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LASER TREATMENT OF IRIS CYSTS IN A FLAT COATED RETRIEVER

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Abstract

Uveal cysts are fluid filled structures arised from the iris or ciliary body commonly presented in certain breeds such as Golden retriever, Labrador retriever and Boston terrier. This report describes the clinical signs, the laser technique and the postoperative aspect for a Flat Coated Retriever with iris cysts. A 6 year-old, neutered male Flat Coated Retriever was referred to the Animal Medical Centre with a history of two pigmented masses in the anterior chamber. Ophthalmic examination of the right eye showed the presence of two highly pigmented iris cysts attached at the pupillary margin to the posterior iris. Nonsteroidal eye drops (ketorol tromethamine) and a course of oral meloxicam were initiated a week before the procedure. Under general anaesthesia the diode laser was used with an indirect ophthalmoscope headset and a 20 diopter lens. Preoperative atropine and proxymetacaine eye drops were applied. Diode laser was used to deflate the cysts. Initial pigment dispersion in the anterior chamber and on the surface of the lens was noted. Topical nonsteroidal, steroidal and antibiotics (dexamethasone, polymyxin and neomycin) eye drops were continued to control the secondary uveitis. Clinical progress was monitored and there was minimal postoperative aqueous flare with no ocular discomfort. Diode laser is an effective treatment of highly pigmented iris cysts.

Key words: *cyst, deflation, laser, melanin, Retriever.*

INTRODUCTION

Uveal cysts are single or multiple fluid filled structures that arise from the iris or ciliary body epithelium (Gelatt, 2013). They usually appear as dark pigmented or translucent masses, brown or black coloured, rarely amelanotic or white coloured (Delgado, 2010). They are often visualised free-floating within the anterior chamber or still attached to the pupillary margin. (Gelatt, 2001; Townsend, 2008)

The uveal cysts can be congenital or acquired from a trauma or inflammation. They are over represented in the Golden Retriever, Labrador and Boston Terrier breeds (Breaux, 2005; Corcoran, 1993; Grahn, 1997; Sapienza, 2000; Townsend, 2013) but they have also been described in the English Setter (Peiffer, 1976), American Bulldog (Pumphrey, 2013), Yorkshire Terrier (Delgado, 2010), Great Dane (Spiess, 1998) and the Akbash dog breeds (Saroglu, 2004).

Uveal cysts are usually benign and no treatment is therefore required. However, complications can occur and these include vision impairment, corneal endothelial opacity, pigment dispersion onto the anterior lens capsule and cataract formation, glaucoma and blindness (Gelatt, 2013; Pumphrey et al., 2013; Wilkie, 2011).

Large highly pigmented cysts can interfere with vision or can block the aqueous humour outflow pathway. Secondary glaucoma and blindness has been documented (Deehr, 1998; Sapienza et al., 2000) with iris cysts development in the Golden Retriever (Esson, 2009) and with ciliary body cysts in the Great Dane and American Bulldog breeds (Spiess, 1998). Pathogenesis of glaucoma is associated with the presence of numerous cysts in the posterior chamber causing displacement of the iris and compression of the ciliary cleft or due to cysts entrapment in the iridocorneal angle (Gelatt, 2001).

More cysts can be present trapped between the iris and the posterior chamber, therefore mydriasis is an important step of the diagnosis. Additionally, free-floating cysts can be found ventrally in the anterior chamber.

Differential diagnosis includes iridal melanoma. Ultrasonography will confirm the fluid-filled content (Delgado et al., 2010; Gelatt, 2001) if diagnosis is questionable.

Different methods of treatment have been described including surgical aspiration and laser therapy.(Gelatt, 2001)

Laser (light amplification by the stimulated emission of radiation) has been sucessfully used in veterinary ophthalmology in corneal, episcleral, limbal and uveal surgery, and as a

treatment for glaucoma and retinal detachment. (Calin, 2011; Cook, 1999; Gemensky-Metzler, 2004; Gilmour, 2002; Spiess, 2012; Wilkie, 1997; Gilmour, 2002)

Laser therapy of anterior uveal cysts has been considered a non-invasive procedure (Gemensky-Metzler et al., 2004) compared to the surgical technique when the cyst is manually removed or punctured and suctioned with a hypodermic needle.

Diode and ND: YAG lasers are the most common lasers used to treat iris cysts and intraocular neoplasia. Their mechanism is based on photocoagulation or photodisruption of the cyst wall and once penetrated, the cyst is deflated.

