

Outcome of Intravitreal Anti-VEGF Injection to Treat Choroidal Neovascularization Associated with Choroidal Nevus

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Abstract

Purpose: To report the outcomes of two Choroidal Neovascularization (CNV) cases associated to Choroidal Nevus (CN) treated with intravitreal anti-VEGF drug injections.

Patients: Patients underwent complete ophthalmologic evaluation, including fluorescein angiography (FA), optical coherence tomography (OCT) and autofluorescence image (FAF). Data were prospectively analyzed to evaluate Best Corrected Visual Acuity (BCVA) changes and clinical, FA, OCT and FAF evolution. CNVs were treated by intravitreal anti-VEGF injections (bevacizumab and ranibizumab).

Results: Six months after anti-VEGF treatment, BCVA improved, FA showed no leakage from CNV and OCT reflected no intraretinal fluid in both cases. Two bevacizumab and three ranibizumab intravitreal injections were performed to obtain CNV stabilization respectively.

Conclusion: Anti-VEGF therapy is a viable option to treat CNV associated with CN. Further studies with more patients are needed to establish the real efficacy of this treatment.

Keywords: Anti-VEGF; Choroidal Neovascularization; Choroidal Nevus

Abbreviations

CN: Choroidal Nevus; RPE: Retinal Pigmentary Epithelium; CNV: Choroidal Neovascularization; PDT: Photodynamic Therapy; VEGF: Anti-Vascular Endothelial Growth Factor; AMD: Age-Related Macular Degeneration; BCVA: Best-Corrected Visual Acuity; FA: Fluorescein angiography; OCT: Optical Coherence Tomography; FAF: Fundus Autofluorescence

Introduction

Choroidal Nevus (CN) is the most common benign intraocular tumor present in 20% of the caucasian adult population [1]. They are not often associated with clinical symptoms and can be observed as an incidental finding during routine ophthalmoscopic examinations in approximately 6% of eyes [2]. Loss of visual acuity is detected in up to 11% of cases, which are secondary to serous retinal detachment and degeneration of photoreceptors, either combined with modifications of retinal pigmentary epithelium (RPE) cells or induced by choroidal neovascularization (CNV) [3].

Transpupillary thermotherapy [4], photodynamic therapy (PDT) with verteporfin [1,5] and laser photocoagulation (LP) [3,6,7] have been respectively used for subfoveal and extrafoveal CNV associated to CN. Anti-Vascular Endothelial Growth Factor (VEGF) therapy has been demonstrated as a useful treatment for CNV associated with Age-related Macular Degeneration (AMD) and pathologic myopia [8-

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10]. Chiang A., *et al.* [11] have published a series of 10 cases with intravitreal bevacizumab for CNV associated with CN, similar to Cavalcante ML., *et al.* [12] with a review of 27 eyes of 27 patients with choroidal nevus treated for secondary vascular activity with intravitreal injections of bevacizumab.

Aim of the Study

The aim of this paper is to report the outcomes of treating CNV associated with CN by intravitreal anti-VEGF drug injection in two patients.

Cases Report

Case 1: A 67-year-old man presented loss of vision and metamorphopsia in his right eye over a 5 day period. His medical history revealed systemic hypertension and cutaneous malignant melanoma on his back which was completely removed 7 years ago. Best-Corrected Visual Acuity (BCVA) was 20/63 in the right eye and 20/20 in the left eye. Fundus examination of the right eye revealed a CN temporal to the fovea with central haemorrhage and a detachment of the neural retina around CN. Fluorescein angiography (FA) disclosed a classic extrafoveal CNV in the centre of CN. Optical Coherence Tomography (OCT) displayed a hyperreflective lesion and subretinal fluid. Fundus autofluorescence (FAF) was performed to find hypoautofluorescence in the lesion. After three intravitreal ranibizumab injections, CNV showed complete closure, with no FA leakage and BCVA of 20/20, which persisted during the 6-month follow-up. CNV showed fibrotic evolution with no surrounding pigmentary changes. The FAF lesion displayed a central hyper with a ring of hypoautofluorescent (Figure 1).

