



Animal Eye Clinic

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FELINE CORNEAL SEQUESTRUM

What is a corneal sequestrum?

Corneal sequestration is a condition peculiar to the cat in which corneal stromal necrosis occurs.

The cornea is the transparent layer located at the front of the eye. It is about 1mm thick and consists of four layers: epithelium, stroma, Descemet's membrane, and endothelium.

In a sequestrum the collagen within the stroma degenerates. Within this dead stromal tissue, brown pigment accumulates leaving the affected area stained light brown to dark black. In many cases the pigmented area will slough off and leave a corneal ulcer with a pigmented crater.

Various names have been given to this lesion since its first description in 1965. These include corneal mummification, the isolated black lesion, corneal nigrum, keratitis nigrum, focal degeneration of the cornea, corneal necrosis, primary necrotizing keratitis and corneal sequestration or sequestrum.

What are the causes of corneal sequestra?

The particular cause of a corneal sequestrum is unknown. Some authors suggest that they are caused by a primary corneal dystrophy. Others propose that certain factors make the cornea vulnerable to the development of a sequestrum.

Some of these factors include:

- **Heredity:** There is a noticeable breed distribution in the incidence of corneal sequestra. The Persian, Siamese, and Himalayan breeds are well represented. However, to a lesser degree, domestic breeds may also be affected. It is unknown if this breed predisposition is a result of genetics, or if it is related to their similar facial features.
 - **Incidence of corneal sequestrum by breed:**
 - Himalayan 35%
 - Persian 35%
 - Siamese 15%
 - Domestic 10%
 - Abyssinian 5%
- **Conformation:** The commonly affected breeds show similar facial feature which may predispose them to ocular irritation and trauma. Exophthalmia (protruding eyeball), lagophthalmos (inability to close the eyelid completely), and medial entropion (rolling in of the eyelids) are all features of the affected breeds.
- **Ocular irritation and trauma:** Are common factors in the histories of affected cats. The above conformation problems may predispose these animals to chronic irritation and subsequent corneal microtrauma.
- **Feline Herpes Virus (FHV-1):** It is estimated that more than 95% of cats are infected with FHV-1. Carriers may shed the virus intermittently throughout their life, especially in times of stress. The virus can live in the nervous tissue within the cornea, which is why there has been a connection made between corneal sequestra and FHV-1.

Corneal sequestra may be seen in cats of all ages, with the exception of neonates. In most cases, a sequestrum will first appear in young adult cats. There does not seem to be any sex predilection in affected cats.

What will I see if my cat has a corneal sequestrum?

In most cases, the clinical presentation of a corneal sequestrum begins with a history of chronic ocular disease. Affected cats may exhibit any combination of the following symptoms:

- blepharospasm (squinting),
- excessive lacrimation (tearing),
- protrusion of the third eyelid,
- corneal ulceration with neovascularisation,
- corneal lesions:
 - usually central but may be off center,
 - round or oval shape,
 - faint yellow-brown staining to raised brown-black plaque,
 - fluorescein uptake at periphery of the lesion,
 - superficial vascularization of cornea.

A patient may or may not show signs of discomfort. As sequestra progress they become denser, acquire distinct borders, and separate from the adjacent and underlying stroma.

Due to the link between corneal sequestra and FHV-1, a polymerase chain reaction (PCR) test for feline herpes virus is recommended for cats who have been diagnosed with a corneal sequestrum.

What treatment is available for corneal sequestra?

The treatment of corneal sequestra in the cat varies considerably between ophthalmologists. Depending on the presentation, some may adopt a conservative approach to management. In these cases, the ophthalmologist may allow the sequestrum to slough off on its own. They may prescribe topical antibiotics and artificial tears. This will reduce the risk of a secondary infection, and increase the cat's comfort level in the meantime. Extrusion (sloughing) may take months to years and thus therapy and ocular pain may be prolonged. Frequent rechecks will be necessary in order to monitor the progression of the sequestrum.

In other cases, surgical removal of the sequestrum by keratectomy may be warranted. The main advantage of surgical excision is a significant shortening of the course of the disease. Superficial sequestra may be removed using a superficial keratectomy with or without the placement of a conjunctival graft, corneal graft, or heterologous membrane. Deeper sequestra are removed using a keratectomy with the placement of a conjunctival graft, corneal graft, or heterologous membrane. Although grafts will result in scarring of the cornea, they are necessary in order to provide structural strength and vasculature to the cornea. Recurrence of a sequestrum is possible, but it is more common in cases where a grafting procedure has not been performed.

Medical management is necessary after surgery and involves the use of topical antibiotics, topical atropine and artificial tears. An Elizabethan collar must be kept on the cat at all times in order to prevent self-trauma. A number of recheck appointments will be necessary to monitor recovery. Postoperative complications include: infection, suture dehiscence, and recurrence of sequestra.