

# Ophthalmology Teatime Teaser



## Susan Manning

BVSc (Hons) DVOphthal MRCVS  
*Royal College Recognised Specialist in Veterinary Ophthalmology*

Sue graduated from Bristol Vet School a long time ago! She has worked in both mixed and small animal general practice for 16 years. Sue completed an RCVS ophthalmology residency in the midlands and gained the Diploma in 2006. She joined Pride Veterinary Centre in 2011 and is involved in both undergraduate and post-graduate teaching. She has presented at national and international veterinary ophthalmology meetings and is a BVA/KC/ISDS Eye Panellist.



## Stephanie Veitch

DVM MRCVS

Stephanie graduated from Szent István University, Budapest in 2014. She worked as a first opinion vet for nearly 3 years and then joined Pride Veterinary Centre in 2017 to complete a 12-month rotating internship. During this time, she developed a keen interest in Ophthalmology and has just completed a second 12-month internship in Small Animal Ophthalmology. Stephanie is currently studying towards a BSAVA Postgraduate Certificate in Small Animal Ophthalmology.

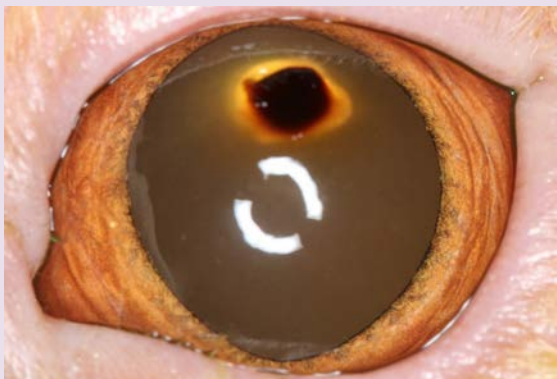


Figure 1



Figure 2

## Test yourself with these Teatime Teaser questions

**Q1. What is wrong with the cat's cornea in Figure 1?**

- a) Foreign body
- b) Infected ulcer
- c) Sequestrum
- d) Melanoma
- e) Haemorrhage

**Q2. Why might this happen?**

- a) Breed predisposition
- b) Feline Herpes Virus
- c) Entropion
- d) Corneal exposure
- e) All of the above

**Q3. What medication would you use in this case?**

- a) Antibiotic alone
- b) Antibiotic and lubrication
- c) Lubrication alone
- d) Optimune®
- e) Corticosteroids
- f) Remend corneal repair gel®

**Q4. Would you perform surgery in this case?**

- a) No, medication alone can resolve this
- b) No, I would perform a grid keratotomy to aid healing
- c) Maybe, if it was bothering the cat
- d) Yes, if not surgically excised it could get deeper and rupture the eye
- e) Yes, it seems superficial and easy to remove

**Q5. What surgical procedure(s) would be indicated for this cat?**

- a) Debridement and grid keratotomy
- b) Entropion correction alone
- c) Lamellar keratectomy and conjunctival pedicle graft or corneo-conjunctival transposition combined with entropion correction

- d) Lamellar keratectomy and conjunctival pedicle graft or corneo-conjunctival transposition alone

**Q6. What is wrong with the cat's cornea in Figure 2?**

- a) Eosinophilic keratitis
- b) Neoplasia
- c) Previous corneo-conjunctival transposition graft
- d) Foreign body with associated corneal neovascularisation
- e) Nematode larva

Answers on  
the next  
page

### Q1. What is wrong with the cat's cornea in Figure 1?

**Answer: C** – This is a corneal sequestrum. Sequestra start with a faint amber discolouration of the corneal stroma which progresses, over a period of days to weeks, to a darker and potentially larger and deeper plaque of denatured and black cornea. Depending on the stage of progression, this condition may or may not be painful, be associated with corneal ulceration or corneal neovascularisation. This cat also has medial lower eyelid entropion.

