Pars Plana Vitrectomy in Eyes With Treated Posterior Uveal Melanoma

The long-term safety results are favorable.

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The indications for pars plana vitrectomy (PPV) have expanded exponentially since its inception in the 1970s.[1,2] Occasionally, a patient presents with a vitreous hemorrhage (VH) who gives a history of previously treated posterior uveal melanoma. The question then arises as to whether it is safe to perform PPV in the setting of a treated intraocular malignancy. In this article, we describe a patient who was successfully managed with PPV for VH after plaque radiotherapy of posterior uveal melanoma and discuss the authors' experience with the outcomes and risks of performing vitrectomy in this setting.

CASE DESCRIPTION

A white female aged 27 years was referred to the Oncology Service at the Wills Eye Institute for evaluation of a suspicious juxtapapillary choroidal pigmented lesion, suspected to represent melanoma. Visual acuity was 20/20 in each eye with normal intraocular pressures (IOPs). The left eye's examination was unremarkable. Fundus examination of the right eye revealed a heavily pigmented choroidal mass superior to the optic disc measuring 9.0 x 7.5 x 2.3 mm with notable lipofuscin (orange pigment) on the tumor surface and subtle subretinal fluid—both suspicious features (Figure 1A). Ultrasonography demonstrated an acoustically hollow lesion measuring 2.3 mm in thickness. This lesion was classified as a suspicious choroidal nevus vs melanoma and we advised cautious observation. Intervention with plaque radiotherapy was considered, but proximity to the optic disc and fovea led to conservative observation to avoid potential vision loss from radiotherapy. Six months later, visual acuity was 20/20, but there was additional subretinal fluid and a subtle increase in tumor size to 2.6 mm on ultrasonography (Figure 1B). The patient underwent placement of a 15-mm, notched, Iodine-125 plaque with a total radiation dose of 111 Gy to the tumor apex.

Five months after treatment, visual acuity remained 20/20, the tumor regressed to 2.1 mm, and all subretinal fluid resolved (Figure 1C). The patient did well over a period of 5 years at which time she developed a superotemporal branch retinal vein occlusion with secondary proliferative retinopathy and preretinal hemorrhage, which was treated with panretinal photocoagulation (PRP). Nine months later, she presented with hand motions visual acuity secondary to diffuse VH; IOP was normal and there was no iris neovascularization. Ultrasound confirmed a dense VH, posterior vitreous separation, no retinal detachment or visible retinal traction, and a choroidal mass 1.7 mm thick.

The VH minimally resorbed over a 1-year period. The patient then underwent uncomplicated PPV with endolaser to the bed of ischemia and retinal neovascularization, with subsequent complete resolution of hemorrhage. She was followed for a period of 13 years and her final visual acuity is 20/60, much better than one might expect.[3] Fundus exami-

