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CASE REPORT

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Surgical excision of iridociliary tumors using a postero-anterior cyclo-iridectomy and thermocautery in two dogs

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Abstract

Objective: To report the surgical excision of an iridociliary adenoma and iridal melanocytoma using a postero-anterior cyclo-iridectomy in two dogs.

Procedure: A 7 year old neutered male English springer spaniel (case 1) and a 7 year old neutered male Labrador mix (case 2) were presented for evaluation of an intrairidal mass OS.

Results: Complete ophthalmic examination revealed a large, dorsonasal, well-demarcated, intrairidal mass OS. A tan to pink intrairidal mass extending into the iridocorneal angle (case 1) and a pigmented intrairidal mass (case 2) were present. B-mode ultrasonography showed a focal, soft tissue, homogenous mass within the uvea adjacent to and contacting the lens. Neither pars plana involvement nor vitreal extension was present. A postero-anterior cyclo-iridectomy was performed through a polyhedral scleral flap. Thermocautery was used to complete the cyclo-iridectomy (case 1) and partial iridectomy (case 2) to excise the mass en bloc. Histopathology revealed a completely excised iridociliary adenoma (case 1) and iris melanocytoma (case 2). The surgery sites healed without complication. Mild uveitis (cases 1 and 2), scant vitreal hemorrhage (case 1), and mild hyphema (case 2) were present three days postoperatively but had resolved ten days postoperatively. The patients remain visual twenty-two months (case 1) and seven months (case 2) postoperatively with a normal intraocular examination other than an iridal defect and mild dorsonasal lens capsular opacities.

Conclusions: The surgical approach described in these cases is utilized in physician-based medicine. This approach and the use of thermocautery provide a viable surgical option for excision of large iridociliary tumors in dogs.

KEYWORDS

canine, cyclo-iridectomy, intraocular tumor, iridociliary, iridociliary adenoma, melanocytoma, ocular tumor, thermocautery, uveal tumor

1 | INTRODUCTION

Primary intraocular tumors are sporadically reported in dogs, with iridal melanomas, iridal melanocytomas, and ciliary body epithelial tumors being the most common.[1-5] Other less commonly reported primary intraocular tumors include neuroectodermal tumors,[6] lymphoma as a primary ocular manifestation,[7] myxoid leiomyoma,[8] and osteosarcoma.[9] Both intraocular melanocytic and iridociliary tumors have a very low metastatic rate, estimated to be

0%-4%.[2,5] Melanocytic tumors are categorized as either melanomas, which have higher mitotic indices and more aggressive behavior, or as melanocytomas, which have more benign behavior and lower mitotic indices.[10] One study found a statistical difference in survival times of dogs with intraocular melanomas versus melanocytomas, indicating that more aggressive tumors with higher mitotic indices may be more likely to metastasize or recur locally.[11] Primary ciliary body epithelial tumors may be characterized as either adenomas or adenocarcinomas with classification dependent, for the most part, on extent and nature of local tissue invasion.[2] Conclusive metastasis of iridociliary tumors in dogs has not been reported.

Published reports of canine iridociliary tumors are infrequent in the literature, despite being the second most common primary intraocular tumors in dogs. The histopathologic studies collectively suggest a poor overall prognosis for maintenance of the globe and vision with canine iridociliary tumors,[12-14] and scleral invasion has been associated with a high recurrence rate. Treatment of adenocarcinomas using a combination of globe-sparing surgical excision and chemotherapy has been reported with good success rates, but detailed surgical descriptions are lacking.[15] Excisional and incisional biopsies have been reported, although no surgical descriptions of these procedures exist and one study concluded "…complete excision is rarely achieved and recurrence is common."[12] Thus, enucleation has historically been the treatment of choice for canine iridociliary tumors.

Intraocular primary iridociliary and melanocytic tumors in humans are also uncommonly reported in the literature and have similar biologic behavior and histopathologic characteristics to canine iridociliary and melanocytic tumors.[16] In contrast to the veterinary literature, surgical excision of human iridociliary and melanocytic tumors with preservation of the globe is the preferred treatment. Surgical excision has a high success rate and ancillary therapy is often utilized, especially if the tumor is incompletely excised.[16-21] The two main surgical techniques described for tumor excision are either an antero-posterior approach or postero-anterior approach, with the technique choice dependent on tumor location.[17] The antero-posteroir approach is utilized for anterior or iris tumors and involves an iridectomy or iridocyclectomy originating at the pupillary margin versus iris base. The postero-anterior approach is typically utilized for cilary body tumors or iridociliary tumors and involves a cyclectomy or cyclo-iridectomy originating at the iris base or ciliary body.[17] Both preoperative mydriasis and miosis have been described with choice somewhat dependent on surgeon preference and experience.[20,22,23] It has been suggested that preoperative miosis be utilized for tumors at the iris base to avoid excessive iridal tissue excision, especially toward the pupillary margin, primarily because humans experience photophobia and other visual disturbances with large iridectomies.[22] Preoperative mydriasis has been suggested for large iridociliary tumors to facilitate complete excision.[20,23] Enucleation is reserved in human cases for which surgery is not possible or uncontrolled glaucoma is present.

This report describes the surgical excision of two large canine iridal and iridociliary tumors using a postero-anterior cyclo-iridectomy with preoperative mydriasis and thermocautery in two dogs. This surgical description of iridociliary tumor excision in dogs is a technique utilized in physician-based medicine and represents a surgical option in veterinary ophthalmology.

2 | CASE REPORT

2.1 | History and ophthalmic examination case 1

A seven-year-old neutered male English springer spaniel presented to Animal Eye Clinic (Westfield, IN) for evaluation of a tan intraocular mass OS. The mass had been noted the morning of presentation by the owners, which prompted them to visit the referring veterinarian. The veterinarian referred the patient after noting an intraocular mass OS and otherwise normal systemic evaluation. The patient had undergone a full physical examination at the referring veterinarian's office six weeks prior to presentation, at which time, no visible ocular abnormalities were noted, although a full ophthalmic examination was not performed by a board-certified ophthalmologist.

