmHg. Corneal examination revealed big epithelial ulcer with nonadhered epithelium at the margin. In the cornea mild edema, deep vascularisation was observed. This was characterized by an ingrowth of deep blood vessels from the limbus. A delayed vascular response is often seen with chronic lesions (1). Indolent ulcers are usually quite uncomfortable and if left untreated they can persist for many months causing continuous irritation (8).

Dogs with indolent ulcers often manifest photophobia, blepharospasm and epifora (1). Sign of eye discomfort include weeping, blinking, squinting, pawing at the eye and general depression. (7).

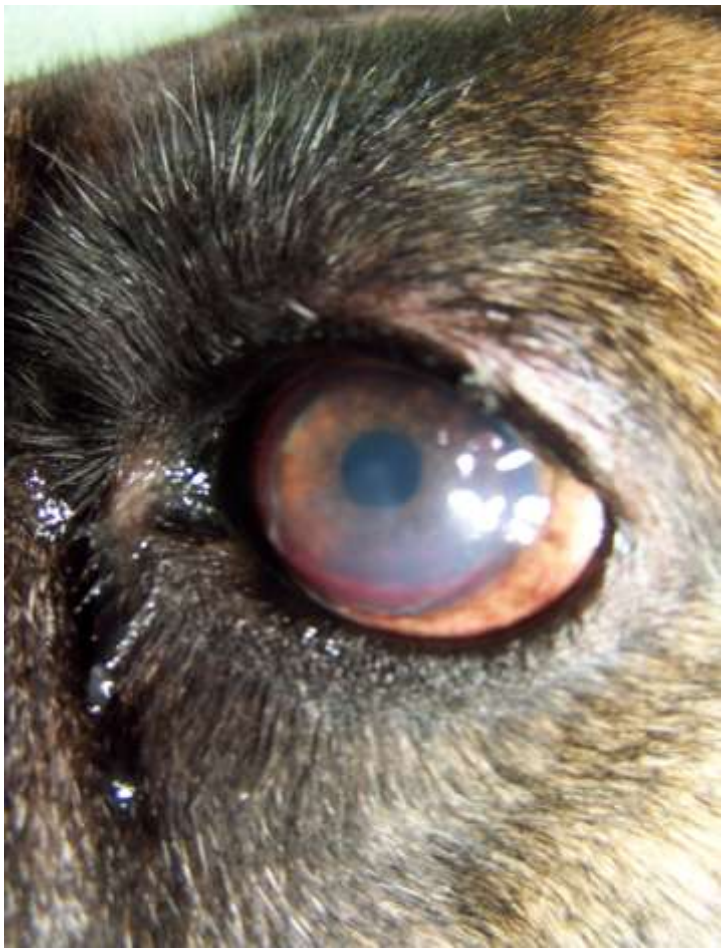

Photo 1. Indolent ulcer in 10 years Boxer (deep vascularisation, corneal edema)

DIAGNOSES

Indolent ulcers can be diagnosed by the appearance of a loose or redundant epithelial margin surrounding the ulcer and by eliminating other causes of superficial corneal ulcers. A fluorescein stain should be always done in the diagnosis. The dye will stain the ulcerated area and also will migrate under the loose flaps of the epithelium. Another test for an indolent ulcer is to rub the margins of a superficial ulcer gently with a dry cotton. If the loose epithelium can be stripped off the test is positive (1).

