Iris melanoma represents approximately 4% of all uveal melanomas. It is typical for pediatric patients to have smaller tumors, less angle seeding, and fewer episodes of elevated intraocular pressure (IOP) and glaucoma in comparison with adults. In all age groups, iris melanoma appears most frequently in the inferior portion of the eye, with a mean base of 6.2 mm and a mean thickness of 2.3 mm. In an analysis of 300 patients with iris melanoma, 85 (28%) initially manifested angle seeding for approximately 2 clock hours or more, and glaucoma was present in 104 of 299 (35%) patients.

The management of iris melanoma depends on the tumor dimensions, whether there is tumor invasion into the angle and/or posteriorly, and the presence of seeding into the angle or onto the iris stromal surface. In general, small iris melanoma with clear borders and no seeding is treated with local resection using iridectomy, iridogoniotomy, or iridogoniocyclectomy, while larger tumors with indiscriminate borders and diffuse seeding typically require enucleation or plaque radiotherapy. Cases with extensive iris or anterior chamber angle seeding may be managed with enucleation or plaque radiotherapy.

This case report describes a patient with an iris melanoma with extensive and diffuse anterior chamber angle seeding that was managed with plaque radiotherapy as an alternative to enucleation.

**CASE REPORT**

A 28-year-old man was referred for evaluation of a dark-brown iris mass in his left eye with evidence of enlargement over the previous 8 years. On examination, BCVA was 20/20 in the right eye and 20/30 in the left. IOP was 14 mm Hg in each eye. The right eye was unremarkable. In the left eye, a pigmented iris tumor in the inferior region with a basal diameter of 5 mm was detected under slit-lamp examination (Figure 1A). Gonioscopic examination revealed pigment in the angle extending for 240° in the trabecular meshwork and a small nodule temporally (Figure 1B). Upon examining the patient under transillumination, it was noted that the mass was limited to the iris without ciliary body involvement.

**Figure 1.** A 28-year-old man presented with documented enlargement of a diffuse iris melanoma with seeding. The triangular pigmented mass (A) was located inferiorly. Gonioscopy (B) revealed extensive angle seeding. Anterior segment optical coherence tomography (AS-OCT) (C; vertical orientation with inferior iris to the left) depicted slight thickening of the iris stroma.
involvement. Fundus examination was unremarkable. AS-OCT depicted a normal-appearing iris with slight thickening in the inferior quadrant (Figure 1C).

The patient was diagnosed with a diffuse iris melanoma with extensive angle invasion. Plaque radiotherapy to the entire anterior segment was provided for tumor control and in the interest of saving the globe. The patient was treated with a 15 mm iodine-125 radioactive plaque for apex dose of 7000 cGy over 96 hours.

At a follow-up visit 4 months later, the iris melanoma had regressed slightly, and there was thinning of the tumor and stabilization of the margins. BCVA was 20/20 in the right eye and 20/40 in the left. Gonioscopic examination revealed stable pigment in the inferior angle. There was no neovascularization of the iris, and the fundus was normal in appearance.

After 41 months of follow-up, BCVA was 20/20 in the right eye and light perception in the left secondary to a radiation-related dense cataract (Figure 2A). The iris melanoma and angle seeding were regressed without progression (Figure 2B). A thinned iris with bowing anteriorly, most likely due to the swollen and cataractous lens (Figure 2C), was seen on AS-OCT. The regressed melanoma was observed, and the patient was advised about the possibility of cataract surgery.

DISCUSSION

Iris melanoma is a relatively rare condition that manifests at a mean age of 50 years, most often in white individuals (98%), and with an equal distribution among men and women.\(^1\) The mean tumor size at detection is 6.2 mm base and 2.3 mm thickness. Tumor seeding into the angle—a risk for glaucoma, enucleation, and melanoma-related metastasis—is found in 28% of cases.\(^3\) The extensive iris involvement of diffuse melanoma generally necessitates enucleation, especially if the IOP is elevated. If the IOP is normal, plaque radiotherapy can be employed.

In an analysis of 144 eyes with iris melanoma managed with plaque radiotherapy, outcomes at 10 years included enucleation in 7%, tumor recurrence in 7%, metastasis in 1%, and death in 1%.\(^4\) In this study, the calculated median dose to the iris malignancy was 8000 cGy (range 6800-35 000 cGy) at the tumor apex at a median rate of 85 cGy/hr (range 59-368 cGy/hr).\(^4\) A comparison of eyes with melanoma-related glaucoma at presentation versus those without glaucoma revealed that patients presenting with glaucoma had less favorable outcomes after treatment, including higher risks for recurrence, metastasis, poor final visual acuity, and eventual enucleation. Secondary glaucoma is also a challenge to manage, as studies have confirmed it to be a risk for metastasis.\(^1\) In our patient, there was no glaucoma despite angle seeding for 8 clock hours.

Plaque radiotherapy for iris melanoma is associated with certain complications, most frequently to the anterior segment of the eye. The analysis by Shields et al noted complications at 5 years following plaque radiotherapy for iris melanoma including cataract (61%), poor visual acuity of 20/200 or worse (29%), glaucoma (26%), corneal defects (15%), corneal stromal edema (8%), and corneal superficial punctate keratitis (5%).\(^4\) Radiation can have differing effects on ocular tissue; in particular, and as is the case with the patient described here, lenticular changes may occur. In the analysis by Shields and colleagues, no patients developed radiation maculopathy or papillopathy following plaque radiotherapy for iris melanoma.\(^4\) The investigators did find, however, that cataracts typically manifest by a mean 16 months.\(^4\) In our center, our philosophy

Iris melanoma is classified as circumscribed or diffuse.\(^3\) Circumscribed melanoma is nodular with clearly visible margins, and it is often managed with surgical resection. Diffuse melanoma is a flat infiltration of the iris and can involve the entire iris surface, with scattered seeds on the stromal surface and in the angle.\(^3\) In our patient, there was no glaucoma despite angle seeding for 8 clock hours.
regarding cataract surgery in eyes with iris melanoma is that stable melanoma regression should be documented for a minimum of 3 years before the eye is opened for phacoemulsification and IOL placement because tumor stability may be important for prevention of tumor seeding. In the case described here, small incision phacoemulsification with IOL placement will be performed.

CONCLUSION

In summary, we have described a relatively young patient with diffuse iris melanoma with invasion of the angle that was treated with custom-designed plaque radiotherapy. A local side effect of radiation (cataract) was documented; however, the systemic outcome is expected to be excellent.

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