Upon presentation, a complete ophthalmic examination was performed using slit-lamp biomicroscopy and indirect ophthalmoscopy. A large, well-demarcated, tan to pink, raised intrairidal mass was noted OS in the dorsonasal quadrant affecting the entire iris width over approximately three clock hours measuring approximately 6 x 6 mm (Figure 1A). Mild dyscoria was noted, which was markedly pronounced after pharmacologic mydriasis (Figure 1B). Iridal movement was absent in the location of the mass but was present in unaffected areas. Based on the ophthalmic examination, a presumptive diagnosis of a primary iridociliary tumor was made. The remainder of ophthalmic examination was normal OU, including fundic examination posterior to the location of the mass as facilitated with pharmacologic mydriasis. Both globes had normal position and motility. The Schirmer tear test values (Schirmer tear test, Merck and Company, Inc) and intraocular pressures as measured with applanation tonometry (Tonopen Avia, Reichert Technologies) were both normal OU. There was no conjunctival or corneal fluorescein stain retention OU. The patient was visual OU as determined by menace response, tracking, and normal maze navigation with contralateral eye coverage.

Gonioscopy revealed extension of the mass to the iris base and iridocorneal angle focally and was otherwise normal.

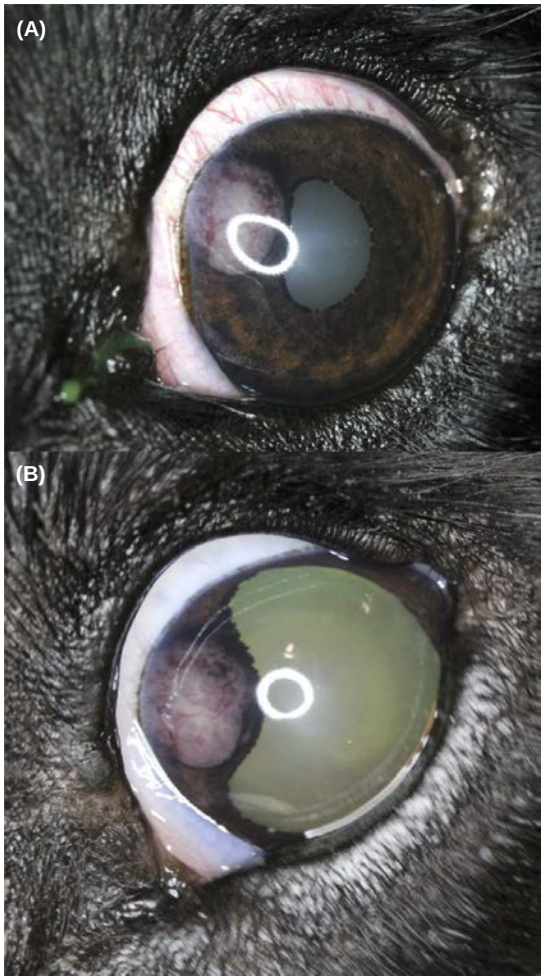

FIGURE 1 The left eye is depicted from case 1 at the time of initial presentation prior to (A) and post-(B) pharmacologic mydriasis. A large, well-demarcated, tan to pink, raised intrairidal mass is present in the dorsonasal quadrant affecting the entire iris width over approximately three clock hours. Secondary dyscoria was pronounced after pharmacologic mydriasis (B)

Ocular ultrasound (10 mHz, Aviso, Quantel Medical) imaging showed a well-demarcated, large, soft tissue, homogenous mass focally expanding the iris and ciliary body (Figure 2). The mass was adjacent to and contacting the lens focally; however, no extension was noted posterior to the lens equator, as was confirmed with indirect ophthalmoscopy. Systemic diagnostics including a complete blood count, comprehensive chemistry, urinalysis, and thyroxine were unremarkable. Based on the presumptive diagnosis and lack of any reported metastasis of these tumors, systemic imaging was not recommended.

2.2 | History and ophthalmic examination case 2

An approximately seven-year-old neutered male Labrador mix presented to Animal Eye Clinic (Westfield, IN) for evaluation of a pigmented intraocular mass OS. The mass had been noted three weeks prior to evaluation and was reportedly noted to be growing during that time. The patient had undergone a full physical examination at the referring veterinarian's office three weeks prior to presentation, at which time, the mass was noted and referral was recommended.

Upon presentation, a complete ophthalmic examination was performed using slit-lamp biomicroscopy and indirect ophthalmoscopy. A well-demarcated, pigmented, raised, intrairidal mass was noted OS in the dorsonasal quadrant involving approximately one and a half clock hours measuring approximately 3 x 3 mm and affecting 70% of the iris width (Figure 3). Slight dyscoria was noted, which was more prominent during iridal movement and mydriasis. Iridal movement was decreased in the location of the mass, but was present

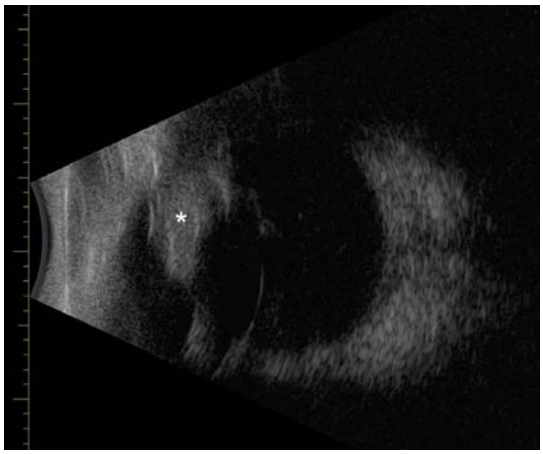

FIGURE 2 A representative ultrasonographic image of the left globe (case 1) is shown. A well-demarcated, soft tissue density, homogenous mass is present focally expanding the iris and ciliary body. The mass is contacting the lens focally, but no extension into the lens or posterior to the lens is noted

