

Topical Review

Corneal Emergencies

Ellen B. Belknap, DVM, MS, DACVO*



Keywords:
cornea
perforation
ulceration
laceration
trauma

Corneal emergencies can be due to a number of different causes and may be vision threatening if left untreated. In an attempt to stabilize the cornea, it is of benefit to place an Elizabethan collar on the patient to prevent further corneal damage. This article discusses the diagnosis, prognosis, and management of corneal emergencies in dogs and cats.

© 2015 Elsevier Inc. All rights reserved.

Metropolitan Veterinary Referral Hospital,
Akron, OH, USA

*Address reprint requests to: Ellen B. Belknap, DVM, MS, DACVO, Metropolitan Veterinary Referral Hospital, 1053 South Cleveland-Massillon Road, Akron, OH 44321, USA.

E-mail: belknap@yahoocom,
akroneyedocto@yahoocom

Introduction

Corneal damage is a fairly common and potentially vision-threatening condition, which can present as an emergency to the small animal practitioner. Many conditions threaten the transparency of the cornea, whereas others have the potential to result in loss of the eye. The goal of this article is to provide the reader with an overview of the most common corneal emergency conditions. Assessment of their severity, corneal stabilization, therapy, and prognosis for saving vision and the globe are discussed.

The Cornea

The anatomy of the cornea allows light to be refracted and allows enough light to enter the eye for an image to be perceived by the retina. The cornea comprises an outermost epithelial layer, the deeper stroma, Descemet's membrane, and the inner endothelial layer (Fig 1).¹ There is a continuous turnover of the corneal epithelial cells that, in conjunction with the overlying tear film, serve as a defense mechanism of the cornea. In an effort to promote rapid and proper healing, therapy should also be directed to minimize further trauma to the cornea to promote translucency and minimize scarring. Disruption of the corneal integrity may lead to vascularization and pigmentation of the cornea, with malalignment of the corneal collagen fibrils within the stroma, all impairing transparency.

Ulcer

A break in the epithelial layer of the cornea leading to exposure of the underlying corneal stroma results in a corneal ulcer. Superficial ulcers limited to loss of the corneal epithelium are

the most common form of ulceration. As the corneal nerves enter the middle stroma and radiate to the anterior stroma, there is significant pain associated with ulceration of the cornea, which manifests in clinical signs of blepharospasm, protrusion of the nictitans, lacrimation, and miosis. Additional clinical signs of corneal edema, conjunctival hyperemia, photophobia, and, sometimes, aqueous flare may also be observed. Definitive diagnosis of an ulcer is made by topical application of fluorescein dye and its retention by the exposed corneal stroma (Fig 2). Although a tentative diagnosis may be made by observance of a corneal defect, this may be misleading in epithelialization cases with a loss of stromal depth or when excessive vascularization is present, making it appear that an ulcer is still present. Ulcers are further classified according to their depth or their cause.

Superficial

Although these cases are extremely painful and often present as emergencies, they generally are not vision threatening at this point. However, a thorough history and ocular examination should be conducted to determine an underlying cause, if apparent, and the cause should be eliminated to allow for healing and prevent further damage. Keratoconjunctivitis sicca, eyelid deformities, ectopic cilia, distichiasis, foreign bodies (Fig 3), viral infection, repeated trauma (Fig 4), and chemical burns may all be identified as possible etiologies. Without a persistent underlying cause, a superficial ulcer should heal within 2–6 days.¹ Lack of healing within 7 days and the presence of loose epithelium in an old patient suggests a nonhealing ulcer or spontaneous chronic corneal epithelial defect, which requires specific treatment.

Treatment should be directed to alleviate any underlying cause, promote comfort and healing, and prevent a deeper bacterial infection. Topical antibiotics commonly used for superficial ulcerative keratitis include tetracycline or a combination of neomycin,

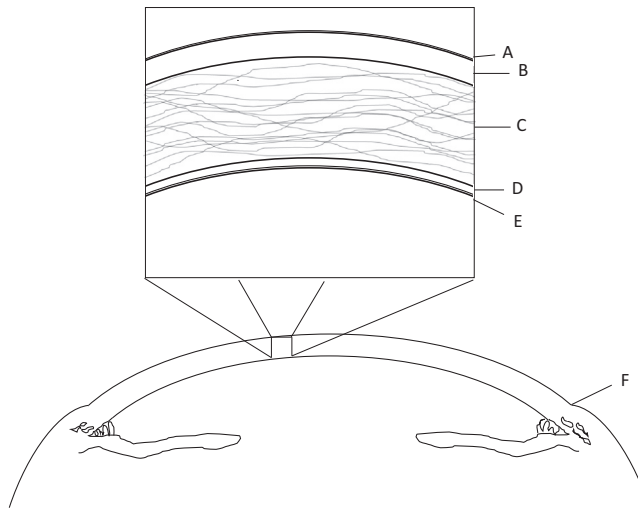


Fig. 1. Diagram of a canine cornea consisting of (A) tear film layer, (B) epithelium, (C) stroma, (D) Descemet's membrane, (E) endothelium, and (F) limbus.

