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SHORT COMMUNICATION

Bilateral primary choroidal melanoma treated with bilateral plaque radiotherapy: A report of three cases

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PURPOSE. *To report three cases of bilateral primary choroidal melanoma treated with bilateral plaque radiotherapy.*
METHODS. *Retrospective, single-center case series.*
RESULTS. *Case 1: In 1981, a 50-year-old man was diagnosed with a 5-mm-thick choroidal melanoma in the right eye (OD) and treated with plaque radiotherapy. In 1994, a 6.8-mm-thick choroidal melanoma in the left eye (OS) was treated with plaque radiotherapy. Final visual acuity was light perception OD and 20/20 OS at 24 years follow-up. Case 2: In 1983, a 53-year-old woman was diagnosed with a 3.5-mm-thick choroidal melanoma OS and treated with plaque radiotherapy. In 2001, an enlarging 2.5-mm-thick choroidal melanoma OD was treated with plaque radiotherapy. Final visual acuity was 20/30 OD and 20/20 OS at 22 years follow-up. Case 3: In 2001, a 92-year-old man was diagnosed with a 7.9-mm-thick choroidal melanoma OD treated with plaque radiotherapy. In 2003, an enlarging 2.8-mm-thick juxtapapillary choroidal melanoma was treated with plaque radiotherapy. Final visual acuity was 20/70 OD and 20/60 OS at 2.5 years follow-up. No patient showed ocular melanocytosis. Stable tumor regression was achieved in all six eyes. Metastatic disease did not develop in any case over 16 years of follow-up.*
CONCLUSIONS. *Monitoring of both eyes of patients with uveal melanoma is important for the remote possibility of melanoma in the second eye. In these three patients, plaque radiotherapy allowed for preservation of the globes and some vision. (Eur J Ophthalmol 2006; 16: 879-82)*

KEY WORDS. *Eye, Uvea, Choroid, Bilateral, Melanoma, Plaque radiotherapy*

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INTRODUCTION

Choroidal melanoma is typically a unilateral, unifocal condition, affecting approximately 2,000 persons annually in the United States. Bilateral occurrence of choroidal melanoma is extremely uncommon. In a review of 4500 patients with uveal melanoma on the Oncology Service at Wills Eye Hospital, 8 (0.18%) were bilateral (1). Bilateral choroidal melanoma can occur simultaneously or sequentially. Sequential melanomas have been found at a mean of 8.8 years and the longest interval was 32 years (1-3). Special therapeutic considerations for conservative, nonenucleation methods are important when a patient has bilateral melanoma. Conservative methods include transpupillary thermotherapy (TTT), plaque radiotherapy, charged particle radiotherapy, local resection, or combination therapies. In this report, we describe three patients with bilateral primary choroidal melanoma treated with bilateral plaque radiotherapy.

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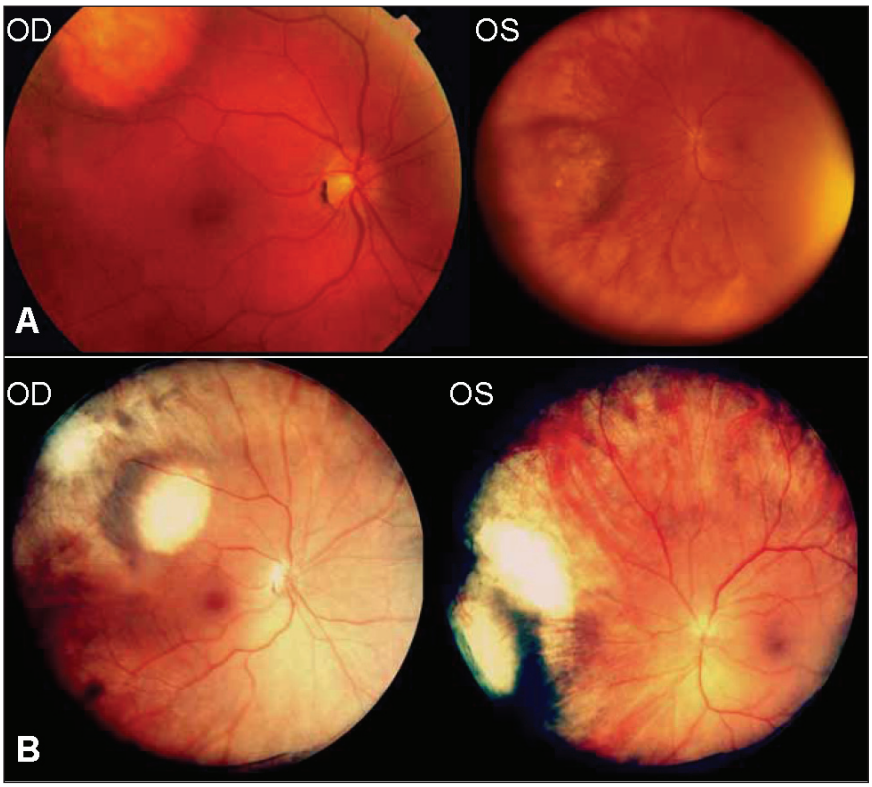