### Q2. Why might this happen?

**Answer: E** – The condition is poorly understood but several predisposing factors have been highlighted as playing a role in the development of corneal sequestra in cats. These include chronic corneal irritation (secondary to exposure, poor tear film quality, dry eye or trichiasis (entropion, dermoid, eyelid agenesis, post-traumatic or post-surgical eyelid misalignment), following grid keratotomy, feline herpes virus and chronic corneal ulceration) (see *Figures 3-7*). Any cat can develop a sequestrum, but certain breeds are predisposed including

the Persian, Himalayan, British Short Haired and Burmese, although this may be due to conformation rather than breed (i.e. brachycephalic cats have medial lower eyelid entropion and corneal exposure).

### Q3. What medication would you use in this case?

**Answer: B** – Antibiotic and lubricating ointments can be used to prevent infection and reduce irritation until either surgery can be performed or the sequestrum has spontaneously sloughed. A virostatic drug like famciclovir may also be used if feline herpes virus is suspected.

### Q4. Would you perform surgery in this case?

**Answer: D** – Yes, surgery would be recommended in this case. Some sequestra can slough but there is a risk the sequestrum may progress deeper into the cornea and, if it then sloughs, corneal rupture can result (see *Figures 8,9 and 10*).

It is also very difficult to assess the depth of this sequestrum, as you cannot see through the dense black plaque, meaning it could already be very deep and close to rupture. Surgery consists of a lamellar keratectomy to remove the sequestrum in its entirety. Depending on the depth of the keratectomy, tectonic support in the form of a conjunctival pedicle or corneo-conjunctival transposition graft may be indicated.

### Q5. What surgical procedure(s) would be indicated for this cat?

**Answer: D** – In this case a lamellar keratectomy (to excise the sequestrum) followed by a conjunctival pedicle graft and correction of the entropion (via a modified

Hotz-Celsus technique) was performed (see *Figure 11*). A corneo-conjunctival transposition would have also been a suitable surgical technique. Although the entropion was not an obvious inciting cause for this sequestrum (due to the location), this cat was very young and there was a concern that, if not corrected, this could be the cause of a future sequestrum.

Sequestra can occur in both eyes and they can recur in the same eye. Recurrence is associated with failure to remove the inciting cause and incomplete surgical removal by keratectomy without concurrent grafting. It can also occur if the conjunctival pedicle graft (if used) dehisces or if the pedicle to the graft is sectioned. For these reasons conjunctival pedicle grafts are made very thin to limit the opacity in the visual axis, as they are not sectioned and will always remain in place. Further examples of conjunctival pedicle grafts can be seen in *Figures 12 and 13*.

### Q6. What is wrong with the cat's cornea in Figure 2?

**Answer: C** – This cat had a previous sequestrum removed via lamellar keratectomy and the corneal deficit repaired via corneo-conjunctival transposition graft. You can see the dark line of the limbus which has been transposed towards the axial cornea and corneal neovascularisation. This is a successful surgical outcome following treatment for a corneal sequestrum. See *Figure 14* for an example of what this graft could look like in time.

Reason to refer

#29

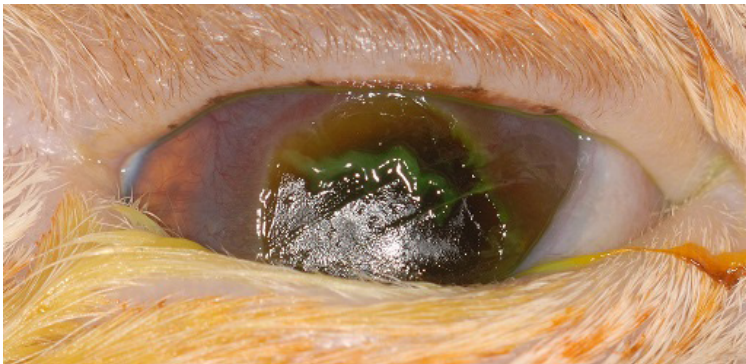
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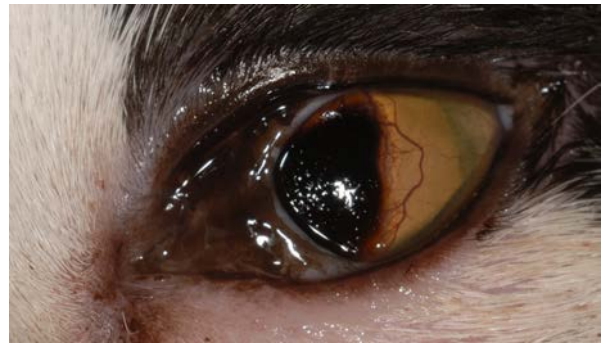
**Figure 3** Axial horizontal corneal sequestrum secondary to corneal exposure in a brachycephalic cat