polymixin B, and bacitracin. Superficial pain receptors in the cornea stimulate a neurogenic reflex, resulting in discomfort, miosis, and reflex uveitis. A mydriatic agent, such as 1% atropine sulfate, is applied every 12–24 hours to alleviate ciliary muscle spasm, minimize posterior synechiae development, and to stabilize the blood-aqueous barrier when secondary uveitis is present.² Nonsteroidal anti-inflammatory drugs (NSAIDs) may be used topically, with discretion as reports exist of associated corneal melting in humans,³ or systemically to treat concurrent ocular inflammation. Inflammation is present in the cornea due to the ulcerative keratitis and release of inflammatory mediators during the acute phase. Limiting inflammation is critical to minimizing vascularization, fibrosis, and pigmentation of the cornea as well as preventing synechiae and glaucoma. Although having greater anti-inflammatory properties, topical steroids, for their anti-inflammatory properties, are contraindicated in ulcerative keratitis due to inhibition of corneal healing and limiting defense mechanisms of the cornea. Commonly used topical NSAIDs for ophthalmology include diclofenac, flurbiprofen, and ketorolac, generally administered once to twice daily to treat ocular inflammation.

Chemical-induced ulcers are acute with severe blepharospasm, edema of the eyelids, conjunctival hyperemia and chemosis, and

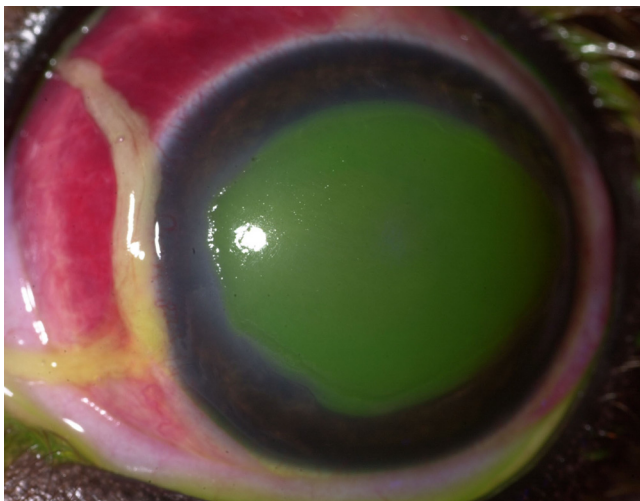


Fig. 2. Retention of topically applied fluorescein dye by the corneal stroma confirms diagnosis of superficial corneal ulcer.

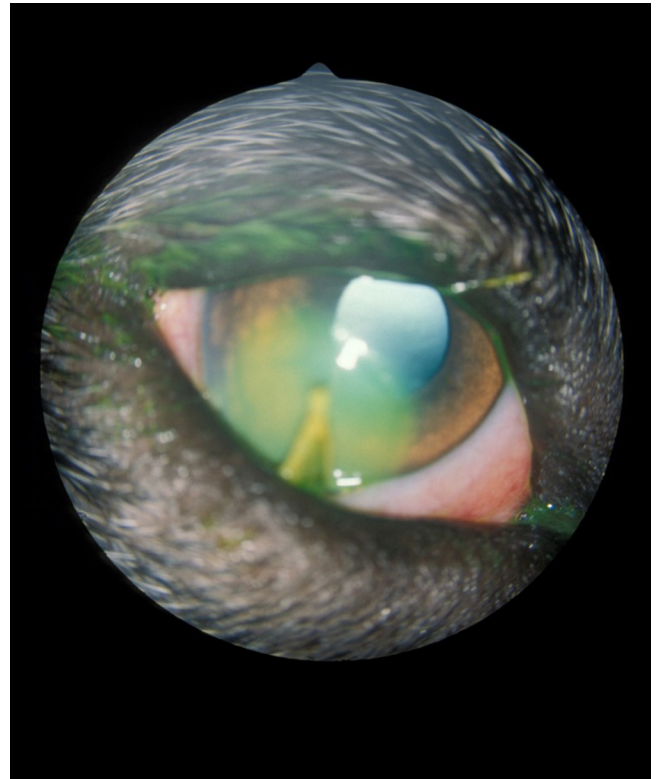


Fig. 3. A superficial ulcer with a foreign body identified. Removal of the foreign body resulted in healing of the ulcer within 36 hours.

corneal edema, and generally they rapidly progress to include the entire epithelial layer of the cornea (Fig 5). In most cases, there is a suggestive history of an encounter with a chemical—either alkaline or acidic. Initial treatment should be to rinse with tap water in cases of alkaline exposure, followed by serum and topical antibiotics every other hour as further loss of epithelium continues and corneal stromal destruction occurs.⁴ In contrast, acidic chemicals tend to cause superficial and nonprogressive ulcers due to coagulation of proteins in the epithelial layer. A broad-spectrum fluoroquinolone antibiotic, such as ofloxacin 0.3%, is suggested in these cases along with mydriatics, systemic anti-inflammatory drugs, and oral doxycycline. Due to the intense pain associated with this



Fig. 4. A superficial ulcer in a canine patient resulting from trauma due to suture material observed on the bulbar aspect of the nictitans from a previous surgery.

Download English Version:

<https://daneshyari.com/en/article/2401018>

Download Persian Version:

<https://daneshyari.com/article/2401018>

[Daneshyari.com](https://daneshyari.com)