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Case Report

Photodynamic Therapy Combined with Intravitreal Bevacizumab in a Patient with Choroidal Neovascularization Secondary to Choroidal Osteoma

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Choroidal osteoma is a benign ossified tumor that is found predominantly in healthy young women during their second and third decades of life. The lesions are white-to-cream or orange in color, are located in the peripapillary and macular areas, and are unilateral in most patients. The symptoms of choroidal osteoma include decreased visual acuity and metamorphopsia or scotoma corresponding to the location of the osteoma, but some patients have no symptoms. Prognosis of vision varies according to tumor location, retinal pigment epithelial and sensory retinal degeneration, subretinal fluid and hemorrhage, and development of a subretinal neovascular membrane.

Key Words: Bevacizumab, Choroidal osteoma, Photochemotherapy

We describe here an atypical case of choroidal osteoma in the posterior pole that caused visual disturbance and metamorphopsia of the right eye. It was treated with photodynamic therapy (PDT) combined with an intravitreal bevacizumab (Avastin; Genetech Inc., San Francisco, CA, USA) injection.

Case Report

A 48-year-old woman with no remarkable medical history presented with decreased visual acuity and metamorphopsia in her right eye, which had gradually progressed over several months. Her best-corrected visual acuity (BCVA), measured on a Snellen chart, was 0.5, and her intraocular pressure, as determined on the Goldmann applanation tonometer (Haag Streit, Bern, Switzerland), was 14 mmHg. The results an examination of the anterior segment were unremarkable. An examination of the fundus showed a well-defined, 4.9 by 5.2 mm, whitish-yellow and slightly elevated lesion in the posterior pole (Fig. 1A). Fluorescein angiography and optical coherence tomography (OCT) showed retinal pigment epithelial degeneration, macular edema and subretinal hemorrhage, suggesting choroidal neovascularization (CNV) (Fig. 1C and 1E). These findings resulted in a diagnosis of choroidal osteoma. Treatment was recommended using a combination of PDT with verteporfin and intravitreal bevacizumab (Avastin) injections at 5-day intervals. Two weeks later, the fluorescein angiography showed that the subretinal hemorrhage and leaking of the fluorescein dye had decreased and her metamorphopsia had improved. Four weeks after starting treatment, her BCVA had improved to 0.8, and to 1.0 after 12 weeks. Follow-up at 12 weeks showed no complications (Fig. 1B, 1D, and 1F)

Discussion

Choroidal osteoma is a rare ossified tumor, first described in 1978, found predominantly in healthy young women, and appears in a unilateral position in most patients [1,2]. At presentation, 51% of these tumors are grow-

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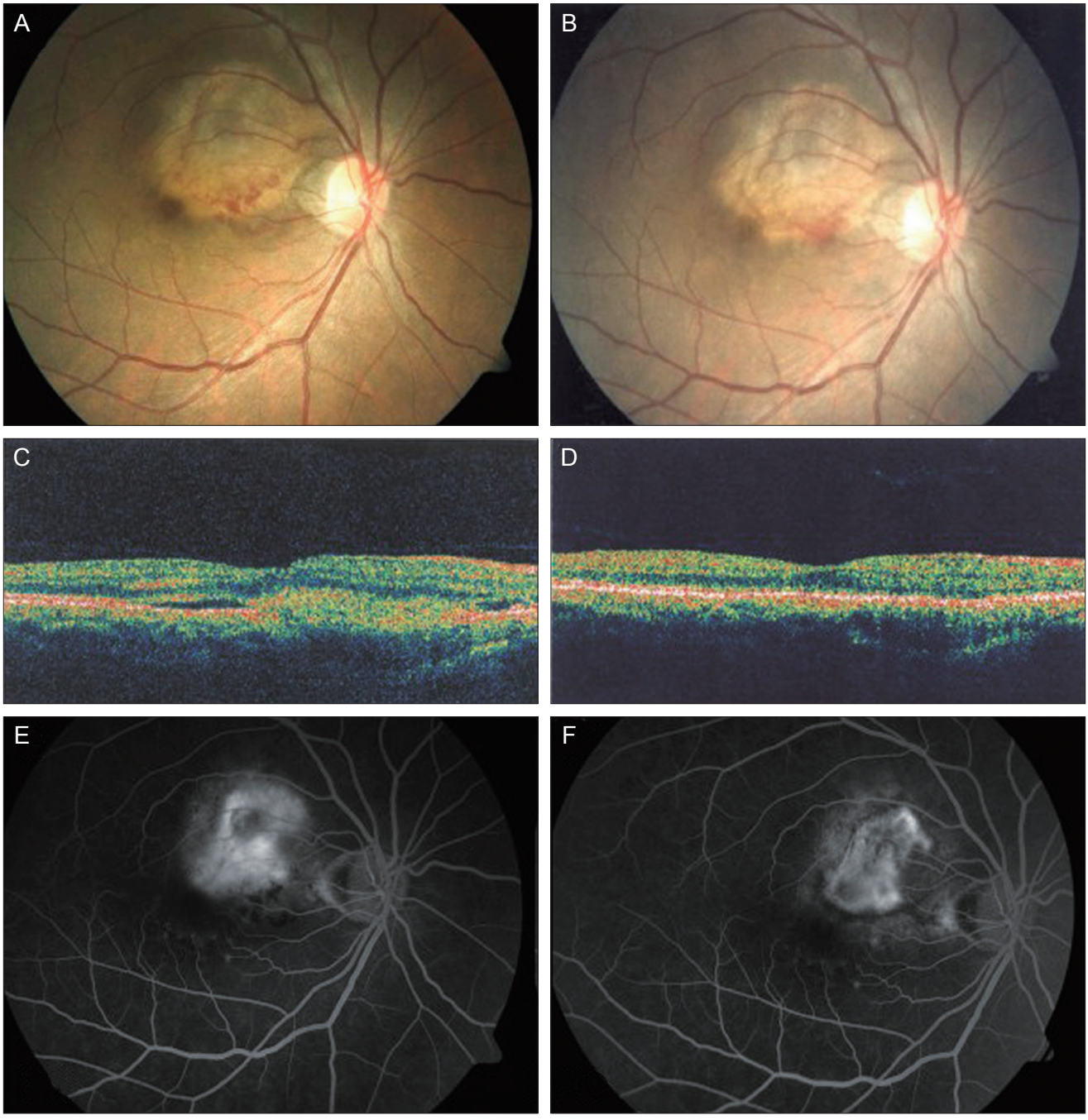