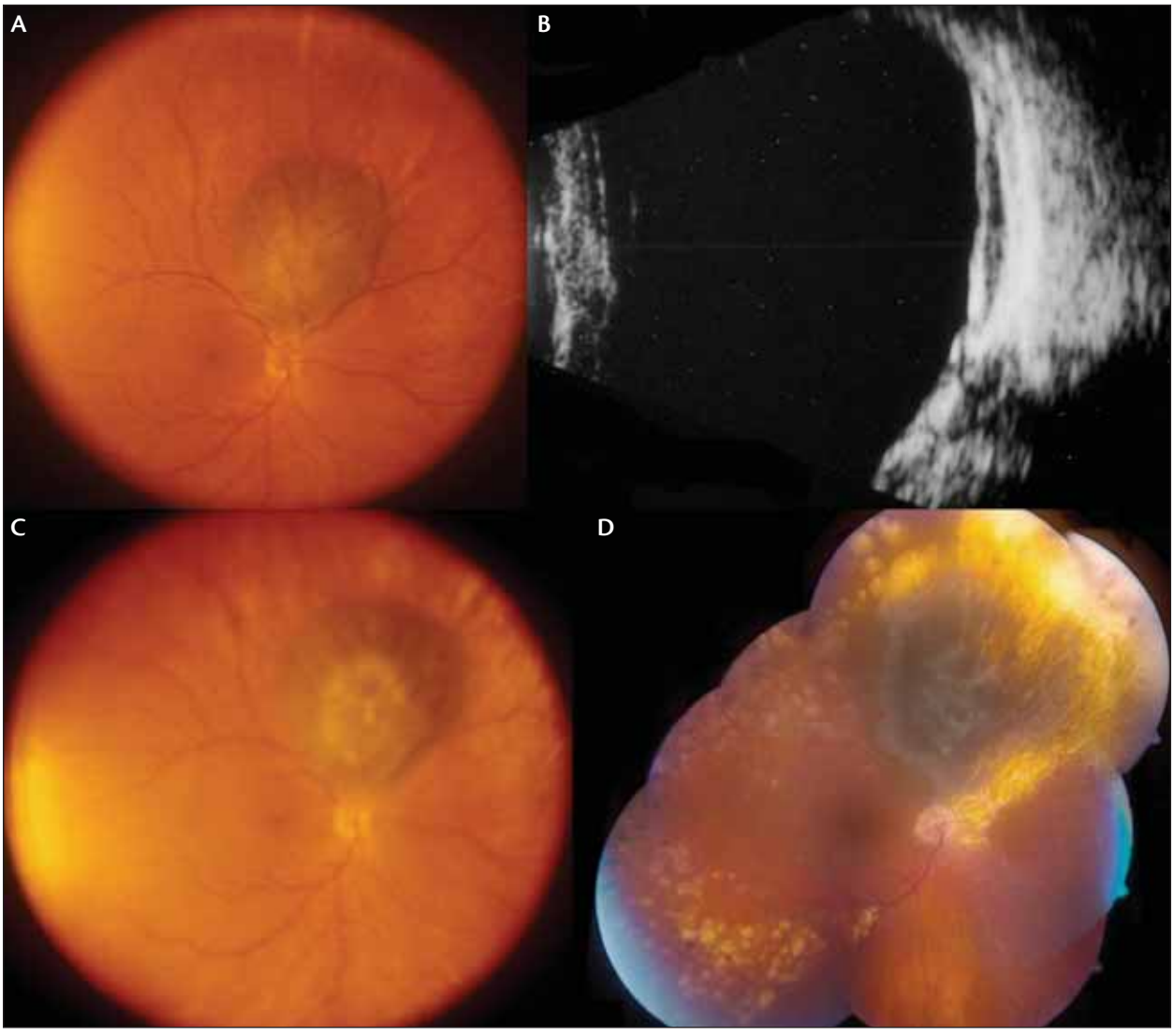

Figure 1. Fundus photo on presentation (A). B-Scan Ultrasonography prior to plaque treatment (Thickness = 2.6 mm; B). Fundus photo 5 months after Iodine-125 plaque treatment (C). Fundus photo 13 years after PPV (D).

nation currently reveals an atrophic treatment scar superior to the optic disc with peripheral laser (Figure 1D). There is no evidence of intraocular tumor dissemination, extrascleral extension, local tumor recurrence, or metastatic disease.

DISCUSSION

Vitreous hemorrahge after plaque radiotherapy for posterior uveal melanoma can be due to tumor necrosis, proliferative radiation retinopathy, posterior vitreous detachment, retinal venous occlusion, or retinal breaks.[4-6] Typically in this situation, VH is observed for clearance over a period of 3-6 months. However, if the VH is severe, persistent, recurrent, or associated with neovascularization of the iris or retinal detachment, then PPV is the option of choice. Vitrectomy benefits include improved visual acuity, better intraocular tumor surveillance, and prevention or control of secondary neovascular complications.

There are underlying concerns regarding the safety of vitreous surgery in eyes with intraocular malignancy. These include fear of local tumor dissemination, extension of malignant cells to the ocular surface and orbit, and remote metastasis. Data from transvitreal fine needle biopsy of viable choroidal melanoma (for cytologic or cytogenetic information) using a 25- or 27-gauge needle demonstrates low risk of tumor spread with this procedure. In fact, in over 1000 fine-needle aspiration biopsies over the past 35 years, we have had no case of intraocular or local tumor recurrence.[7]

With regard to vitrectomy, there is little in the literature regarding its safety in eyes with treated choroidal

melanoma. Foster and associates reported 9 eyes that had PPV following treatment of uveal melanoma and 1 patient had intraocular tumor dissemination that resulted in enucleation.[8] There were no cases of extrascleral extension. At last follow-up, all 9 patients were alive without metastasis with an average follow-up of 2 years (range, 0.5–4 years).

To further understand the safety of PPV in eyes with treated posterior uveal melanoma, we reviewed the records of 47 eyes of 47 patients who underwent PPV for VH following Iodine-125 plaque radiotherapy for posterior uveal melanoma at the Ocular Oncology Service of the Wills Eye Institute. The primary outcomes of this analysis include rates of intraocular tumor dissemination, extrascleral extension, local tumor recurrence, and systemic metastasis following PPV.

The average patient age was 57 years. The average interval between plaque application and development of VH was 22 months (range, 0–137 months). The VH was due to presumed tumor necrosis in 45% of eyes, proliferative radiation retinopathy in 28% of eyes, and posterior vitreous detachment in 15% of eyes. All eyes had evidence of tumor regression by ultrasound after plaque application and prior to PPV. The average time from the onset of VH to PPV was 13 months (range, 0–52 months).

The average time from PPV to last follow-up was 5 years (range, 0.5–16 years) for the 47 eyes. Four cases (8%) developed systemic metastasis. The mean time from plaque application to metastasis in these 4 patients was 5 years (range, 3–8 years). Only 1 patient (2%) developed local choroidal tumor recurrence and this occurred 2 years following PPV (5 years following plaque application) and was successfully managed with transpupillary thermotherapy (TTT). This patient also had 2 recurrences prior to PPV that were managed with TTT. There was no systemic metastasis 1 year after his recurrence.

There were no cases of extrascleral extension or intraocular or vitreous tumor dissemination. At last follow-up, 43 patients (92%) were alive without systemic metastasis and 4 patients (8%) were alive with metastasis. There were no deaths from melanoma or other causes at final follow-up.

SUMMARY

Our previous studies of over 8000 eyes that have undergone treatment for uveal melanoma demonstrated that 15% of patients develop metastasis by 5 years by Kaplan-Meier analysis.[9] In our present large cohort of patients undergoing PPV after treatment for posterior uveal melanoma, the mean follow-up of 5 years revealed 8% of patients developed metastasis. These results suggest that PPV in eyes with treated posterior uveal melanoma does not increase the rate of systemic metastasis and is safe. ■

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