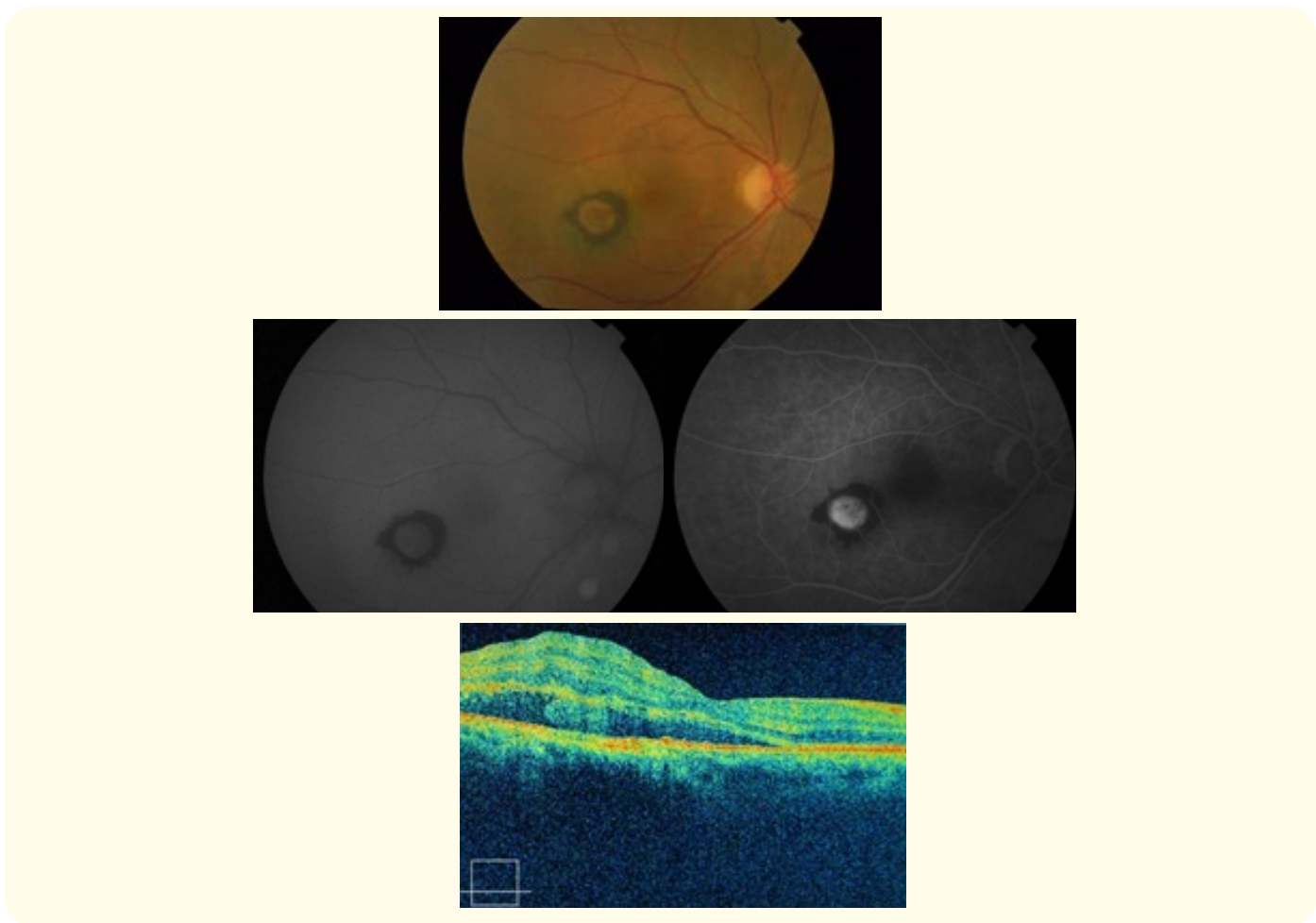
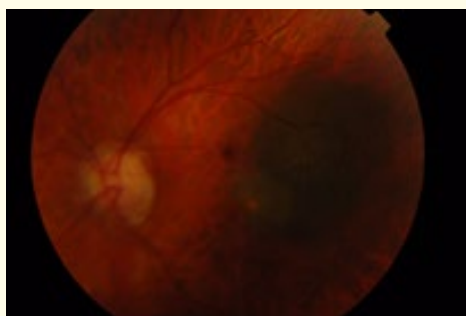




