SHORT COMMUNICATIONS & CASE REPORTS

Choroidal neovascularization in angioid streaks and pseudoxanthoma elasticum: 1 year follow-up

D. SCHIANO LOMORIELLO, M. PARRAVANO, A. CHIARAVALLOTI, M. VARANO

Fondazione G.B. Bietti-IRCCS, Roma - Italy

PURPOSE. *To report the efficacy of intravitreal injection of bevacizumab 1.25 mg (IVB) in the treatment of choroidal neovascularization (CNV) secondary to angioid streaks (AS).*
METHODS. *Case review of two patients with CNV secondary to AS treated with three IVB with a 1-year follow-up.*
RESULTS. *In both patients after 1 year fluorescein angiography and optical coherence tomography showed complete inactivity of the CNV and the ophthalmologic examination revealed stabilization of the visual acuity.*
CONCLUSIONS. *The IBV appeared to be an effective and safe treatment for CNV secondary to AS resulting in a long-term CNV inactivation. Further long-term studies in this type of lesion are desirable. (Eur J Ophthalmol 2009; 19: 151-3)*

KEY WORDS. *Intravitreal bevacizumab, Avastin, Choroidal neovascularization, Angioid streaks, Anti-VEGF*

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INTRODUCTION

Choroidal neovascularization (CNV) is the major cause of vision loss associated with angioid streaks (AS) (1). CNV occurs in 70% to 86% of patients and more than half have a visual acuity of 20/200 or worse after 50 years. Different treatment options have been proposed for these lesions, such as laser photocoagulation, photodynamic therapy (PDT), transpupillary thermotherapy (TTT) and, rarely, macular translocation, with mixed results that are often complicated by recurrences and progressive vision loss. Although PDT delays the growth of the CNV in AS and the consequent visual loss compared to the natural course of the disease, its long-term efficacy is limited (2).
Off-label use of intravitreal bevacizumab (IVB) has been introduced for the treatment of CNV secondary to age-related macular degeneration, pathologic myopia, and in CNV secondary to AS (3-5). While the long-term safety and efficacy of IVB use have yet to be ascertained, the short term results suggest that IVB may represent an advantageous approach in the management of these conditions. Herein we report our experience with intravitreal injections of bevacizumab in two pseudoxanthoma elasticum (PXE) patients with CNV secondary to AS, with 1 year of follow-up.

Case 1

We administered the first 1.25 mg IVB in the right eye (RE) of a 44-year-old man with AS who presented a subfoveal CNV with persistence of metamorphopsia and leakage on FA after a single PDT. Before the injection VA was 20/40 in the RE and 20/20 in the left eye (LE).
Fundus examination revealed peripapillary AS in both eyes and a grey subfoveal lesion with macular edema and hemorrhage in the RE. At fluorescein angiography (FA), the RE showed a subfoveal classic CNV with leakage and hypofluorescence due to the masking effect of blood. Furthermore, there was a hyperfluorescent area surrounding the neovascular lesion due to retinal pigment epithelium

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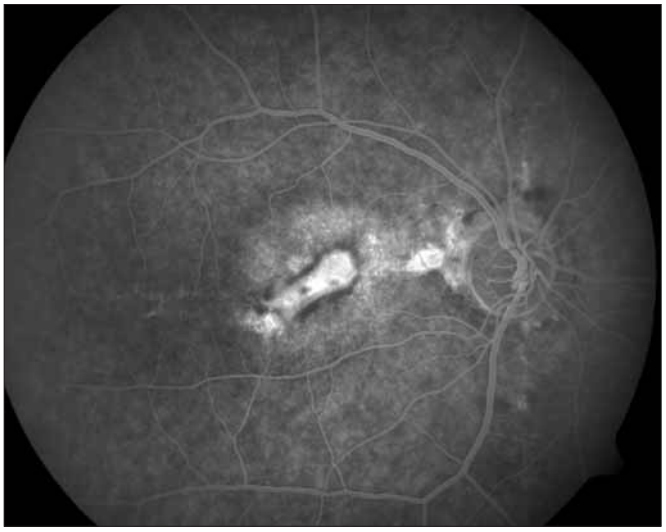

Fig. 1 - *Case 1 after 12 months. Late phases of fluorescein angiography: a wide hyperfluorescence due to the fluorescein staining is well evident in the foveal area. No signs of leakage are visible in the lesion.*

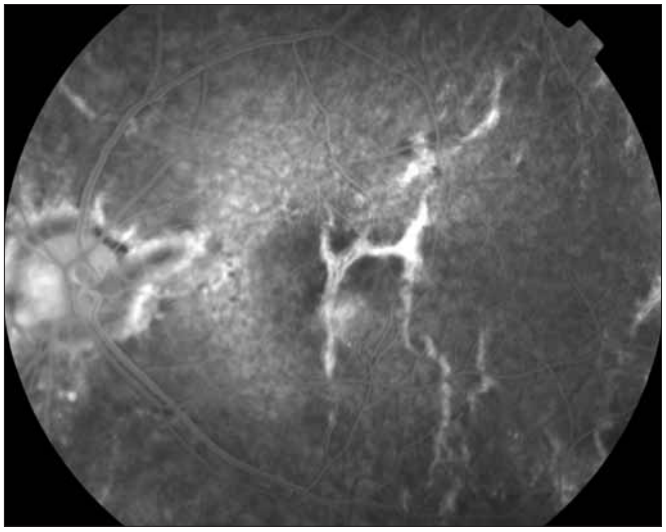

Fig. 2 - *Case 2 at baseline. Late phases of fluorescein angiography: hyperfluorescence due to leakage from the choroidal neovascularization is visible from the streak in the foveal area.*

(RPE) atrophy, which developed after the PDT treatments. OCT revealed increased retinal thickness and discontinuity of RPE.