**Figure 4** Feline eye with a large lateral corneal sequestrum secondary to lower eyelid entropion



**Figure 5** Feline eye with large corneal sequestrum over which there are visible grid keratotomy lines. There is also lower eyelid entropion. The entropion may have been the primary cause of the sequestrum or could be spastic as a result of ocular pain. It is unclear if the grid keratotomy had been performed before or after development of the sequestrum; either way it is not an appropriate procedure to perform on a cat's cornea.



**Figure 6** Feline eye with symblepharon (adhesion of the third eyelid conjunctiva to the bulbar conjunctiva), indicating previous Feline Herpes Virus infection, making this the likely cause for sequestrum formation in this case.



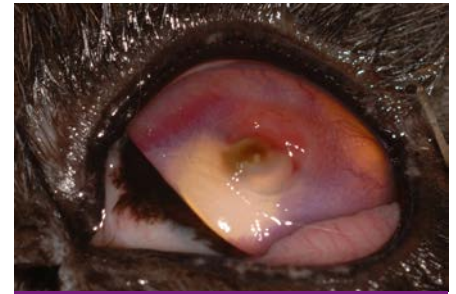
**Figure 7** Superficial corneal ulcer with associated corneal vascularisation and stromal sequestrum formation in a brachycephalic eye. The advanced corneal neovascularisation indicates chronicity and this may be the result of exposure, given the breed.



**Figure 8** Domestic short haired cat with para-axial corneal sequestrum that is starting to slough ventromedially.



**Figure 9** Feline eye with an sequestrum which is sloughing and has a prominent vascular response.



**Figure 10** Feline eye showing a sequestrum which has only partially sloughed leaving a deep stromal ulcer. The dorsal edge of the sequestrum has remained in-situ. There is an advanced vascular response and diffuse corneal oedema.



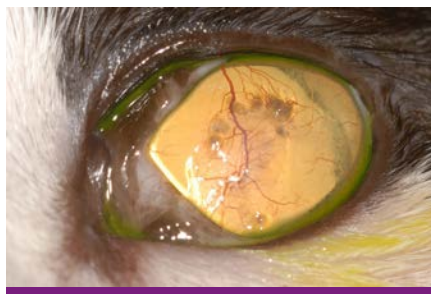
**Figure 11** This is the same eye as in *Figure 1* two weeks after surgery. This photo shows the square edges of the keratectomy site, peri-limbal corneal neovascularisation, a dorsal conjunctival pedicle graft sutured into the deepest part of the corneal stromal deficit, and correction of the previous medial lower eyelid entropion. The graft will become less red once the corneal sutures have resorbed, which usually takes approximately 6 weeks.



**Figure 14** Corneo-conjunctival transposition graft showing a clear visual axis following regression of the corneal neovascularisation.



**Figure 12** Conjunctival pedicle graft after all sutures have been resorbed.



**Figure 13** This is the same eye as in *Figure 6* following excision of the herpes induced sequestrum and placement of a thin conjunctival pedicle graft.

**Reason to refer**

**#38**

We support your client after discharge to ensure that their pet makes the best recovery possible