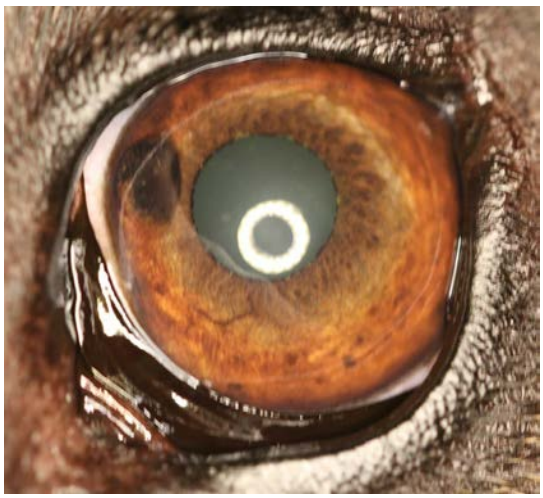

FIGURE 3 The left eye is depicted from case 2 at the time of initial presentation. A well-demarcated, pigmented, raised, intrairidal mass was present in the dorsonasal quadrant over one and a half clock hours

in unaffected areas. Based on the ophthalmic examination, a presumptive diagnosis of a primary iris melanoma was made. The remainder of ophthalmic examination was normal OU, including fundic examination posterior to the location of the mass as facilitated with pharmacologic mydriasis. Both globes had normal position and motility. The Schirmer tear test values (Schirmer tear test, Merck and Company, Inc) and intraocular pressures as measured with applanation tonometry (Tonopen Avia, Reichert Technologies) were both normal OU. There was no conjunctival or corneal fluorescein stain retention OU. The patient was visual OU as determined by menace response, tracking, and normal maze navigation with contralateral eye coverage.

The mass was well demarcated in the iris, and the iris base was visible and unaffected. Thus, gonioscopy was not performed. Ocular ultrasound (10 mHz, Aviso, Quantel Medical) imaging showed a well-demarcated, soft tissue, homogenous, anechoic mass focally expanding the iris (Figure 4). The mass was adjacent to and contacting the lens focally; however, no extension was noted posterior to the lens equator, as was confirmed with indirect ophthalmoscopy. Systemic diagnostics including a complete blood count, comprehensive chemistry, urinalysis, and thyroxine were unremarkable. Based on the presumptive diagnosis and very low rate of metastasis of these tumors, systemic imaging was not recommended.

2.3 | Surgical description

Due to the owners' desire to preserve the globe and vision in both cases along with the high surgical success rate in human literature for similar tumors, a postero-anterior cyclo-iridectomy (case 1) and iridectomy (case 2) were planned to excise the tumors. Preoperative mydriasis was utilized in both cases as the masses were large involving the complete iris width (case 1) and almost the complete iris width (case 2) in the affected area, and preservation of iris tissue peripheral to the mass was not deemed possible. In addition, the postero-anterior approach allows for the use of thermocautery, which was considered desirable to aid with control of intraocular hemorrhage and possibly help prevent recurrence.

Both patients were routinely premedicated and placed under general anesthesia. The left eye was prepared for aseptic ophthalmic surgery and the patients were positioned in dorsal recumbency with appropriate head position to facilitate OS microscopic surgery, as has been previously described.[24] Intraoperative neuromuscular paralysis was utilized with appropriate anesthesia monitoring and time-cycled, volume constant, pressure limited mechanical ventilation for the duration of the procedure.

Two limbal-based partial-thickness stay sutures were placed with 5-0 Vicryl on either side of the mass approximately 5 mm from the nasal and dorsal mass margins, respectively. The globe was rotated ventrotemporally to facilitate visualization and exposure of the mass. An arc-shaped conjunctival incision was made using Steven's tenotomy scissors to expose the sclera adjacent to the mass. The conjunctiva and associated Tenon's capsule were undermined and reflected at the limbus overlying the cornea (Figure 5). A polyhedral limbal-based approximately 90% thickness scleral flap was created using a 64 beaver blade and reflected toward the cornea to expose the sclera immediately overlying the mass (Figure 5). The sclera was then incised at the limbus through the remaining thickness to enter the anterior chamber using a 64 blade. The anterior chamber was maintained using a viscoelastic surgical device (I-Visc-Vet), and the sclera overlying the mass was incised to include the polyhedral and limbal portion using Westcott

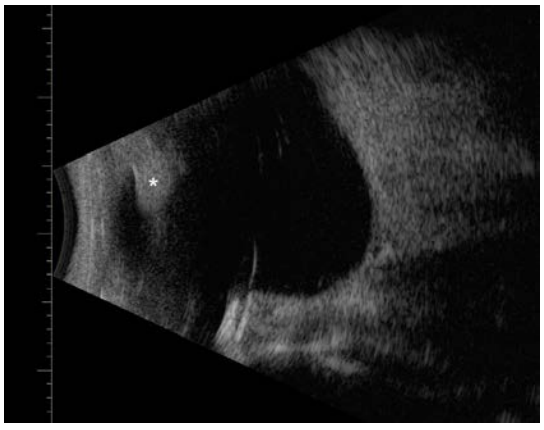

FIGURE 4 A representative ultrasonographic image of the left globe (case 2) is shown. A well-demarcated, soft tissue density, homogenous mass is present focally expanding the iris. The mass is contacting the lens focally, but no extension into the lens or posterior to the lens is noted