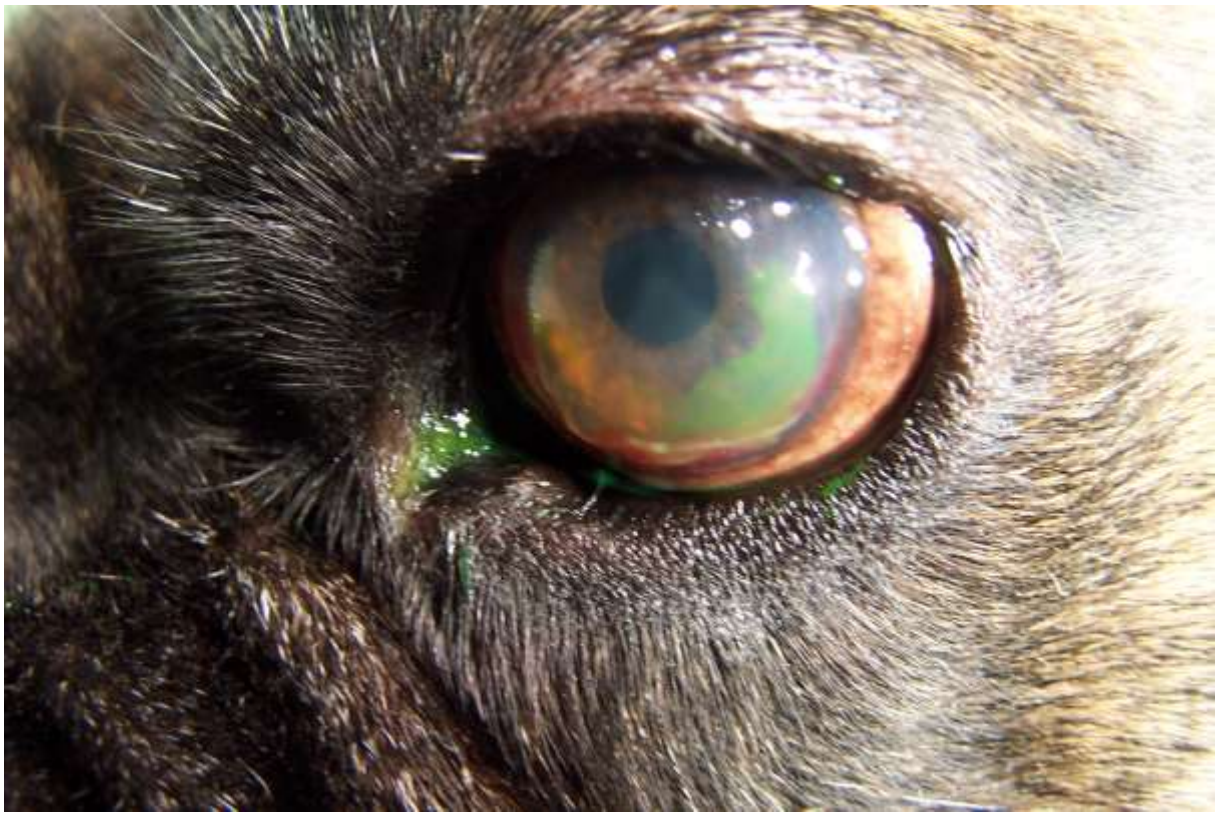

Photo. 2. Fluorescein dye migrates under a loose flap of epithelium.

Differential diagnoses for the persistent epithelial ulcer, based on its clinical appearance, included indolent corneal ulcer, fungal and bacterial keratitis, keratoconjunctivitis sicca and the presence of ectopic cilia or a conjunctival foreign body (1).

TREATMENT

Treatment used for indolent ulcers include surgical epithelial debridement (mechanical or chemical management), grid or punctate keratotomy, keratectomy and medical management (antiprotease, antibiotic agents and non-steroidal anti-inflammatory drugs), (10).

Occasionally these treatments can be performed in some animals using local anaesthetic eye drops but often it is necessary to sedate the patients to avoid undue stress and inadvertent damage to the eye (8).

Our patient was nervous so we decided to sedate him. Microsurgical instruments and an operating microscope was used.

First, the diseased epithelium was debrided with a cotton swab soaked in betadine. The debridement starts at the apparent edge of the ulcer and then continues outwards to the thru edge. This procedures enlarges the original ulcer. After that, the linear (grid) keratotomy was performed. Grid keratotomy was selected because of its superior efficacy over punctate keratotomy (10). Keratotomy was done with a 25 gauge needle. Small parallel incision were made in a grid-like fashion through the epithelium and basement membrane. The purpose was to expose the underlying corneal stroma. Epithelial cells will migrate from these lines and will enhance adherence to the corneal stroma (1). Usually linear incision are placed 1-2 mm apart and must extend about 3 mm into the normal epithelium surrounding the ulcer.

