

# Corneal Ulcers

## BASIC INFORMATION

### Description

A corneal ulcer occurs when the protective surface layer of the cornea is lost. The deeper layers of the cornea are exposed and become prone to infection and injury. These deeper layers contain many nerves, and irritation of these nerves is very painful.

Corneal ulcers range from superficial abrasions and small circular lesions to deep craters that may perforate. Ulcers may be complicated by secondary bacterial infections and by severe inflammation of the eye.

### Causes

Many different causes exist, including trauma (such as cat scratches or foreign bodies), abnormalities of the eyelids (entropion, extra or abnormal eyelashes), decreased blinking (during sedation or general anesthesia, neurologic problems), and exposure to irritants (chemicals, soaps, heat or flame).

Infections with bacteria, viruses, or fungal agents can cause ulcers. The presence of dry eyes or calcium infiltrates and edema (water retention) in the cornea can also predispose to ulceration. Dogs with short, flat faces and prominent eyes are very prone to corneal ulcers, because their eyes are large and protrude beyond the eyelids. These dogs also have poor sensation (feeling) in the central cornea and blink less often than other dogs.

### Clinical Signs

Pain is a hallmark sign of corneal injuries and ulceration. It is manifested by tearing, squinting, blinking, and sometimes pawing at the eye. The animal may also be quiet and withdrawn. The eye is usually red. Thick discharge may develop with infection. The cornea may be cloudy or have visible irregularities. Other signs, such as swelling of the eyelids, inward rolling of the eyelid, protrusion of the third eyelid, or bruising around the head, may occur depending on the cause. Signs of upper respiratory tract infection may be noted in cases of herpesvirus infection in cats or distemper virus infection in dogs.

### Diagnostic Tests

The presence of a corneal ulcer is confirmed by close examination and fluorescein staining of the cornea. Installation of a local anesthetic drop to numb the eye may be needed prior to examination.



Other ocular testing, such as a Schirmer tear test, testing of reflexes, examination of the eyelids and interior of the eye, and glaucoma testing, may also be indicated. If a bacterial infection is suspected, a culture of the eye may be submitted.

## **TREATMENT AND FOLLOW-UP**

### **Treatment Options**

Many ulcers can be treated on an outpatient basis, but hospitalization may be recommended for severe ulcers. Treatment can involve medications, surgery, and other measures, depending on the type and severity of the ulcer. Medications are applied to all ulcers:

- Topical antibiotics are administered to treat active infections and/or to prevent infections. If the ulcer is deep and there is concern about infection within the eye, then oral or injectable antibiotics may also be given.
- Topical atropine (pupil dilator) or other pain medications (nalbuphine, morphine) may be given, as needed.
- Topical and/or oral antiviral and antifungal medications are given for those infections.
- Oral nonsteroidal anti-inflammatory drugs may be considered for marked inflammation and discomfort, especially in dogs. Newer medications also can fill in corneal defects will collagen.

Ancillary measures include application of an Elizabethan collar to prevent self-trauma, application of soft contact bandage lenses, placement of a third eyelid flap to protect the cornea, and administration of the pet's own serum (used mainly for soft, melting ulcers). Surgical correction of any underlying causes, such as entropion correction or removal of foreign bodies or abnormal lashes, is also beneficial.

If the ulcer is deep enough to weaken the cornea, then supportive surgical techniques are often performed. These include various types of grafting techniques that use either conjunctival tissue from the animal's eye or harvested tissue from another animal. Small, deep lesions can sometimes be directly closed by suturing the edges together.

### **Follow-up Care**

Recheck visits are needed to assess healing and response to treatment. Visit frequency can range from every 24-48 hours to every 7-14 days, depending on the severity. Fluorescein staining of the cornea is done at most visits to highlight the ulcer and to determine when it has healed.

### **Prognosis**

Most superficial ulcers and abrasions heal quickly, with minimal scarring. Deep ulcers and ulcers that are infected are more difficult to treat, and secondary changes such as inflammation within the eye or scarring and pigmentation of the cornea can decrease vision. Certain bacteria produce substances that can melt the cornea, sometimes resulting in perforations and loss of vision and the eye. Ulcers that require surgical grafting often must be treated and monitored carefully for several weeks.