Fig. 1 - *Case 2. Bilateral choroidal melanoma treated with bilateral plaque radiotherapy.* (**A**) *Before plaque radiotherapy. In the right eye, a 3.5-mm-thick amelanotic choroidal melanoma located superotemporally was detected in 2001. In the left eye, a lightly pigmented 2.5-mm-thick choroidal melanoma was noted in the nasal periphery in 1983.* (**B**) *After plaque radiotherapy. In both eyes the choroidal melanoma showed stable regression with choroidal atrophy and residual flat pigment. There were no radiation maculopathy or papillopathy at 22 years follow-up.*

Case reports

The cases are summarized in Table I.

Case 1

In 1981, a 50-year-old man was diagnosed with a choroidal melanoma in the right eye (OD) measuring 14 x 12 x 5 mm. The patient did not have ocular melanocytosis or skin melanoma. The choroidal melanoma was treated with cobalt-60 plaque radiotherapy and tumor regression to a thickness of 2.5 mm was achieved. In 1990, a small pigmented choroidal lesion was first noticed in the left eye (OS), and this lesion grew into a melanoma measuring 15 x 13 x 6.8 mm in 1994. The left eye was treated with iodine-125 plaque radiotherapy. In 2005, both treated choroidal melanomas were regressed and visual acuities were light perception OD and 20/20 OS. There was no evidence of systemic metastasis.

Case 2

In 1983, a 53-year-old woman was found to have a choroidal melanoma OS measuring 9 x 8 x 3.5 mm. The patient did not have ocular melanocytosis or skin melanoma. Treatment with iridium-192 plaque radiotherapy was employed. In 1995, a new amelanotic choroidal lesion OD was noticed, and this lesion showed documented enlargement, measuring 6 x 6 x 2.5 mm in 2001. This melanoma was treated with iodine-125 plaque radiotherapy. At final visit in 2005, the melanomas in both eyes were regressed and visual acuity was 20/30 OD and 20/20 OS (Fig. 1). The patient showed no systemic metastasis.

Case 3

In 2001, a 92-year-old man was diagnosed with a superiorly located choroidal melanoma OD measuring 12 x 12 x 7.9 mm and a juxtapapillary choroidal nevus OS measuring 7 x 6 x 1.8 mm. The patient did not have ocular melanocytosis or skin melanoma. The choroidal melanoma OD was treated with an iodine-125 plaque radiotherapy and regression in thickness to 4.4 mm was achieved. The juxtapapillary choroidal nevus OS grew into melanoma of 2.8 mm in thickness and was treated with an iodine-125 plaque radiotherapy in 2003. Six months later, both melanomas were regressed and visual acuities were 20/70 OD and 20/60 OS (Fig. 2). There was no evidence of systemic metastasis.