Fig. 1. (A) Fundus photography showed a choroidal osteoma with subretinal hemorrhage, suggestive of choroidal neovascularization (CNV). (B) Fundus photography (2 weeks after treatment) showed decreased subretinal hemorrhage and decalcification of the tumor. (C) Optical coherence tomography showed the presence of CNV. (D) Optical coherence tomography (12 weeks after treatment) showed CNV. (E) Fluorecein angiography showed irregular hyperfluorecence, leakage confirmed intense CNV staining in the late stages. (F) Fluorecein angiography showed (12 weeks after treatment) that dye leakage had decreased during the late stages.

ing, 46% show decalcification and 31% show CNV [3]. Subretinal fluid, hemorrhage and alterations in photoreceptors associated with CNV can reduce visual acuity, but the mechanism of CNV is unknown. Treatments include PDT, intravitreal bevacizumab (Avastin) or ranibizumab (Lucentis; Genentech Inc., South San Francisco, CA, USA), laser photocoagulation and thermotherapy. These treatments are designed to conserve the fovea by decalcifying the osteoma, ultimately resulting in suppression of CNV.

PDT was found to cause the regression of a subfoveal

choroidal osteoma accompanied by CNV. The beneficial effects of PDT include not only improvements in visual acuity and metamorphopsia, but a reduction in the size of the CNV, as shown by OCT, and a reduction in leakage during late stage fluorescein angiography [4-6]. In contrast, intravitreal injection of an anti-vascular endothelial growth factor (VEGF) antibody was reported to be superior to PDT, and the latter was associated with poor visual outcome and the possible need for multiple re-treatments [7-9].

In patients with CNV due to age-related macular degeneration, treatment combinations of PDT and intravitreal anti-VEGF injection have been tried. Although these combination therapies have not proven to be superior to using either agent alone, it reduces the risk of multiple PDT, which may induce CNV recurrence by aggravating choroidal ischemia and subsequent over-expression of VEGF [10,11]. In addition, Rishi et al. [12] reported that combination therapy with PDT and intravitreal bevacizunmab appeared to be effective in the treatment of CNV secondary to toxoplasma retinochoroiditis.

Therefore, we utilized a combination of PDT with verteporfin and intravitreal bevacizumab (Avastin) with our 48-year-old female patient who had presented with decreased visual acuity in her right eye due to CNV secondary to choroidal osteoma. Two weeks later, we found that the subretinal hemorrhage had decreased due to the suppression of CNV. Her BCVA improved to 0.8 at 4 weeks and to 1.0 at 16 weeks, and there were no complications throughout the 16 week follow-up period. These results indicate that the combination of PDT with verteporfin and intravitreal anti-VEGF injection could have a synergistic effect that could reduce the need for repeated injections in the treatment of choroidal osteoma with CNV, especially in cases of large sized, and those non-responsive to anti-VEGF injections or PDT alone. Larger studies with longer follow-up may reveal that the visual outcome with combination therapy could be better than PDT or anti-VEGF alone.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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