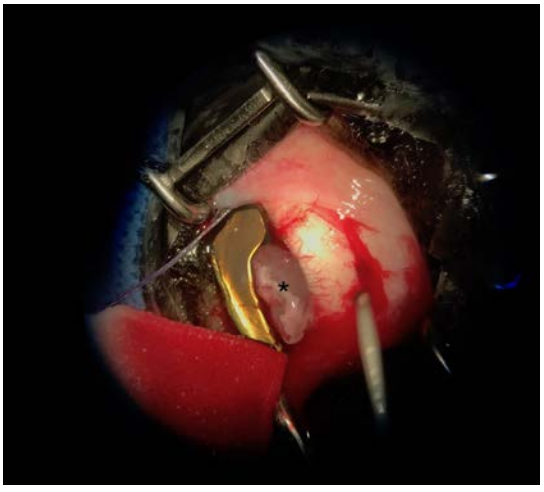

FIGURE 5 An intraoperative representative photographs (case 1) depicting a postero-anterior cyclo-iridectomy with the left globe rotated ventrotemporally using 5-0 Vicryl limbal-based stay sutures is shown. The conjunctiva (asterisk) overlying the mass was incised and reflected at the limbus overlying the cornea (arrow)

tenotomy scissors. Viscoelastic was used to maintain the anterior chamber and progressively elevate the mass from the eye. The deep scleral flap was grasped with Colibri forceps and used to manipulate the mass without grasping or contacting the mass (Figure 6). Handheld thermocautery was then used to perform a cyclo-iridectomy (case 1) and iridectomy (case 2) peripheral to the mass with approximately 2 mm margins peripheral to the mass. The mass was fully excised and elevated using viscoelastic and gentle traction on the associated deep scleral flap (Figure 7). The mass was submitted for histopathology in both cases.

In case 1, a single layer of biosynthetic cornea (A-cell, Inc) was sutured over the deep scleral defect using two stay sutures of 8-0 Vicryl. In case 2, A-cell was not utilized. The scleral flap was closed using simple interrupted 8-0 Vicryl sutures (Figure 8). The conjunctival flap was closed using 8-0 Vicryl simple continuous sutures (Figure 9). The patients were routinely recovered from anesthesia and discharged later the same day with the following medications and instructions: topical non-steroidal anti-inflammatory medication (ketorolac or diclofenac) OS BID-TID, topical neomycin-polymyxin-dexamethasone OS BID-TID, topical atropine OS SID for 10 days, melatonin 0.3 mg/kg BID PO for one month, prednisone 0.5-1 mg/kg PO per day tapered over 14 days, and tramadol 2-4 mg/kg BID PO for 3 days. Topical steroidal anti-inflammatory therapy was discontinued after two months, and topical non-steroidal anti-inflammatory therapy was discontinued after four months. No recurrence of uveitis was noted during the follow-up period.

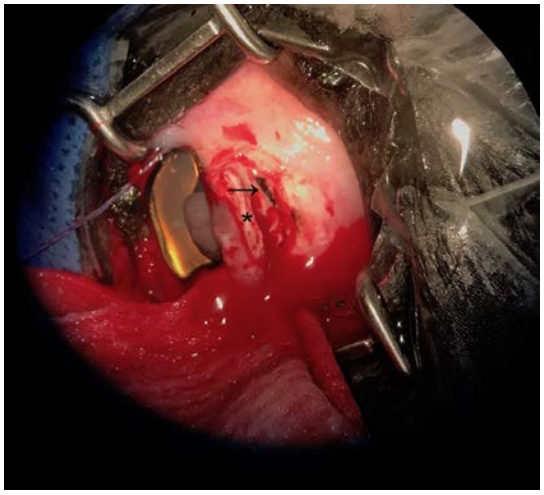

FIGURE 6 An intraoperative representative photographs (case 1) depicting a postero-anterior cyclo-iridectomy with the left globe rotated ventrotemporally using 5-0 Vicryl limbal-based stay sutures is shown. A polyhedral limbal-based 90% thickness scleral flap was created using a 64 beaver blade. The scleral flap is shown (asterisk), and the adjacent sclera overlying the mass (arrow) was used to manipulate the mass and was excised with the mass. The adjacent sclera was incised, and handheld thermocautery was used to incise the uveal tissue peripheral to the mass. The mass was elevated from the eye using a viscoelastic surgical device and gentle scleral traction

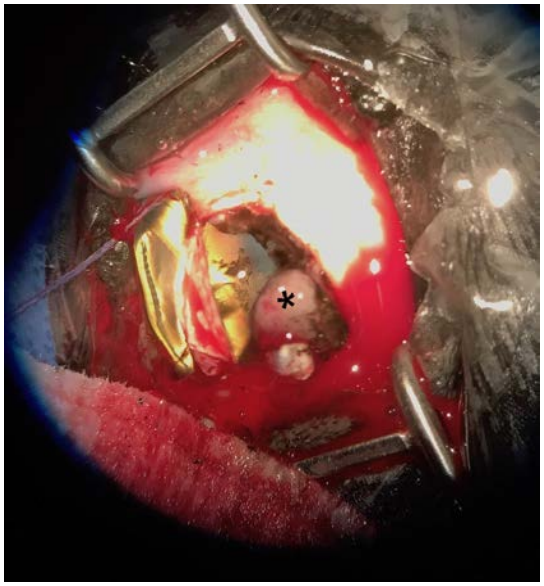

FIGURE 7 An intraoperative representative photographs (case 1) depicting a postero-anterior cyclo-iridectomy with the left globe rotated ventrotemporally using 5-0 Vicryl limbal-based stay sutures is shown. The mass is depicted (asterisk) partially elevated from the scleral defect with overlying sclera reflected rostrally

2.4 | Histopathology case 1

A densely cellular and haphazardly arranged mass was present dissecting between uveal stroma (Figure 10). The cells were arranged in sheets, fascicles and cords with interspersed glassy eosinophilic material interpreted to be basement membrane. The cells were polygonal and spindle with a few cells possessing vacuolar cytoplasm. Anisocytosis and anisokaryosis were mild with 4 mitotic figures per 10 hpf. Small margins of unaffected uvea were present on two sides with cauterized edges while unaffected sclera was present on the superficial margin. Margin evaluation was somewhat difficult due to the nature of the tissue, but complete excision was deemed likely. The mass was diagnosed as an iridociliary adenoma.

