American Journal of Ophthalmology Case Reports 15 (2019) 100460

Contents lists available at ScienceDirect

American Journal of Ophthalmology Case Reports

journal homepage: www.elsevier.com/locate/ajoc

Case report

Is subretinal surgery feasible for a non-responsive juxtafoveal type 2 choroidal neovascular membrane?

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ARTICLE INFO

Keywords:
Choroidal neovascular membrane
Spectral-domain optical coherence tomography
Pars plana vitrectomy
Anti-VEGF therapy

ABSTRACT

Purpose: To describe the long-term outcome of a patient with multifocal choroiditis, who underwent surgical removal of a type 2 choroidal neovascular membrane employing 23 G pars plana vitrectomy.
Observations: A 50-year-old man was treated with 3 monthly intravitreal bevacizumab injections, but despite treatment, visual acuity continued to worsen from 20/40 to 20/100, and bleeding was not receding. A minimal invasive pars plana vitrectomy was performed for surgical removal of the neovascular complex without any complicating incident. Subsequent visual acuity was 20/25 for more than eleven years.
Conclusions and Importance: Surgical removal of choroidal neovascular membranes employing minimal invasive surgery in addition to anti-VEGF therapy, and OCT evaluation can be a viable approach for selected cases of juxtafoveal type 2 CNV.

1. Introduction

Choroidal neovascularization remains a major source of visual loss in patients. Although most commonly found in patients with age-related macular degeneration (AMD), it is also found in high myopia, angioid streaks, trauma, and other diseases.[1]

Choroidal neovascularization (CNV) is classified based on location relative to the retinal pigment epithelium (RPE) layer. CNV type 1 are confined under the RPE and type 2 in the subretinal space between RPE and retina, which may allow a better approach for surgical removal.[2]

Previous studies by Bressler[3,4] and the Submacular Surgery Trials Research Group, described fluorescein angiography as the primary imaging modality to detect a CNV, which, although useful for determining activity, does not provide a three-dimensional anatomic information about retinal layers and the RPE. The development of three-dimensional imaging with optical coherence tomography has revolutionized the examination of retinal disease. At present 3D imaging with OCT has considerable clinical potential in surgical planning and evaluation of surgical outcomes.[5] There are no reported use of OCT imaging for subretinal surgery, nor anti-VEGF as adjuvant therapy for sub-retinal surgery, employing small gauge surgery (25 G) for CNV extraction.

The following case exemplifies the surgical removal of a type 2 submacular CNV in a 51-year-old patient with multifocal choroiditis who did not respond to multiple bevacizumab (IVB) injections.

2. Case report

A 51-year-old male patient with a history of multifocal choroiditis presented with decrease visual acuity of the right eye due to a choroidal neovascular membrane (Fig. 1A and B).

He was treated with 3 monthly IVB injections but despite treatment, visual acuity continued to worsen from 20/40 to 20/100, and bleeding persisted. Since the CNV was juxtafoveal, thermal laser was not considered to be an option. A bold approach was decided upon, and the patient underwent 23-gauge pars plana vitrectomy. Separation of the posterior hyaloid was achieved, and we used an Atkinson retrobulbar needle to perform a retinotomy parallel to the nerve fiber layer. 23-gauge internal limiting membrane (ILM) forceps were used to grasp and remove the CNV and a bubble of perfluorocarbon liquid (PFCL) was injected to flatten the retina and displace the remnant subretinal blood. Finally, air-fluid exchange was performed, vitreous cavity was left with air tamponade.

Visual acuity improved to 20/60 in the first week after surgery and

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https://doi.org/10.1016/j.ajoc.2019.100460
Received 11 May 2018; Received in revised form 8 April 2019; Accepted 3 May 2019
Available online 10 May 2019