One month after injection, the patient presented a VA of 20/50 with persistence of subretinal fluid on Optical Coherence Tomography (OCT) and leakage on FA. The second IVB was administered 6 weeks after the first. After 1 month, the patient showed a VA improvement (RE 20/30) and FA revealed no signs of CNV activity. OCT showed a reduction of retinal thickness but persistent intraretinal fluid. We administered a third IVB. After 1 month and for the rest of follow-up a complete absence of leakage from CNV was evident, as well as disappearance of intraretinal fluid on OCT (Fig. 1).

After 14 months of follow-up the patient still presented a VA of 20/30, a dry retina at OCT, and no leakage at FA.

Case 2

A 42-year-old man with AS in both eyes was referred to our outpatient clinic for metamorphopsia and VA loss in his LE for 1 week. VA was 20/20 in the LE and 20/400 in the RE.

At fundus examination, the RE showed a fibrotic subfoveal lesion and the LE revealed an active, never treated subfoveal lesion with edema developing on the border of a linear fibrotic scar, confirmed at FA and OCT (Fig 2). We administered 1.25 mg IVB. One month later, VA was still 20/20 with remission of metamorphopsia. Both FA and OCT demonstrated inactivity of the CNV and the absence of sub-intraretinal fluid. After 4 months, the patient complained of new metamorphopsia. VA was still 20/20 and FA showed leakage and blood from the CNV. OCT revealed an increase in macular thickness due to sub-intraretinal fluid. We administered a second IVB. One month after the second injection, the patient's VA decreased to

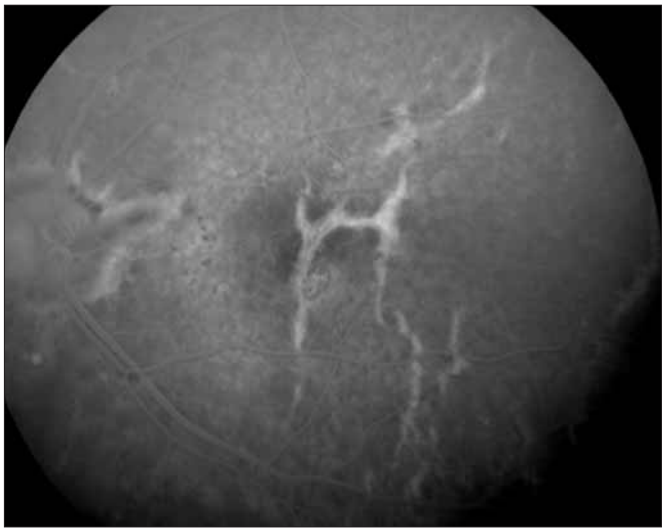

Fig. 3 - *Case 2 after 12 months. Late phases of fluorescein angiography: no leakage is visible from the choroidal neovascularization that still shows a moderate hyperfluorescence.*

20/25, with persistence of metamorphopsia and presence of blood on fundus examination. Therefore we performed a third IVB. One month later, metamorphopsia completely disappeared and VA was stable at 20/25. FA showed absence of leakage and blood and OCT detected a reduction in retinal thickness. After 13 months of follow-up, the patient presented stable VA at 20/25, a dry retina on OCT, no fluorescein leakage and complete re-absorption of the blood spots (Fig. 3).

DISCUSSION

Our case reports demonstrate long-term efficacy of intravitreal injections of bevacizumab in CNV secondary to AS in patients with PXE. Good short-term results have been reported in the literature regarding the use of IVB (3-5). The case series reported by Rinaldi et al included five patients followed for 3 to 9 months with a mean follow-up of six months (4). The authors referred an improvement in VA and a reduction of CNV leakage with no changes in CNV size. The largest case series reported in the literature, by Bhatnagar et al, included nine patients with a mean follow-up of 6 months and an average of 1.8 IVB (5). They obtained VA improvement or stabilization in all treated eyes. Thus, our 12-month follow-up period is the longest ever reported in the literature.

In our study, we performed three IVB in both patients in order to obtain CNV stabilization with complete absence of FA leakage and absence of macular edema at OCT. These changes in retinal morphology are likely the result of a combined antiexudative effect due to the decrease in vascular permeability and the antiproliferative action obtained by the inhibition of further CNV growth following VEGF blockage. These anatomic improvements were associated with concomitant increases in VA but the mechanisms behind these results remain uncertain. Moreover the cases showed good visual results probably because treatment was performed at an early stage of CNV development, which is consistent with results of other articles using intravitreal bevacizumab for CNV secondary to several causes.

CNV in patients with AS usually presents a high frequency of recurrences after PDT or TTT (2). It has been suggested that recurrences could be associated with release of VEGF occurring after these treatments. Thus, the use of an anti-VEGF drug that blocks all VEGF isoforms could reduce the frequency of recurrences.

In conclusion, our study shows the efficacy and safety of anti-VEGF therapy in eyes with CNV secondary to AS, even if the small sample size limits the value of the results. Although CNV in patients with AS is a relatively infrequent disease, a multicenter long-term study to evaluate the effects of intravitreal bevacizumab therapy could be useful.

The authors have no financial interest in any product mentioned in this article. This study was performed in accordance with the ethical standards laid down in the declaration of Helsinki in 1964.

Reprint requests to:
Domenico Schiano Lomoriello, MD
Fondazione G.B. Bietti-IRCCS
Via Livenza, 3
00198 Roma, Italy
dodoschiano@libero.it

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