

## Treatment of Choroidal Neovessels of High Myopia in a Young People by Intravitreal Injection of Bevacizumab: Case Report

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### ABSTRACT

**Introduction:** In young subjects, the major cause of Choroidal NeoVessels (CNV) during high myopia. The frequency of CVNs during high myopia varies from 5 to 10%.

**Observation:** We report a case of bilateral CNV in a young male subject, followed since childhood for high myopia. The patient received three intravitreal anti-VEGF injections of Bevacizumab at one month intervals. The evolution was favorable both anatomically and functionally.

**Discussion:** The advent of intravitreal injection (IVT) of anti-VEGF has improved the prognosis of CVN.

**Conclusion:** CVNs are frequent in severe myopia. Their treatment requires the use of IVT of anti-VEGF in first intention.

**Keywords:** High myopia; Choroidal neovessels; Bilateral; Anti-VEGF; Bamako

## INTRODUCTION

Severe myopia is the seventh most common cause of blindness worldwide. Severe myopia affects approximately 1% to 3% of the population depending on the study [1]. Choroidal neovascularization is a severe degenerative complication [1]. This complication affects subjects under 50 years of age [2]. It is estimated that 5%-10% of strong myopes will develop CNV [3]. The prognosis of CVNs in high myopia is dreadful because of the irreparable loss of vision in the absence of treatment. Of the existing therapeutic arsenal, several works have shown the primacy of anti-VEGF IVT [4]. The published work on the IVT of anti-VEGFs in the treatment of NVC of strong myope in Europe and Africa is disparate [4,5].

We report a case received in the emergency room of the IOTA-Teaching hospital. We will discuss the clinical and therapeutic specificities of strong myopic CVN.

## CASE STUDY

We received in the emergency department of the IOTA-Teaching hospital, Mr MD, aged 30 years, followed for strong myopia since childhood, for a photopsia, of brutal appearance in both

eyes since three days associated with the fall of visual acuity of distance of progressive aggravation. He had metamorphopsia for about a year, which was not investigated. On ophthalmological examination, the adnexa, oculomotricity and direct and consensual photo-motor reflexes were normal. In the right eye, the uncorrected distance visual acuity was reduced to even hand movement. The anterior segment was normal; the ocular tone was at 13 mmHg. On the fundus, there was a myopic staphyloma, a perifoveolar fibrovascular atrophy, a 360 degree flat retina, and in the OG, the uncorrected distance visual acuity was limited to light perception. The anterior segment was normal, the ocular tone was 11 mmHg. On the fundus, there was a myopic staphyloma, a retrofoveal fibrovascular atrophy with a flat retina on 360 degrees. Faced with these aspects of the fundus, we concluded that the strong myope had bilateral choroidal neovessels. Fluorescein angiography of both eyes showed early and localized areas of hyperfluorescence, increasing in a crescendo fashion and leading to a wide diffusion of the dye at late times.

Optical Coherence Tomography (OCT) showed in both eyes, the presence of a perifoveolar spindle-shaped hyperreflexia in front of the plane of the Bruch's membrane-pigment epithelium in

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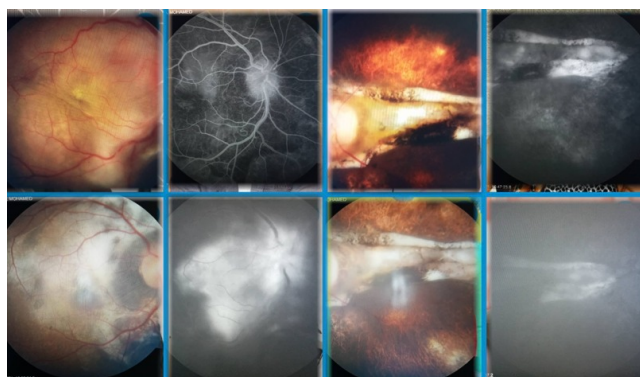
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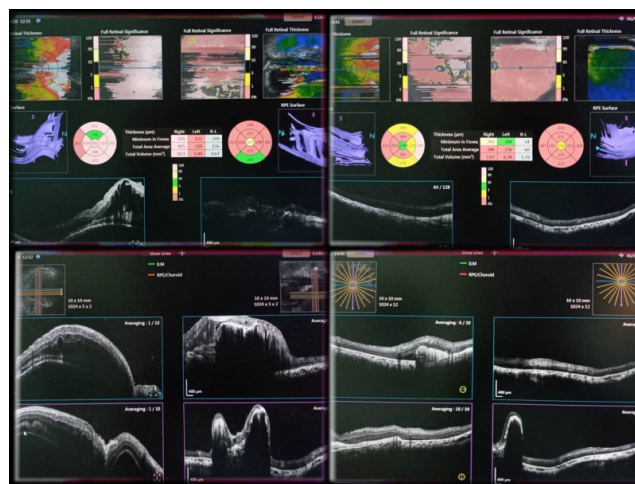
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connection with visible pre-epithelial choroidal neovessels (type II) with associated retinal serous detachment and logettes.