2.5 | Histopathology case 2

A nodular, heavily pigmented mass was present within the iris composed of plump, heavily pigmented, polygonal to stellate cells (Figure 11). The cells contained abundant cytoplasm and distinct cell borders with round nuclei containing coarse chromatin and a single, central nucleoli. Anisocytosis was moderate, and anisokaryosis was mild. No mitotic figures were observed. The pupil margin and iris base were unaffected with two peripheral 1 mm unaffected cauterized iris

margins. The mass was completely excised and diagnosed as an iridal melanocytoma.

2.6 | Clinical outcome and results

The clinical outcome and results were essentially identical for both cases. Immediately postoperatively, the left eye in both cases was comfortable and visual with pharmacologic mydriasis. Three (case 1) and four (case 2) days postoperatively, mild anterior uveitis was present with trace flare. Pharmacologic mydriasis in both cases was present and the patient was comfortable and visual (Figure 12A,B). Scant vitreal hemorrhage (case 1) and scant hyphema with admixed fibrin (case 2) were present. Both the scant hemorrhages and uveitis resolved by day ten postoperatively. A large iridal defect was present with mild pigment deposition along the anterior lens capsule in the area of the defect. After pharmacologic mydriatic therapy was discontinued at day ten postoperatively, iridal movement was present in the remaining iris with predictable resultant dyscoria. Incipient capsular and subcapsular opacities were noted and did not progress over the follow-up period (twenty-two months and seven months) (Figure 13A,B). Normal vision was present OS. Case 1 did not have any reports of photophobia, even in bright sunlight. Mild photophobia was reported in case 2 with bright sunlight exposure, but was not reported when the patient was indoors or outdoors during overcast days.

3 | DISCUSSION

The surgical approach described is routinely utilized in physician-based medicine for excision of iridal and iridociliary tumors. This has, to the authors' knowledge, not been reported in the veterinary literature, but species and tumor similarities would suggest that this surgery would not only be applicable, but would also carry a high success rate for tumor control and cure. In the case reports described, both tumors were completely excised and recurrence was not present during the follow-up periods of twenty-two and seven months. Ancillary therapy was thus not necessary, but presumptively could also be extrapolated from human literature, as well, had the tumors not been completely excised.

This surgical method utilized thermocautery for the iridectomy, a modification that was employed for two reasons. In our case, cautery was used to perform the iridectomy versus iridal scissors to help minimize intraoperative hemorrhage. This technique also causes mild collateral tissue damage that was desirable as narrow surgical margins were obtained to avoid a larger-than-necessary iridectomy. Scleral cautery was not utilized during the scleral approach, although significant scleral hemorrhage was encountered. A precise sclerotomy was desired as the deep sclera was retained with the mass and the scleral incision was polyhedral which has been shown to provide more accurate wound apposition in a globe. Cautery is less precise than a scalpel blade due to collateral tissue damage and larger cutting surface. Additionally, in the authors' experience, handheld cautery is poorly effective at

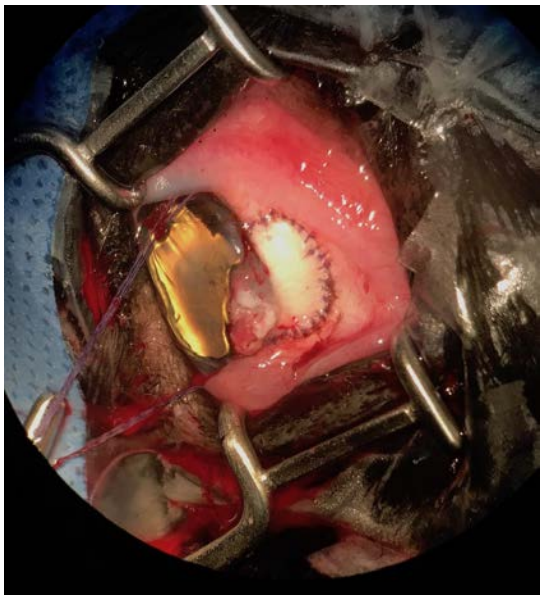

FIGURE 8 An intraoperative representative photographs (case 1) depicting a postero-anterior cyclo-iridectomy with the left globe rotated ventrotemporally using 5-0 Vicryl limbal-based stay sutures is shown. The scleral defect was closed using 8-0 Vicryl simple interrupted sutures, and the conjunctiva was closed with 8-0 Vicryl in a simple continuous pattern

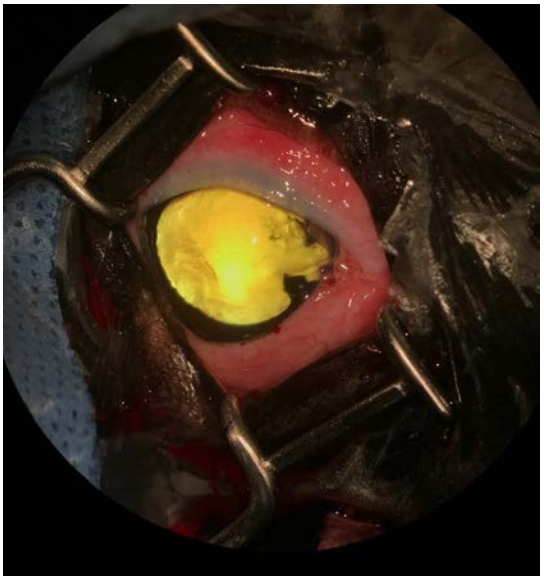

FIGURE 9 An intraoperative representative photographs (case 1) depicting a postero-anterior cyclo-iridectomy is shown. The left globe was formed with no intraocular hemorrhage present at the completion of surgery. Corneal distortion was not present and perceived irregularities in the corneal surface in the photograph are due to pigment exfoliation and remaining viscoelastic surgical material

control of scleral hemorrhage. During the scleral approach, the hemorrhage was wicked away and controlled using cold saline lavage.