Figure 1: In the upper file initial color retinography, fundus autofluorescence, fluorescein angiography and optical coherence tomography images. BCVA was 20/63. In the lower file six months after three intravitreal injection ranibizumab, the neovascular lesion was completely inactive. BCVA was 20/20.

Case 2: A 44-year-old woman came to the ophthalmologist with a 24-hour history of progressive visual deterioration and metamorphopsia in her left eye. Her medical history revealed high myopia. Baseline BCVA was 20/20 in her right eye and 20/63 in her left eye. Fundus examination of the left eye revealed CN temporal to the fovea with peripheral haemorrhage and a neural retinal detachment around CN. FA disclosed a juxtafoveal classic CNV on the edge of CN. OCT study shows a hyperreflective lesion. After two intravitreal bevacizumab injections, CNV was completely obliterated, and BCVA of 20/25, which persisted during the 6-month follow-up. CNV presented fibrosis with no surrounding pigmentary changes (Figure 2).



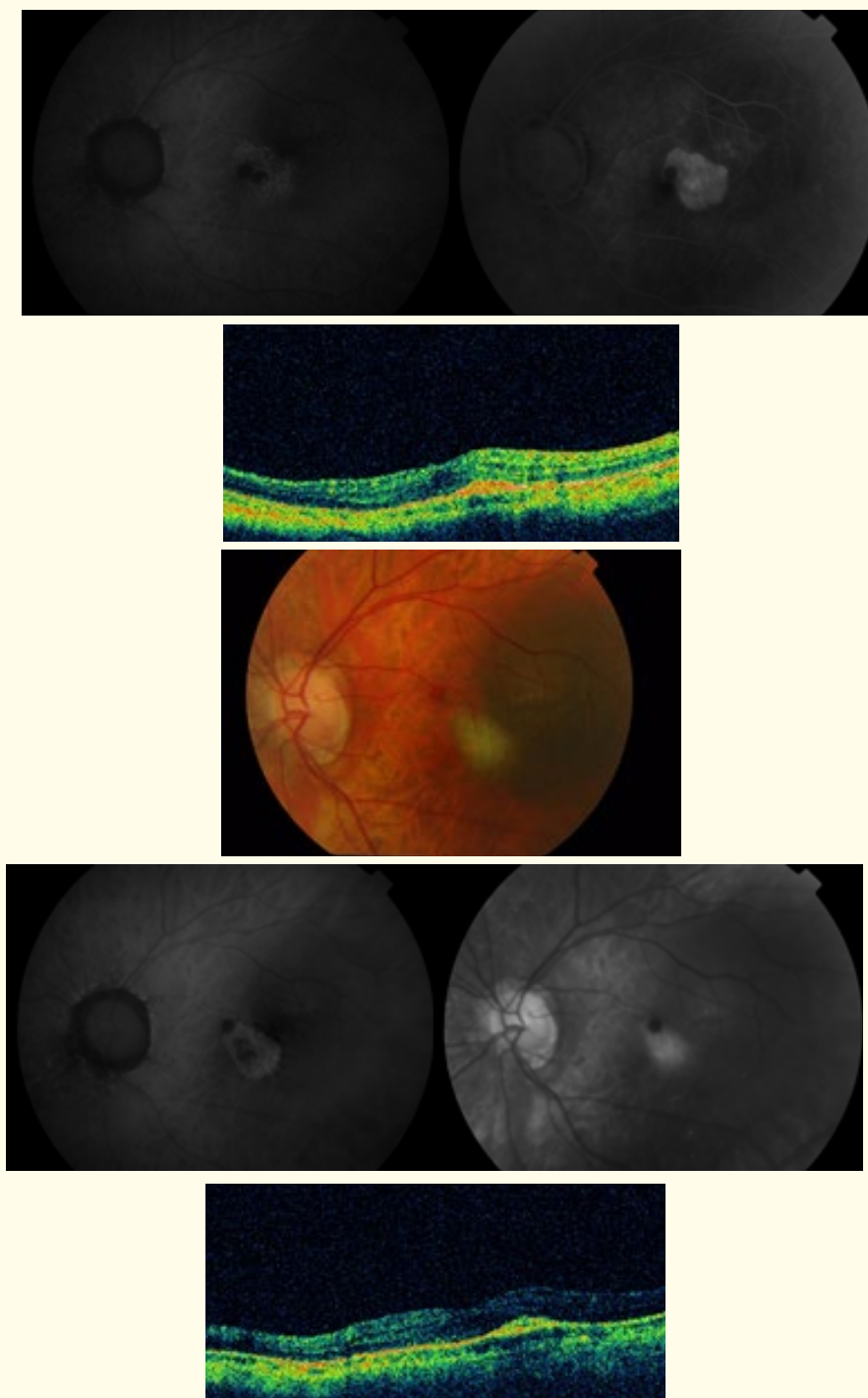


Figure 2: In the upper file initial color retinography, fundus autofluorescence, fluorescein angiography and optical coherence tomography images. BCVA was 20/63. In the lower file six months after two intravitreal injection bevacizumab, the neovascular lesion was completely inactive. BCVA was 20/25.

Discussion

CNV is present in up to 8 % of rare cases of visual loss associated with CN (11%) [2]. Approximately 50 well-documented cases have been reported describing the various clinical features of this complication [3]. There have been reports that the presence of CNV on the surface of a pigment tumour suggests that the tumour has been present for several years and, consequently, presents low growth potential [13].

In general, CNV-related CN presents a lesser degree of activity if compared to CNV associated with other diseases such as AMD [6]. However, CNV-related CN leads to progressive deterioration of visual acuity if left untreated [7]. In addition, serous retinal detachment, subretinal blood and dye leakage in FA in association with visual acuity deterioration have been described as negative prognostic factors for visual function [2,3,7].