Diode laser (DioVet) is the most used laser in veterinary ophthalmology mostly due to its high absorbtion by melanin targeting pigmented tissues, low cost and portability as well. (Spiess, 2012;Gilmour, 2002)

Laser energy absorbtion is dependent on the presence of melanin ocular pigment. Melanin absorbs visible and infrared wavelengths (400 to 1400 nm) and is highly concentrated in uveal tissues and retinal pigmented epithelium. (Spiess, 2012)

For iris cysts treatment, the power of DioVet is set to maximum 1200 mW when used with an operating microscope adapter and to 1500 mW when a laser indirect ophthalmoscope is used, with average duration ranges from 500 to 1500 ms. (Gilmour, 2002)

MATERIALS AND METHODS

A 6 year-old neutered male Flat Coated Retriever was referred to the Ophthalmology service at the Animal Medical Centre for evaluation of the presence of two pigmented intraocular masses (Figure 1).

A general physical examination and an ophthalmic evaluation using slit lamp biomicroscopy and indirect ophthalmoscope were performed.

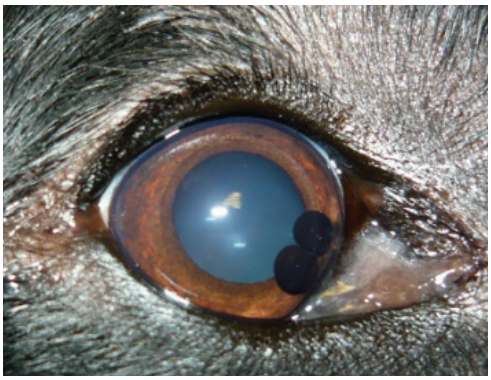

Figure 1. Clinical presentation of free-floating iris cysts in a Flat Coated Retriever, right eye

There was a copious grey discharge at the nasal canthus and two round-shaped dark pigmented masses in the anterior chamber free-floating close to the pupillary margin at 3 to 6 o'clock area were noted in the right eye (Figure 2). No corneal endothelial damage and no signs of uveitis were present.

Figure 2. Uveal cysts floating in the anterior chamber, very close to the corneal endothelium. Flat Coated Retriever, right eye

Direct ophthalmoscopy (Welch Allyn PanOptic) was unremarkable and induced mydriasis did not reveal any other cysts. Transillumination and slit lamp biomicroscopy examination confirmed these to be posterior iris cysts.

Options of treatment were discussed as the cysts were quite large in size, impeding visual axis and to avoid corneal endothelium damage.

A course of nonsteroidal eye drops (ketorolac trometamol 0.5%, Acular) four times a day and oral meloxicam were initiated prior to laser therapy.

Figure 3. Uveal cysts preoperatively, noted to have increased in size since last seen.
Flat Coated Retriever, right eye

A diode laser IRIS Medical was set up to the maximum power of 1500 mW, duration and interval of 100 ms (Figure 4) (IRIDEX, n.d.).

Figure 4. DioVet Laser, IRIS Medical and laser protection glasses that have to be worn by all members of the surgical and anaesthesia team

Under general anaesthesia, laser treatment was delivered to effect using an indirect head-mounted ophthalmoscope and a 20D lens (Figure 5).

Figure 5. Laser DioVet was used with an indirect head-mounted ophthalmoscope and a 20D lens

Preoperatively, atropine and proxymethacaine eye drops were applied to reduce secondary uveitis changes and to allow manipulation of the eyeglobe, respectively. A pair of mosquito forceps was used to grab the conjunctiva and position the globe centrally.
The most heavily pigmented portion of the cyst was targeted trying to avoid the area of the cyst in contact with the corneal endothelium (Figure 6).

Figure 6. Aiming laser red light DioVet laser (IRIS Medical). The focused red dot is on the cyst.
Flat Coated Retriever, right eye

The laser was fired at and focused on the cysts until significantly shrunken and ruptured releasing the content in the anterior chamber (Figure 7).

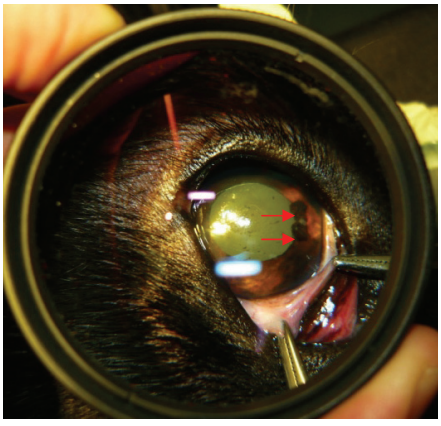

Figure 7. Collapsed, ruptured cysts against the pupillary margin at 3 o'clock site, viewed through a 20 D lens.
Flat Coated Retriever, right eye

RESULTS AND DISCUSSIONS

The uveal cysts in this case had a typical appearance and did not require ultrasonography

to confirm diagnosis. Laser therapy was considered as they were interfering with the visual axis.