Excision of the deep sclera adjacent to the tumor along with the tumor is described in the human literature and was employed in this procedure.[17] A previous report of canine iridal and iridociliary biopsies, even reportedly excisional biopsies, showed a high rate of local recurrence, especially in the adjacent sclera.[12] Thus, excision of this tissue was predicted to help decrease or eliminate local recurrence. This may not only help prevent local recurrence, but also allows for more precise tumor removal by providing a robust fibrous tissue attached to the tumor for surgical manipulation. As these tumors are typically friable, accurate removal would be theoretically optimized by decreased surgical manipulation and less tumor cell exfoliation. In our cases, the tumor was located in the dorsonasal quadrant. This location is readily accessible via a postero-anterior approach and allows for a deep sclerectomy. Positioning may be more difficult or not possible if this technique was utilized for ventronasal or ventrotemporal tumors.

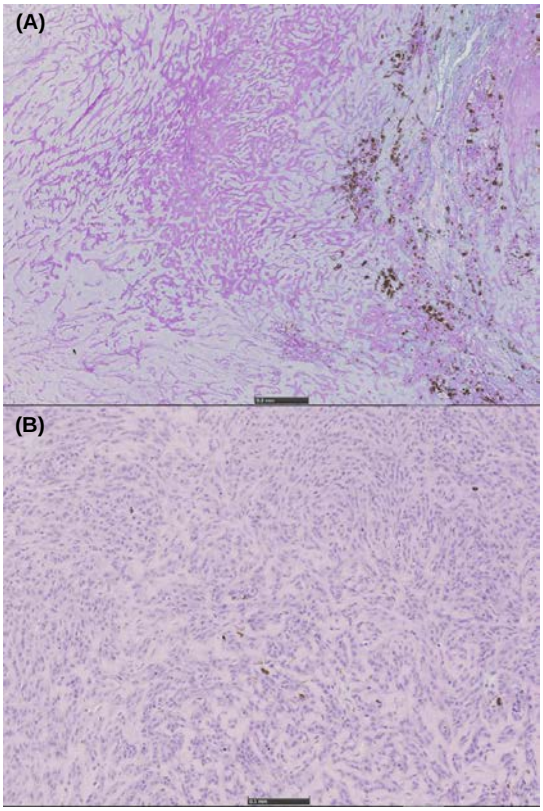

FIGURE 10 A photomicrograph (4x magnification) of an iridociliary adenoma (case 1) is depicted (A). Periodic acid-Schiff-positive basement membranes (magenta) surrounding clusters of pale-stained cells (light blue) are present. Alcian blue-PAS stain. A photomicrograph (10x magnification) of an iridociliary tumor (case 1) is depicted (B). The mass contains nests and cords of fusiform cells with faint pigment (brown granules) and band of glassy, eosinophilic material (basement membrane). Hematoxylin and eosin stain

Preoperative mydriasis was utilized in both cases to improve intraoperative and postoperative cycloplegia and help facilitate excision of the tumor. Cycloplegia was desired because a large iridectomy was performed in both cases and significant postoperative uveitis was predicted. In addition, the entire iris section was excised because preservation of any adjacent iridal tissue along the width of the iris was not deemed possible due to the tumor size. Postoperative pharmacologic mydriasis was utilized for ten days postoperatively until the uveitis had resolved. It is unknown whether this played a significant role in prevention or resolution of postoperative uveitis, although the authors' purport that it likely did.

In addition to pre- and postoperative mydriasis, anti-inflammatory therapy, both topically and orally, was deemed important as significant uveitis was anticipated. In addition to traditional anti-inflammatory therapy, oral melatonin was utilized as this has been shown in one study to be effective at reducing uveitis post-phacoemulsification.[25] Because the surgery described herein is also an intraocular procedure and melatonin is considered to be safe, this medication was added. Uveitis resolved by day ten postoperatively, and anti-inflammatory therapy was tapered over time. More postoperative uveitis and fibrin in the short term as well as pigment exfoliation and capsular opacification in the long term were present in case 1 than case 2. The cyclo-iridectomy (case 1)

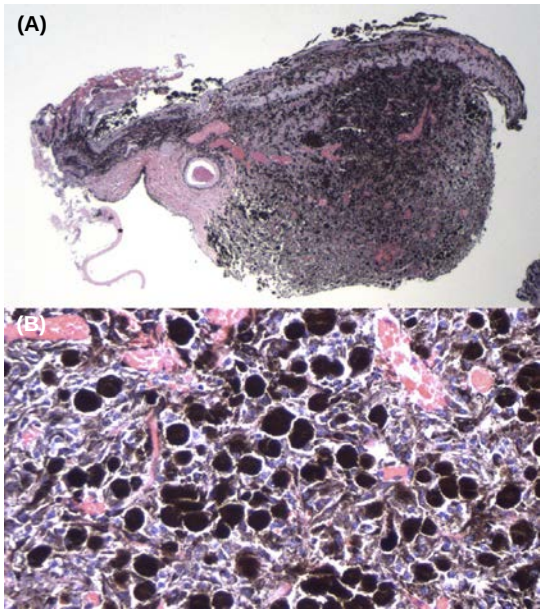

FIGURE 11 A photomicrograph (2x magnification) of an iridal melanocytoma (case 2) is depicted (A). The mass is nodular and heavily pigmented, distorting and expanding the anterior iris. The iris base and Descemet's membrane (asterisk) are unaffected. Hematoxylin and eosin stain. A photomicrograph (20x magnification) of an iridal melanocytoma (case 2) is depicted (B). The cells are heavily pigmented, with uniform nuclei, single nucleoli, and no mitotic figures, Hematoxylin and eosin stain