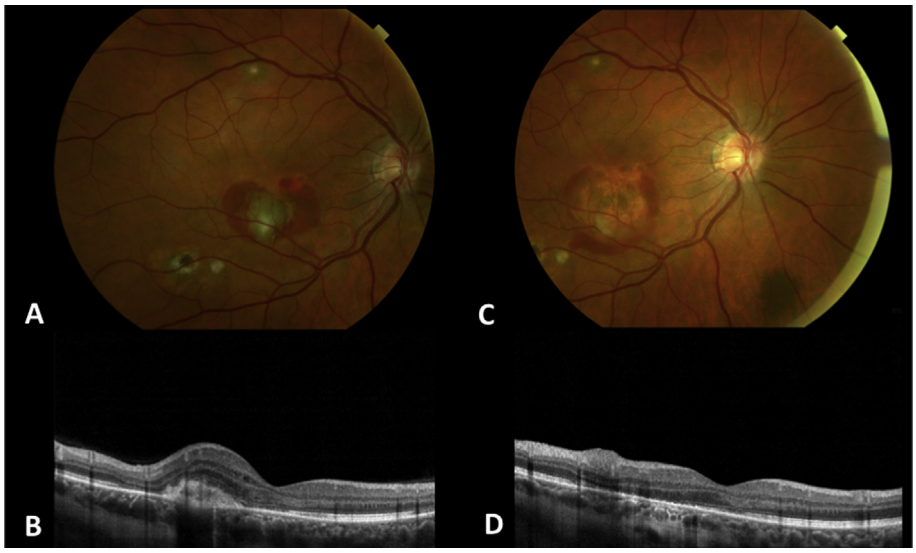

Fig. 1. A) Pre-surgical color fundus photography. Neovascular complex near the temporal inferior arcade with non-clearing associated sub retinal hemorrhage. 20/100 visual acuity. **B)** Pre-surgical OCT section of the choroidal neovascular membrane. **C)** 1-week post-op color fundus photography. Evidence of sub-retinal hemorrhage, absence of the lesion. 20/60 visual acuity. **D).** One-week post-op OCT sections of the macula. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

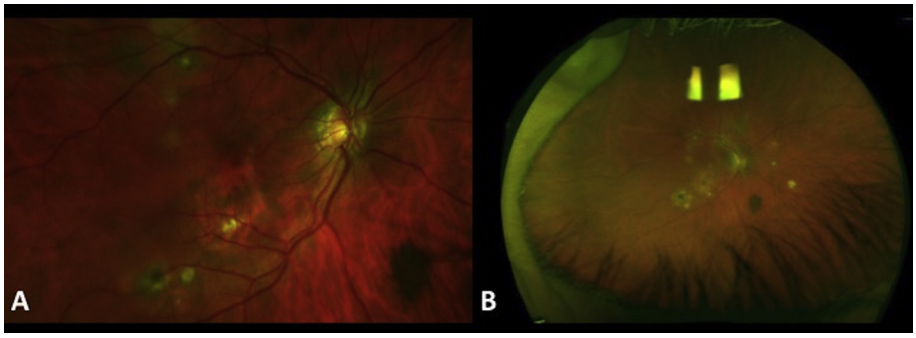

Fig. 2. A) 6-month post-op color fundus photography. A visible zone of retinal pigment epithelium atrophy is seen where the lesion was. Best corrected visual acuity of 20/25. **B)** Wide field fundus color photograph at six-years follow-up showing absence of CNV activity. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

three weeks later the patient was injected with IVB because a small area of sub-retinal fluid (SRF) was identified on OCT (Fig. 1B and C). At the six-month follow-up visit there was no evidence of SRF in OCT and best-corrected visual acuity (BCVA) was 20/25 (see Fig. 2A). 20/20 BCVA was achieved at 6-year follow-up. Additional IVB was needed 3 times three years after surgery and vision remained stable with 20/30 BCVA until his last visit with absence of sub-retinal fluid. Fig. 2B depicts a wide field fundus color photograph at six-years follow-up showing absence of CNV activity. OCT at the 6-year follow-up showed an epiretinal membrane with new focal pigment epithelium detachment.

3. Discussion

The surgical approach for subfoveal CNV is not the first line of treatment since the introduction of the anti-VEGF agents, considered at this time the gold standard therapy. Currently, ranibizumab, bevacizumab and aflibercept have been described as effective therapeutic agents for subfoveal CNV from different etiologies.[6] In addition, adjunctive photodynamic therapy has demonstrated promising results for eyes with Type 1 neovascularization and thickened choroid.[5–7]

However, recently reported data indicate that an average of 5% of patients can be both functionally and anatomically non-respondent to intravitreal anti-vascular endothelial growth factor monotherapy injections.[8] However, in this case, the juxtafoveal CNV related to multifocal choroiditis was not responsive to multiple treatments with intravitreal ranibizumab, and the visual acuity was declining. For these selected cases, surgical excision of subfoveal choroidal neovascularization may stabilize or improve visual acuity. Moreover, it has been reported that patients with focal disorders of the retinal pigment epithelium Bruch's membrane complex appear to have a better surgical outcome than those with diffuse disease.[9] This case demonstrate that a juxtafoveal type 2 CNV, non-respondent to anti-VEGF therapy, can be successfully treated with subretinal surgery for selected cases.

4. Conclusions

Surgical removal of choroidal neovascular membranes can be a useful measure for anti-VEGF therapy refractory patients, selecting for type 2 CNV cases, and utilizing OCT assessment and minimally invasive vitrectomy surgery.

Patient consent

Consent to publish the case report was not obtained. This report does not contain any personal information that could lead to the identification of the patient.

Written informed consent was obtained from patients for publication of these case reports and any accompanying images.

Acknowledgments and disclosures

Conflict of interest

All authors have no financial disclosures related to this manuscript.

Authorship

The authors attest that they meet the current ICMJE criteria for Authorship.

Acknowledgements

None.

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