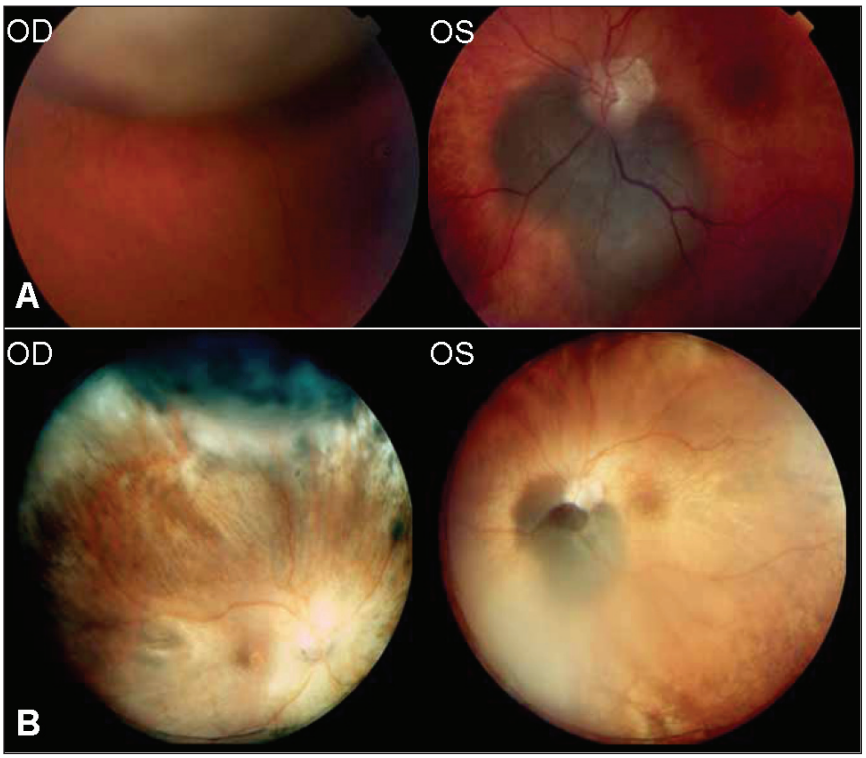

Fig. 2 - *Case 3. Bilateral choroidal melanoma treated with bilateral plaque radiotherapy.* (**A**) *Before plaque radiotherapy. In the right eye, a 7.9-mm-thick choroidal melanoma was detected in 2001. In the left eye, a juxtapapillary choroidal nevus grew into a 2.8-mm-thick melanoma in 2003.* (**B**) *After plaque radiotherapy. In both eyes stable tumor regression was achieved at 2.5 years follow-up.*

COMMENT

Bilateral primary uveal melanoma is rare. Three independent reviews of patients with uveal melanoma have reported bilateral melanoma in 0.18% of 4500 patients, 0.22% of 1835 patients, and 0.20% of 2461 patients (1-3). Genetic factors have not been identified in bilateral uveal melanoma, but ocular melanocytosis is suspected to be more common in these cases (1).

In our previous series of eight patients with bilateral uveal melanoma, two showed bilateral ocular melanocytosis and no patient had a family history of uveal or skin melanoma. In this series of three patients, there was no case of melanocytosis or family history of skin or uveal melanoma.

Of the 17 previously reported cases of bilateral uveal melanoma, 4 patients (24%) presented with simultaneous melanoma and 13 patients (76%) showed sequential melanoma, at a mean interval of 8.8 years between the two affected eyes (1-3). In our three cases, the interval was 13, 18, and 2 years, respectively. Yanoff and Zimmerman found that 73 of 100 uveal melanomas had their origin in pre-existing nevi

TABLE I - CLINICAL FINDINGS OF THREE PATIENTS WITH BILATERAL PRIMARY CHOROIDAL MELANOMA TREATED WITH BILATERAL PLAQUE RADIOTHERAPY

Case	Age/sex	First eye Tissue/Thickness mm	Interval (years)	Second eye Tissue/Thickness mm	Final visual acuity		Total follow-up (years)
					First eye	Second eye	
1	50/M	Choroid/5.0	13	Choroid/6.8	LP	20/20	24
2	53/F	Choroid/3.5	18	Choroid/2.5	20/30	20/20	22
3	92/M	Choroid/7.9	2	Choroid/2.8	20/70	20/60	2.5

Interval, yr = Interval between the development of melanoma in first and second eyes

histopathologically (4), and McLean et al found that it took a mean of 7 years for choroidal melanomas to enlarge from 10 mm to 15 mm in basal diameter (5). In our cases enlargement of small choroidal lesions into melanoma was documented in 4 years (Case 1) and 6 years (Case 2). These lesions are considered as melanomas arising de novo rather than pre-existing benign choroidal nevus.