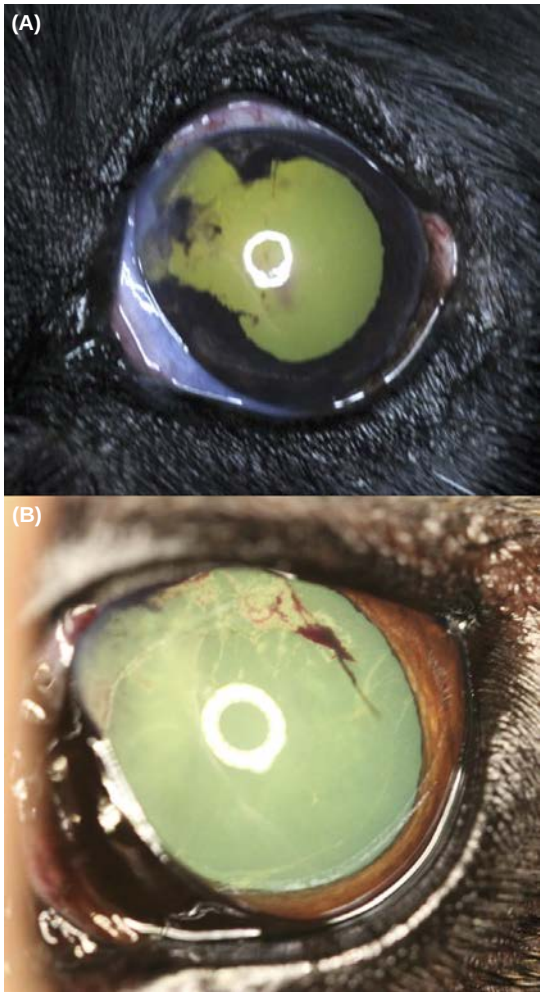

FIGURE 12 The left eye is depicted three days (case 1, A) and four days (case 2, B) postoperatively. The eye in each case is open and comfortable with mild anterior uveitis, pharmacologic mydriasis, pigment exfoliation, mild fibrin, and a large iris defect (A, B) with scant (A) to mild (B) hyphema. Focal scleritis at the sclerotomy site and diffuse conjunctivitis are present

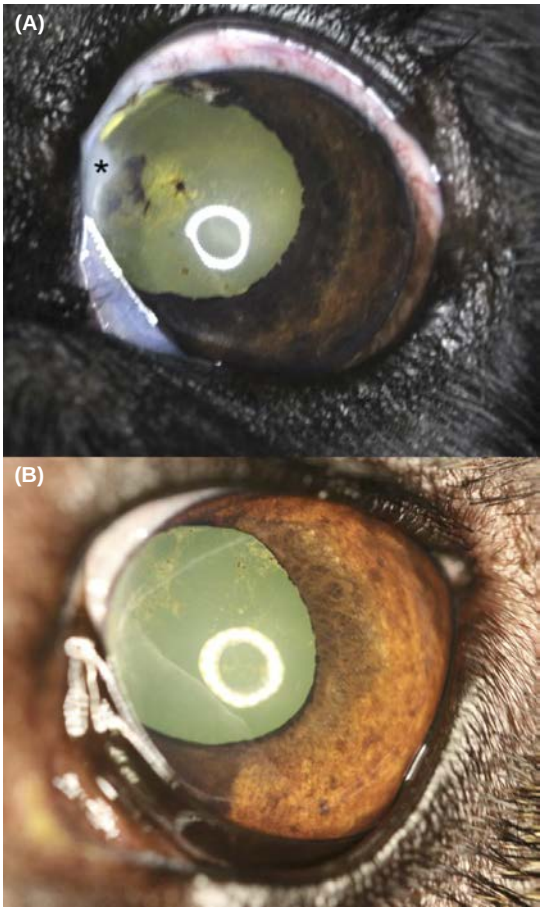

FIGURE 13 The left eye is depicted six months (case 1, A) and two months (case 2, B) postoperatively. The remaining iridal tissue is constricting and appears normal. A large iris defect is present with residual multifocal incipient capsular opacities. A small section of A-cell contacting the endothelium is visible at the limbus (arrow) in case 1 (A). The patients were comfortable and visual with no inflammation or other abnormalities noted on ophthalmic examination

resulted in more tissue excision and included part of the ciliary body. Thus, it is reasonable to surmise that a larger iridectomy or cyclo-iridectomy will cause more inflammation than a smaller surgery. Anti-inflammatory therapy, therefore, could be adjusted based on the amount of tissue disrupted as well as patient response.

A-cell, a porcine bladder matrix utilized in canine corneal transplantation, was used in the deep scleral defect in case 1.[26] This material migrated at the limbus and was visible along the endothelium at the limbus postoperatively despite two stay sutures (Figure 13). Based on this complication and the perceived robustness of the scleral flap, A-cell was not placed in the scleral defect in case 2. Both sclerotomy sites healed without complication or staphyloma formation. Based on this, A-cell or additional tectonic support is likely not necessary with this technique. In our case, the material remained inert with no evidence of corneal decompensation, fibrin, or uveitis secondary to contact with the aqueous during the follow-up period of twenty-two months (Figure 13).