Laser energy can be delivered to the ocular tissues using transscleral probes in a contact or noncontact mode, endoprobes, the laser indirect ophthalmoscope for transcorneal and transpupillary transmission, the slit lamp biomicroscope and an operating microscope adapter (Spiess, 2012). An indirect ophthalmoscope and a 20 D lens were used to aim the laser light on the cysts in this case.

If well pigmented, the surface shrinks and ruptures releasing the content in the anterior chamber. Once ruptured, more laser energy can be used on the cyst to ensure it collapses completely, although care needs to be taken to avoid endothelial damage due to hyperthermia. Laser absorption is poor if the cysts have thin walls or are poorly pigmented. Attempts to create multiple holes in different areas of the cyst until finally ruptures can also be made. (IRIDEX, n.d.)

In this case, both iris cysts walls were successfully and easily ruptured due to their high content of pigment. After deflation, a "smoke-like" appearance in the anterior chamber due to hyperthermia was noted and melanin pigment was seen dispersing on the surface of the anterior lens capsule (Figure 8 and Figure 9). Occasionally remnants of cysts may remain attached to corneal endothelium or to the pupillary margin as in this case. (Gelatt, 2001)

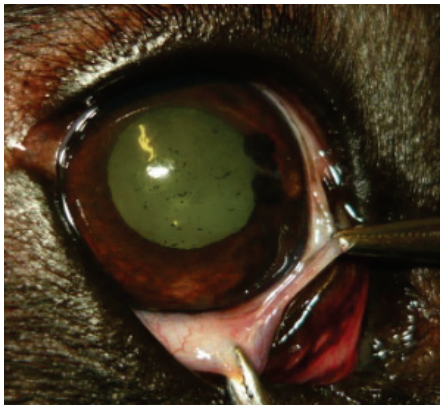

Figure 8. Incompletely collapsed iris cysts and pigment dispersion onto the surface of the anterior lens capsule. Flat Coated Retriever, right eye

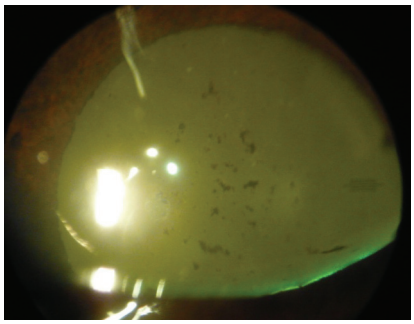

Figure 9. Viewed through the slit lamp biomicroscope, there is pigment dispersion on the surface of the anterior lens capsule. Flat Coated Retriever, right eye.

Aqueous flare was noted but no corneal oedema as a result to hyperthermia was present. Aqueous flare or discomfort is usually not seen postoperatively (Gemensky-Metzler et al., 2004). However, postoperative steroidal and/or nonsteroidals and mydriatic eye drops are usually required to prevent or manage secondary uveitis (Gelatt, 2013).

Alternatively to laser treatment, paracentesis with deflation and aspiration of the cyst wall and content can be attempted (Delgado et al., 2010; Gelatt, 2001; Gelatt, 2013) with regard to the postoperative uveitis.

In this case, recovery was uneventful and mild signs of uveitis were noted three days later and an injection of steroids (dexamethasone sodium phosphate, 2mg/ml, 0.1 mg/kg) was administered and topical steroids and antibiotics (dexamethasone, polymyxin, and neomycin, Maxitrol eye drops) were added to treatment.

Monthly follow up to 6 months revealed no signs of uveitis and no recurrence or other uveal cysts to have appeared (Figure 10 and Figure 11).

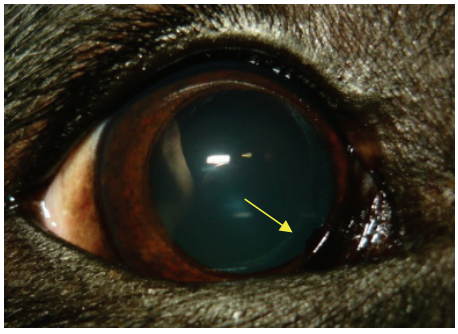

Figure 10. A month postoperative examination showed no signs of uveitis or discomfort. The yellow arrow indicates the presence of a cyst remains attached to the pupillary margin at the 4 o'clock site. Flat Coated Retriever

Figure 11. Six month-follow up, the eye is cyst-free with no signs of discomfort. Flat Coated Retriever, right eye.

CONCLUSIONS

A clinical case of uveal cysts in a Flat Coated retriever breed and successful laser treatment are being described.

Highly pigmented cysts are suitable for laser deflation with DioVet laser. During the procedure care must be taken not to damage the corneal endothelium due to hyperthermia.

Complications associated with this technique only included melanin pigment dispersion and mild signs of uveitis that resolved with topical and systemic anti-inflammatory.

Iris cyst laser deflation is rendered a safe and effective treatment with minimum damage of the intraocular tissues.

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