Successful Use of Anti-VEGF Treatment for Subretinal Hemorrhage and Fluid in a Young Patient with Choroidal Osteoma

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ABSTRACT: The authors report the use of an anti-VEGF agent in the resolution of subretinal fluid and hemorrhage with improvement in best corrected visual acuity (BCVA) in a patient with choroidal osteoma. The reported case involves a 20-year-old man who presented with a choroidal osteoma and chronic subretinal fluid associated with hemorrhage. He was treated with six intravitreal doses of bevacizumab over a 13-month period. The fluid resolved and his BCVA improved with these treatments. Intravitreal bevacizumab can be used to successfully treat subretinal fluid associated with choroidal osteomas and may lead to an improvement in BCVA.


INTRODUCTION

Choroidal osteomas (CO) are an uncommon and generally benign choristoma of osseous tissue in the choroid. CO most commonly present with a mild decrease in vision, but other presentations may include visual field defects, metamorphopsia, or severe visual loss. The prognosis is generally good for extrafoveal osteomas, but with subfoveal osteomas or retinal pigment epithelium disruption there can be a slow degeneration of vision. More acute visual loss can often be attributed to hemorrhage and serous subretinal fluid (SRF).

Previous treatment modalities include laser photocoagulation, often requiring multiple treatments, and was not uniformly successful, perhaps due to the lack of melanin and/or the thinned and disrupted retinal pigment epithelium (RPE). There have also been reported successful use of photodynamic therapy in CO-related choroidal neovascular membrane (CNVM).

There has been one other report of CO-related CNVM treated with anti-VEGF agents, although this original case had primarily intraretinal cystic fluid. We report here the first case of CO with a hemorrhagic CNVM and extensive SRF that was successfully treated with an anti-VEGF agent.

CASE REPORT

Institutional review board approval for a case report was obtained.

A 20-year-old man presented with decreased vision in the right eye. BCVA was 20/80 in the right eye and 20/20 in the left eye. Funduscopy examination demonstrated large orange-colored subretinal masses (Figure 1A, page 170). OCT demonstrated SRF in the right eye (Figures 1B and 3A). B-scan ultrasonography demonstrated dense, hyperechoic masses with significant shadowing in both eyes (Figure 1C-D).

The patient was followed up over the next year with SRF in the macular region in both eyes that would wax and wane over time. He returned 20 months after initial presentation with a decreased BCVA of 20/40 in the right eye. Clinical examination showed the CO unchanged, and OCT demonstrated increased SRF in the right eye (Figure 3B, page 171). A fluorescein angiogram was obtained showing a diffuse leaking at the inferior edge of the CO, in keeping with an occult CNVM. Intravitreal bevacizumab 1.25 µg was administered in the right eye.
After 4 months, the OCT again showed a slight improvement in SRF (Figure 3C). The BCVA in the right eye was 20/60, and a third dose of bevacizumab was administered.

Two months later the BCVA in the right eye was now 20/50. Clinical examination demonstrated a small hemorrhage towards the foveal center (Figure 1E). Fundus autofluorescence showed diffuse hypautofluorescence changes through the macula extending downward as fluid pooled below the inferior arcade (Figure 1F). OCT demonstrated a decrease in SRF (Figure 3D). Bevacizumab treatment was repeated.

After a series of three more injections over 6 months, the vision in the right eye was stable at 20/40. There was no fluid evident on OCT (Figure 3E).

**DISCUSSION**

CO is an uncommon osseous choristoma of the posterior pole. CO is more common in Caucasian women in the second and third decade. It has been described in men and patients of African and Asian decent, indiscriminate of age, and is unilateral in 75% of cases. While generally considered congenital, CO occasionally results from inflammation, trauma, hormonal alterations, or other metabolic disorders. COs are ovoid with scalloped edges, may demonstrate some elevation, and can range from about one disc diameter to over 20 mm. Complications include growth of the tumor, serous subretinal fluid exudation, subretinal choroidal neovascularization, and hem-

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**Figure 1.** (A) Color and red-free photographs in both eyes. (B) OCT of subretinal fluid in the right eye. (C) B-scan ultrasonography in the right eye showing hyperechoic mass. (D) B-scan ultrasonography in the left eye showing hyperechoic mass. (E) Optos wide-field color photograph in the right eye showing the choroidal osteoma. (F) Optos fundus autofluorescence in the right eye.

**Figure 2.** (A) Mid-phase fluorescein angiogram (FA) in the right eye showing mottled leaking of fluorescein. (B) Late phase of the same FA showing mild leakage in the right eye.
While the first reports of this tumor were in the late 1970s, there has been an increase in recognition of this entity over time because distinguishing it from other tumors is increasingly possible with current imaging modalities. This case represents the use of an anti-VEGF agent in CNMV due to CO. While anti-VEGF agents are the standard of care for neovascularization in age-related macular degeneration, there have been no controlled trials in many other neovascularizing processes. To our knowledge there has been only one other reported use of anti-VEGF agents in CO, and this case was characterized by an acute subretinal hemorrhage with mild intraretinal and subretinal fluid demonstrated on OCT. Our patient had a chronic, larger pocket of subretinal fluid that waxed and waned for over a 2-year period before treatment was initiated. The fluorescein angiogram (Figure 2) demonstrates a focal mottled RPE leak of fluid consistent with occult CNVM. The chronic nature of the subretinal fluid, acutely increased, along with the acute hemorrhage demonstrated increased activity of the CNVM and so the decision to undertake treatment with anti-VEGF was taken. The patient required a total of six treatments over 13 months but experienced an eventual complete resolution of hemorrhage and fluid over this time period.

Visual loss can be from RPE disruption due to the mass itself or from CNVM and the sequelae that typically result from hemorrhage and exudate. There are currently no consistent treatment modalities for CO-related CNVM. There have been case series reporting the use of laser photocoagulation and photodynamic therapy, but nothing widely employed in the treatment of visual loss from CO-related CNVM. We demonstrate the use of anti-VEGF agents in treating chronic subretinal fluid and hemorrhage as a complication of CNVM in a young patient with a choroidal osteoma.

REFERENCES