The management of bilateral uveal melanoma has varied in the literature with enucleation being performed for at least one of the eyes in 10 of 17 reported cases (1-3). Bilateral plaque radiotherapy has been performed in four published cases, two of whom had simultaneous melanoma with simultaneous plaque radiotherapy and two with sequential melanoma (1-3, 6). Our series of three sequential melanomas treated with plaque radiotherapy offers evidence that conservative treatment is useful for preservation of the globe and some vision, especially if the tumor is bilateral or the patient encounters another serious ocular condition in the opposite eye. Different sources of radioactive material were applied for each patient depending on the isotope in use at the time. No obvious radiation side effects were seen, even with iridium-192, which has a greater risk to cause radiation side effects (7). Case 1 in our series has been previously reported as sequential melanoma (6).

The primary goal of uveal melanoma management is to save the patient's life, and secondary goals are to spare the eye and vision. The Collaborative Ocular Melanoma Study revealed that life prognosis for patients with medium size choroidal melanoma is similar with plaque radiotherapy compared to enucleation (8). Visual acuity, however, can suffer following ocular radiotherapy and Shields and associates reported poor visual acuity of 20/200 or worse at 5 years after plaque radiotherapy in 24% of patients with small melanoma (≤3.0 mm), 30% with medium melanoma (3.1–8.0 mm), and 64% with large melanoma (>8.0 mm) (9). In the current study, plaque radiotherapy allowed for preservation of visual acuity in five of the six eyes.

In conclusion, bilateral uveal melanoma represents only 0.2% of all patients with uveal melanoma. Regular examination of both eyes of patients with uveal melanoma is emphasized. Plaque radiotherapy was a beneficial treatment modality for our patients by providing tumor control in all cases and preservation of vision in at least one eye in all cases.

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REFERENCES

1. Singh AD, Shields CL, Shields JA, De Potter P. Bilateral primary uveal melanoma. Bad luck or bad genes? Ophthalmology 1996; 103: 256-62.
2. Bhouri L, Lumbroso L, Levy C, et al. [Bilateral uveal melanomas. Five case reports.] J Fr Ophtalmol 2003; 26: 149-53.
3. Hadden PW, Damato BE, McKay IC. Bilateral uveal melanoma: a series of four cases. Eye 2003; 17: 613-6.
4. Yanoff M, Zimmerman LE. Histogenesis of malignant melanomas of the uvea. II. Relationship of uveal nevi to malignant melanomas. Cancer 1967; 20: 493-507.
5. McLean IW, Foster WD, Zimmerman LE, Martin DG. Inferred natural history of uveal melanoma. Invest Ophthalmol Vis Sci 1980; 19: 760-70.
6. Lois N, Shields CL, Shields JA, De Potter P, Ramsey MS. Trifocal uveal melanoma. Am J Ophthalmol 1997; 124: 848-50.
7. Gunduz K, Shields CL, Shields JA, Cater J, Freire JE, Brady LW. Radiation retinopathy following plaque radiotherapy for posterior uveal melanoma. Arch Ophthalmol 1999; 117: 609-14.
8. Diener-West M, Earle JD, Fine SL, et al. The COMS randomized trial of iodine 125 brachytherapy for choroidal melanoma, III: initial mortality findings. COMS Report No. 18. Arch Ophthalmol 2001; 119: 969-82.
9. Shields CL, Shields JA, Cater J, et al. Plaque radiotherapy for uveal melanoma: long-term visual outcome in 1106 consecutive patients. Arch Ophthalmol 2000; 118: 1219-28.