The patient received three intravitreal injections of Bevacizumab Anti-VEGF with a one month interval and rigorous clinical and paraclinical follow-up (distance visual acuity, fundus examination and OCT). After three months of follow-up, the evolution was favorable on the anatomical and functional levels, marked by the limitation of the distance visual acuity without correction to counting the fingers at five meters in the right eye and even moving the hand in the left eye. The visual acuity with correction, measured with the Snellen scale, was 2/10 in the right eye and limited to counting fingers at one meter in the left eye. The myopia value was -6.50 D in the right eye and -8.25 D in the left eye. On the control OCT images, the perifoveolar fusiform hyperreflexia disappeared almost completely in both eyes, without exudative phenomena or logettes on the right. In view of this improvement, the patient was placed under monthly surveillance (Figures 1 and 2).



**Figure 1:** A) Right eye fundus, before IVTs, showing macular atrophy. B) Early time AGF of the right eye, before IVT, showing early juxta foveolar hyperfluorescence related to NVC. C) Right eye fundus, after IVT, showing large areas of macular and peri-papillary atrophy. D) Early AGF image, after IVT, showing large areas of early juxta foveolar and peri-papillary hyperfluorescence related to fibrovascular atrophy. E) Left fundus, before IVT, showing myopic choroidosis and juxta foveolar and peri-papillary fibrovascular atrophy. F) Early time AGF image of the left eye, before IVT, showing early juxta foveolar hyperfluorescence related to juxta foveolar fibrovascular atrophy. G) Left fundus, after IVT, showing myopic choroidosis and large areas of macular and peri-papillary atrophy. H) Early time AGF image of the left eye, after IVT, showing early juxta foveolar hyperfluorescence related to juxta foveolar fibrovascular atrophy.



**Figure 2:** (A,B) OCT images, before IVT, showing in the right eye a line of hyperreflexivity between the pigment epithelium and neuroretina in relation to type II CNVs associated with retinal serous detachment (RSD) pits and in the left eye type II CNVs, macular atrophy and RSD pits. (C,D): OCT images, after IVT, showing regression of type II CNVs and DSR pits.

## DISCUSSION

The symptoms of choroidal neovascularization in the strong myope are identical to those of any macular damage. They are metamorphopsia, decreased visual acuity, especially at near, and relative scotoma [6]. Decreased visual acuity, photopsia and metamorphopsia were the complaints of our patient. The visual handicap generated by this condition is all the more severe as the damage is bilateral in about 30% of cases [7]. In our case, the damage was bilateral.

The positive diagnosis of CVN is based on a combination of clinical and paraclinical findings [8,9]. The ophthalmoscopic appearance of CVNs is that of a lesion that is often grayish in color, surrounded by a more pigmented border. Retinal hemorrhages and exudates may be present. Fluorescein angiography and optical coherence tomography are necessary for the diagnosis; they highlight the vascular lacerations of juxta or extra-foveolar disposition. Our patient's AGF images showed the CVNs as early, localized hyperfluorescence, increasing rapidly throughout the angiographic sequence, and culminating in broad diffusion of dye at late times. Likewise, the aspects of his OCT images, before IVT with anti-VEGF, were in accordance with the literature.

A severe degenerative complication of severe myopia, CVNs must be treated rapidly [10]. Indeed, the spontaneous evolution of CVNs in high myopia is unfavorable, by the constitution of a pigmented fibrovascular scar replacing the choriocapillaris and the outer layers of the retina [10].

In addition, several works have highlighted the efficacy of anti-VEGF IVTs, used as first-line therapy, in the management of NVC [11,12].

Elsewhere, to the primacy of anti-VEGF IVTs over other therapeutic modalities (Argon laser photo coagulation, photodynamic therapy), the France Macula Federation (FFM)

recommended in 2014: "the performance of a single IVT followed by on-demand retreatments (PRN), based on signs of disease activity. However, in the face of highly exudative and/or large neovessels, an induction phase of 3 IVTs followed by a PRN protocol, could be a reasonable alternative" [13]. The risk of recurrence of CVNs in strong myopes treated with antiVEGF is low. This recurrence occurs in the presence of certain predisposing factors: large size of the neovessel, thin choroid, delay in the initiation of treatment. We obtained a good clinical and paraclinical evolution after three IVT of Bevacizumab. And after six months of clinical (distance visual acuity and fundus) and paraclinical (AGF and OCT) monitoring we had not noted any recurrence.

## CONCLUSION

Intravitreal injections of anti-VEGFs have revolutionized the prognosis of CVN, a serious and potentially blinding complication of severe myopia. Anti-VEGF IVTs have become the first-line treatment for CVN in high myopia today. Scientific work is needed to optimize the use of anti-VEGF IVT in high myopia NVC.

## CONFLICT OF INTEREST

The authors declare no conflict of interest regarding this article.

## ETHICAL CONSIDERATION

The study received approval from the hospital ethics committee. The patient's consent was obtained in the context of publications with a strictly scientific purpose.

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