Treatment of melanocytic tumors using a diode laser has been reported in the literature.[27] This technique has been shown to be effective at local melanocytic tumor control with a single treatment in 78% of cases while 22% of cases required more than one treatment. This technique would not be expected to be effective for tumors other than pigmented tumors due to the preferential absorption of diode laser's 810 nm wavelength by pigmented cells. This technique was thus not offered for case 1. Laser therapy was discussed for treatment of case 2; however, the clients lived 2.5 hours from the clinic and the need for ongoing monitoring after laser therapy and possible multiple treatments deterred the clients from this option. In addition, the mass was perceived to be growing quickly and the clients were inclined to pursue surgical removal.

In conclusion, a postero-anterior cyclo-iridectomy using thermocautery and preoperative mydriasis represents a viable surgical option for excision of large iridociliary or iridal tumors in dogs. Normal functional vision was achieved with preservation of the globe. In our cases, complete excision was achieved with no recurrence reported during the follow-up period.

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REFERENCES

1. Bussanich NM, Dolman PJ, Rootman J, et al. Canine uveal melanomas. Series and literature review. *J Am Anim Hosp Assoc*. 1987;23:415-422.
2. Dubielzig RR, Steinberg H, Garvin H, et al. Iridociliary epithelial tumors in 100 dogs and 17 cats: a morphological study. *Vet Ophthalmol*. 1998;1:223-231.
3. Bellhorn RW, Henkind P. Adenocarcinoma of the ciliary body. A report of 2 cases in dogs. *Pathol Vet*. 1968;5(2):122-126.
4. Peiffer RL, Gwin RM, Gelatt KN, et al. Ciliary body epithelial tumors in four dogs. *J Am Vet Med Assoc*. 1978;72(5):578-583.
5. Wilcock B, Peiffer RL. Morphology and behavior of primary ocular melanomas in 91 dogs. *Vet Pathol*. 1986;23:418±424.
6. Regan DP, Dubielzig RR, Zeiss CJ, et al. Primary primitive neuroectodermal tumors of the retina and ciliary body in dogs. *Vet Ophthalmol*. 2013;16(Suppl 1):87-93.
7. Ota-Kuroki J, Ragsdale JM, Bawa B, et al. Intraocular and periocular lymphoma in dogs and cats: a retrospective review of 21 cases (2001–2012). *Vet Ophthalmol*. 2014;6:389-396.
8. Billson FM, Mould JR, Lee WR. Myxoid leiomyoma of the iris in a dog. *Vet Ophthalmol*. 2003;2:173-176.
9. Heath S, Rankin AJ, Dubielzig RR. Primary ocular osteosarcoma in a dog. *Vet Ophthalmol*. 2003;1:85-87.
10. Friedman DS, Miller L, Dubielzig RR. Malignant canine anterior uveal melanoma. *Vet Pathol*. 1989;26:523-525.
11. Giuliano EA, Chappell R, Fischer B, et al. A matched observation study of canine survival with primary intraocular melanocytic neoplasia. *Vet Ophthalmol*. 1999;3:185-190.
12. Beckwith-Cohen B, Bentley E, Dubielzig RR. Outcome of iridociliary epithelial tumor biopsies in dogs: a retrospective study. *Vet Rec*. 2015;176(6):147.
13. Clerc B. Surgery and chemotherapy for the treatment of adenocarcinoma of the iris and ciliary body in five dogs. *Vet Comp Ophthalmol*. 1995;6:265-270.
14. Hendrix DV, Donnell RL. Lenticular invasion by a ciliary body adenocarcinoma in a dog. *Vet Pathol*. 2007;44:540-542.
15. Glickstein JM, Allen HL. Malignant ciliary body adenocarcinoma in a dog. *J Am Vet Med Assoc*. 1974;65:455-456.
16. Marigo FA, Finger PT. Anterior segment tumors: current concepts and innovations. *Surv Ophthalmol*. 2003;6:569-593.
17. Rospond-Kubiak I, Damato B. The surgical approach to the management of anterior uveal melanomas. *Eye (Lond)*. 2014;6:741-747.
18. Browkina AF, Gundorowa RA. Results and indications for surgery of iridociliary tumors. *Klin Monatsbl Augenheilkd*. 1980;6:933-937.
19. Char DH, Miller T, Crawford JB. Uveal tumor resection. *Br J Ophthalmol*. 2001;10:1213-1219.
20. Reese AB, Jones IS, Cooper WC. Surgery for tumors of the iris and ciliary body. *Am J Ophthalmol*. 1968;66(2):173-184.
21. Vail DT. Iridocyclectomy. A review. Gleanings from the literature. *Am J Ophthalmol*. 1971;71:161-168.
22. Damato BE. Local resection of uveal melanoma. *Dev Ophthalmol*. 2012;49:66-80.
23. Stallard HB. Surgery of malignant melanoma of the iris. *Br J Ophthalmol*. 1951;35(12):774-778.
24. Gelatt KN. *Veterinary Ophthalmic Surgery*. Gainsville, FL: Elsevier Saunders. Pg; 2011:22-27.
25. Sande PH, Alvarez J, Calcagno J, Rosenstein RE. Preliminary findings on the effect of melatonin on the clinical outcome of cataract surgery in dogs. *Vet Ophthalmol*. 2016;3:184-194.
26. Chow DW, Westermeyer HD. Retrospective evaluation of corneal reconstruction using ACell Vet alone in dogs and cats: 82 cases. *Vet Ophthalmol*. 2016;5:357-366.
27. Cook CS, Wilkie DA. Treatment of presumed iris melanoma in dogs by diode laser photocoagulation: 23 cases. *Vet Ophthalmol*. 1999;2:217-225.

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