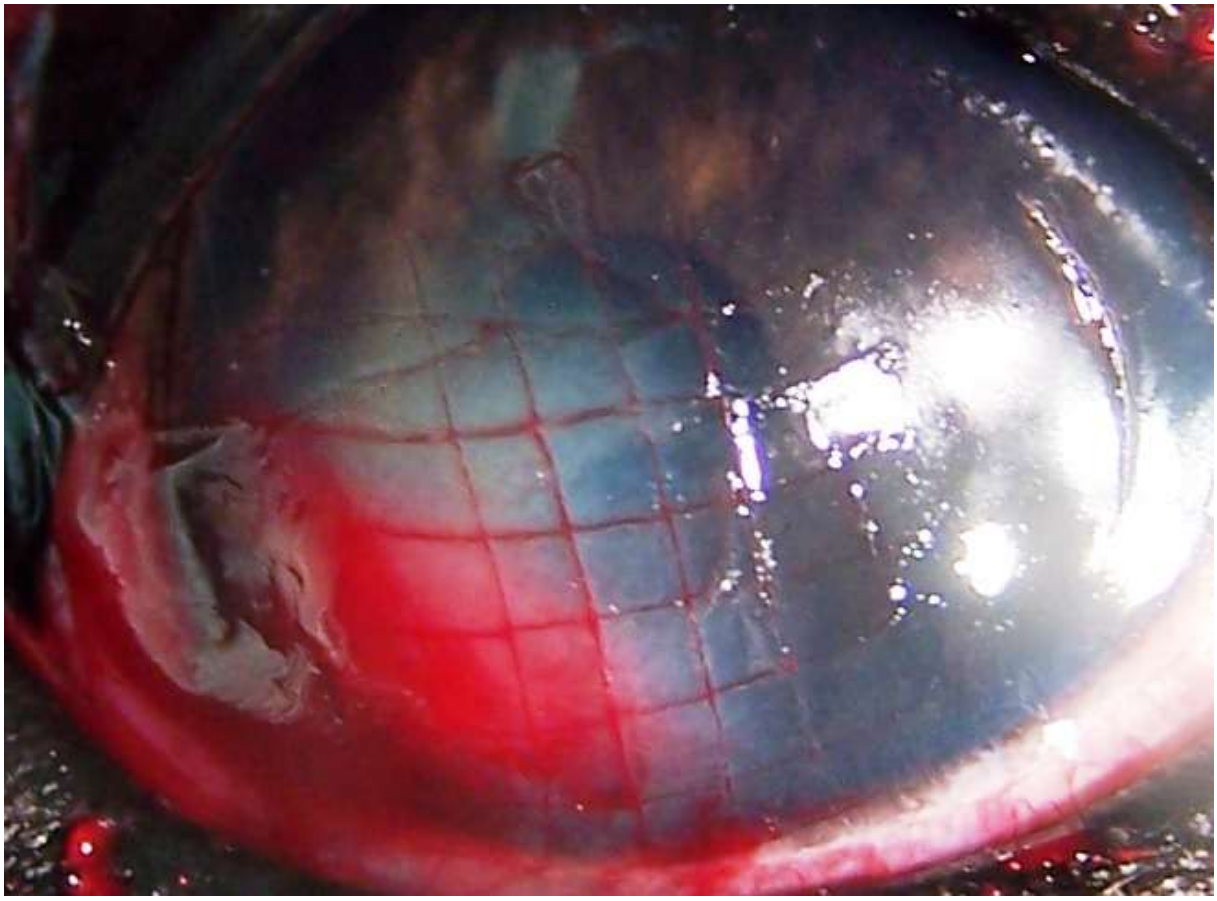

Photo 3. Grid keratotomy.

Because of nervous dog we decided to used for 10 days temporal tharsorhapy to protect the cornea after surgery.