In our two cases, the treatment of first patient with extrafoveal CNV could have been LP. In the second case the results juxtafoveal location choose any of three options: LP, PDT or intravitreal VEGF injections. To date, CNV associated with CN has been treated by PDT with verteporfin, thermotherapy or LP for subfoveal or extrafoveal localization respectively [1,3-7]. However, no case of juxtafoveal CNV related to CN has been published. This type of CNV could be treated by LP despite secondary scotoma to laser treatment. Subfoveal CNV contraindicates conventional LP, and requires alternative options [6].

Currently, intravitreal injection of anti-VEGF drugs is the first subfoveal and juxtafoveal CNV treatment choice [8,9,14]. In our two cases of CNV associated with CN, we specifically selected intravitreal anti-VEGF injections to avoid any aggression to CN cells which, although minimum in both cases with PDT or LP treatment are affected by laser irradiation.

RPE depigmentation develops in some cases of CNV after PDT treatment, which may be interpreted as the result of either long-standing neural retinal detachment or RPE damage secondary to PDT. In all published case reviews [1-7], CN shows no change during follow-up and no treatment-related side effects are registered.

However, one issue of concern is the biological effect on melanocytes following exposure to nonlethal low-energy laser irradiation. Stimulation of melanocyte proliferation and migration has been subsequently observed to the exposure of these cells "in vitro" to the media derived from keratinocytes exposed to low-energy lasers [15,16]. Therefore, possible long-term mutagenic risks may exist. Although there are no data available to suggest that the lasers employed to treat CNV-related CN have such properties, there are other treatments that avoid mutagenic risks and aggression on CN cells, which are efficacious in treating CNV associated with either AMD [8,9,17] or pathologic myopia [10].

Similar to other publications, intravitreal anti-VEGF appears to be an effective treatment option for CNV associated with CN [11,12]. Further studies with more cases and a longer follow-up are required to assess the genuine efficacy and safety of this therapy.

Conflict of Interest

None.

Presentation at a Conference

None.

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