Bilateral glaucoma implants resolve medication based anxiety in a cat

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Case summary

A 16 month old speyed female Siamese cat was treated for doxycycline responsive blepharo-conjunctivitis and low tear production. During routine follow up mildly increased intraocular pressure (IOP) was found at 26 months of age. Glaucoma treatment was started 3 months later.

IOP was controlled medically with timolol/dorzolamide (Cosopt/Cosdor, Viatris) for 17 months, when uncontrolled high IOP demanded a surgical alternative. The cat was also running away from her owner and hiding due to medication anxiety, and the owner decided surgery may be a better alternative than medication.

Molteno glaucoma implants were implanted first in the left eye then the right. The design, implantation, and post operative findings of the molteno shunt are discussed.

One month post surgery inflammation was negligible and IOPs were well controlled. The only medication was ketorolac (Acular, Abbvie)) once daily OU. Two months post surgery the cat was happier, more playful and had put on weight. 9 months post surgery the owner said "She no longer runs away in the mornings because she doesn't need drops all the time. Shunt surgery was the best thing ever"

Six years post surgery both eyes were normotensive, visual and comfortable with intermittent cyclosporine ointment the only medication, used to maintain a good Schirmer tear test and keep the eyes comfortable and free of discharge.

Discussion

Clinical signs of glaucoma in cats are more subtle than in dogs. Measurement of intraocular pressure is essential for diagnosis and treatment as the more obvious clinical signs frequently seen in dogs such as corneal oedema and episcleral congestion are rarely seen in cats until late in the disease[1], if at all. Frequently cats are not presented for examination until sufficient optic nerve damage has occurred to cause anisocoria, or chronic raised intraocular pressure has resulted in buphthalmos.

This case is unusual in that we were able to follow this cat from before the development of glaucoma, through the stages of medical treatment, then surgical treatment, and ultimately to long term control of the glaucoma.

Cats are also unlike dogs in that they do not accept treatment readily, and their resistance to treatment is rarely mollified with treats. It is common for cats requiring long term treatment to hide and become reclusive, and the pet/owner relationship is less enjoyable. This was the case with our patient, and the use of a surgical solution ultimately reduced the need for medical treatment and the pet /owner relationship was restored.

Glaucoma in cats is often secondary, although primary glaucoma has been reported in the Siamese[2], Burmese[3] and Persian and European Short Hair breeds[1]. In our patient the only previous ocular condition was conjunctivitis, which was treated and resolved months before the glaucoma was diagnosed, so this is a primary glaucoma.

Primary glaucoma caused by a mutation in the LTBP2 gene has been reported in Siamese cats[2] but it is a congenital condition, and elevated intraocular pressure, globe enlargement, and elongated ciliary processes are consistently observed in affected cats by 8 weeks of age.[2] Our patient did not have any of these signs at first examination, and she did not develop raised intraocular pressure until she was 25 months of age, so it is unlikely this glaucoma was caused by the LTBP2 mutation.

Gonioscopy showed a narrow angle, which did not permit examination of the iridocorneal angle and pectinate ligaments. In Siamese cats with the LTBP2 gene mutation, gonisocopy shows open or slightly narrowed iridocorneal angles with subtle dysplasia of the pectinate ligament.

Ultrasonography of the iridocorneal angle was hampered by the small deep-set eyes, and good images were not obtained.

It is interesting that exacerbation of the glaucoma occurred whilst our cat was being treated for a second episode of conjunctivitis with topical prednefrin actetate drops (Prednefrin Forte, AbbVie). Some normal cats will respond to corticosteroid treatment with an insignificant and reversible increase in IOP[4], but the increase in glaucomatous cats can be significant[5]. Our patient had no topical corticosteroid for at least four months prior to the first detection of elevated IOP, so the glaucoma was not caused by corticosteroid administration, but may have been exacerbated by the second course of corticosteroid administration. Revision of corticosteroid use should be considered in cats with glaucoma.

Feline glaucomas are difficult to treat because whilst they often respond to carbonic anhydrase inhibitors and / or timolol in the initial stages, as the disease progresses, effective drug options are limited. Prostaglandin analogues, whilst very useful in dogs, are mostly ineffective for lowering IOP in cats, and intense miosis can occur[1] which can be painful. The lack of response to prostaglandin analogues is proposed to be because the component of uveoscleral outflow is only 3% in cats, vs 15% in dogs[6]. McLellan and Miller [1] in Feline Glaucoma, a comprehensive review, state that latanoprost, travoprost and bimatoprost have no significant IOP lowering effect in normal cats, but close examination of the references quoted reveals no mention of travoprost[7]. Similarly, I have not been able to find any references on the IOP lowering effects of travoprost in cats, however, in practice I have found travoprost (Travatan, Novartis) to be very useful, sometimes as a sole therapeutic agent, but I had not discovered that at the time of treating this patient, so in desperation we tried bimatoprost (Lumigan, AbbVie) instead.

For feline glaucoma that is unresponsive to medical interventions, surgical options are available. For sighted eyes these options include gonioimplantation or cyclodestructive procedures. Cyclodestructive procedures involve either laser cyclophotocoagulation or cyclocryotherapy[8]. As laser energy is primarily absorbed by pigment, this procedure is

likely to be of little benefit in the subalbinotic eye such as if found in Siamese cats, particularly in the blue and lilac coat colours. Cyclocryotherapy success rates are lower for cats than in dogs and repeat treatments are often required.[1]

There are limited reports on gonioimplantation in the cat[9], but in Veterinary Clinics of North America, McLellan describes gonioimplantation for cats as being challenging, largely because feline eyelids are tight and the orbit is small.[10] Buphthalmos further reduces room in the orbit. Our cat did not have buphthalmos and implantation of the gonioimplant was not difficult but indentation of the posterior globe by the shunt and bleb was noted as a long-term effect. This is a finding not observed in any of our canine shunt patients, and is likely to be caused by limited space within the feline orbit for the filtering bleb. We do not know whether the indentation of the wall of the eye had a detrimental effect on vision, but the indentation was similar to what would be expected with a scleral buckling procedure for treatment of localised retinal detachment. Retinal disease was not observed over the indented area

In this case of early detected primary narrow angle glaucoma, implantation of bilateral Molteno gonioshunts has maintained vision and a normal IOP for almost 6 years, without the need for ongoing medication for glaucoma control. This has restored the pet – owner relationship.

Use of gonioshunts should be considered for visual non-buphthalmic feline eyes, especially when the patient has developed medication based anxiety.

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