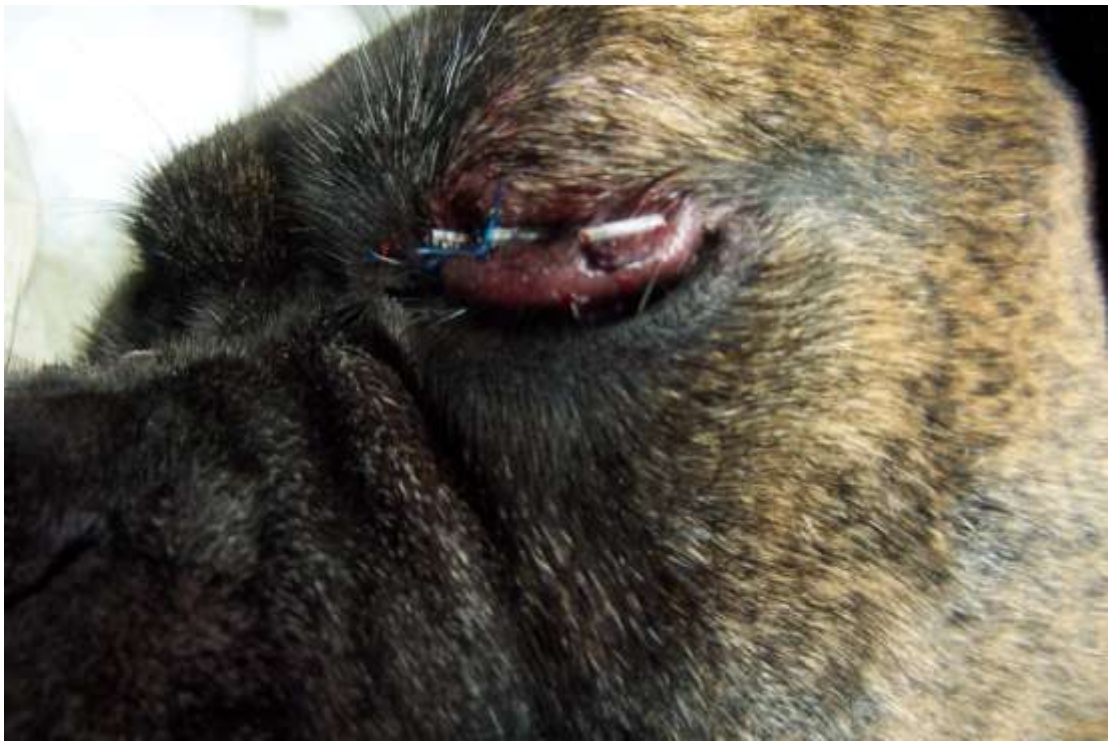

Photo 4. Temporary tharsorhaphy protect cornea after surgery.

Postoperative therapy consisted of systemic cefalexin 15 mg/kg DID and oral carprofen, 4 mg/kg q24h for ten days. Ophthalmic reexamination was performed ten days after surgery.

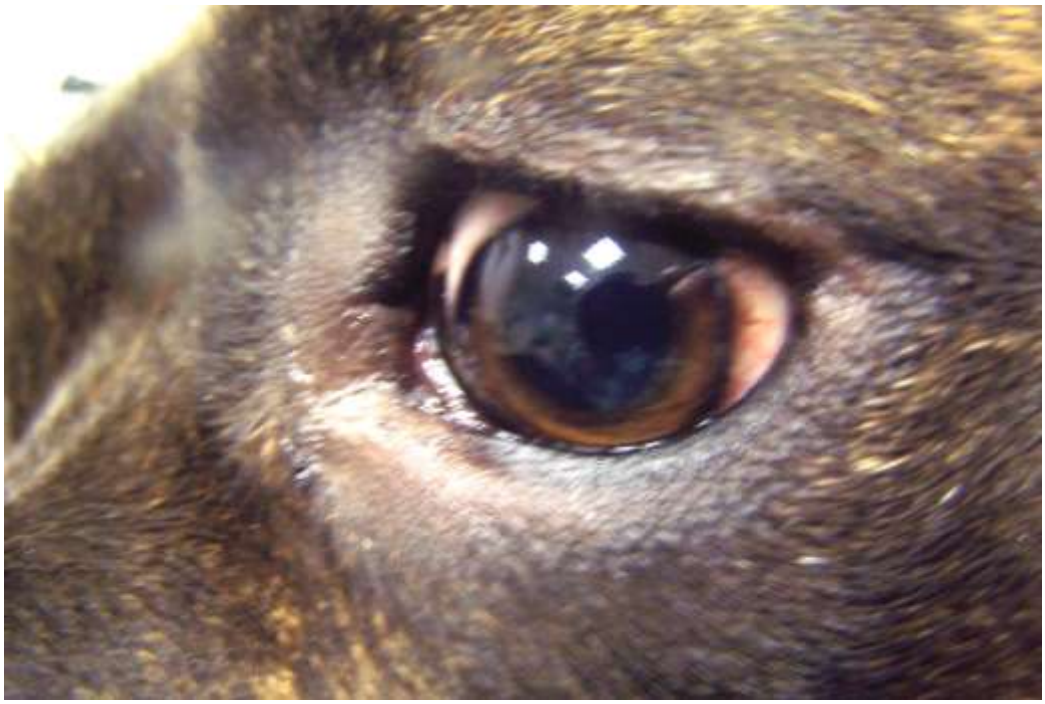

Photo 5. Cornea 10 days after keratotomy.

Debridement with keratotomy combined with temporary tharsorhaphy gave full success of healing indolent ulcer in this patient after one procedure. Most of the superficial ulcers heal without corneal vascularisation, although in same patients blood vessels may become visible at the limbus and continue to migrate across the cornea towards the lesion (1).

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