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Case Report

A COMPREHENSIVE CASE STUDY AND LITERATURE ANALYSIS ON THE EFFICACY OF ANTI-VEGF MEDICATION IN TREATING BRANCH RETINAL VEIN OCCLUSION

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ABSTRACT

Purpose: The goal of this case study and literature review is to assess whether anti-vascular endothelial growth factor (anti-VEGF) medication is effective in coping with branch retinal vein occlusion (BRVO). We present an in-depth examination of the patient's medical records, diagnostic accomplishments and therapy results utilizing data from a 61-year-old male patient.

Methods: A case report with a brief literature review, which gives readers a better understanding of the current state of BRVO therapeutic choices, using data gathered from the Google Scholar and PubMed databases.

Results: A 61-year-old male with blurred vision in the upper half of the visual field in his left eye, BCVA OD: 20/20; OS: 20/70, presented to an outpatient clinic in Stara Zagora, Bulgaria. The symptoms started three weeks ago. The patient reported a history of hypertension and hyperlipidemia. He denied any ocular diseases in his family. After an ophthalmology exam, he was recommended anti-VEGF therapy and antihypertensive and lipid lowering medications intake.

Conclusion: Coping with BRVO as ophthalmologists is very important for us, because RVO is one of the most common eye diseases. Intravitreal therapy has revolutionized the treatment of retinal vascular diseases, including BRVO. Although these intravitreal agents are effective, our understanding of their specific indications and long -term roles is still evolving. Furthermore, until the underlying occlusive pathophysiology of RVO, our treatments will be limited to temporizing therapies against a chronic disease.

Key words: retinal vein occlusion, branch occlusion, vision loss, treatment, anti-VEGF, corticosteroids

INTRODUCTION

Retinal vein occlusion is a common cause of vision loss, being the second most common vascular disease after diabetic retinopathy. Depending on their location, the occlusions of the retinal vein can be branched (BRVO), hemiretinal (HRVO) or central retinal (CRVO). Vision loss, caused by retinal vein occlusion is secondary to macular edema, with a risk of developing neovascular glaucoma. Applying intravitreal anti-vascular endothelial growth factor(anti-VEGF), agents has shown to be highly effective as a pharmacological therapy. Several factors can contribute to the development of BRVO, including hypertension, diabetes and other vascular diseases. Aging is also a significant risk factor, as changes have to be seen in the blood vessels over time. Understanding the risk factors is crucial for both- prevention and early intervention. This literature review will have numerous articles and journal analysis that will relate to the main topic.

The size of the BRVO area and its location vary from the total hemiretina, to a small place along the small venule. If macular drainage isn't involved and the edema doesn't reach the macula, patients' visual acuity may be normal. In some cases, intraocular corticosteroid implants or corticosteroids, applied intravitreal may be considered for the treatment of macular

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edema, associated with BRVO. These treatments help to reduce inflammation and fluid accumulation in the macula. Corticosteroids, including Dexamethasone(Dex), Flucinolone acetonide(FA), and Triamcinolone acetonide(TA), are an alternative treatment for macular edema in BRVO (16). However, corticosteroids can cause lens clouding and increased intraocular pressure. Regarding a second-line treatment for BRVO-associated macular edema, corticosteroids present a difficult alternative.

In a study released in 2022, authors stressed how important it was to see a central macular depth reduction rate of 37% after two weeks to know that anti-VEGF treatment would work in the long run for macular edema, caused by RVO (2, 3, 17). They examined the characteristics such as age, gender, subtype of the disease and duration, BCVA, intraocular pressure and thickness of the macula in its central part.

Other studies looked at how Dexamethasone implants and anti-VEGF therapy were used to treat macular edema in RVO (6, 8-11, 13, 16). These studies give important information about how well different treatment options work in real hospital settings. When the effect of the intravitreal injection disappears, a rebound effect has to be seen, which is characterized by a recurrence of macular edema more than the baseline value. Anti-VEGF treatment option also leads pathophysiologically to endothelial cell proliferation, which plays a key role in the organization and recanalization of the thrombus. In a combination with grid-laser, in some cases, the treatment gives good outcomes. In other cases, when anti-VEGF therapy doesn't work, corticosteroids can be used as a treatment choice.

Other authors use data from the European Vitreo Retinal Society's macular edema study to talk about how to treat macular edema with a retinal vein occlusion (1). Medical professionals can use the study to make better plans for how to treat this illness.

The evolution of macular edema therapy as time passed, reveals the employment of a wide range of therapeutic techniques, all of which have their own set of advantages and disadvantages. Whereas these therapies have proven to be helpful in providing positive, visible outcomes, side effects have been a serious worry. Laser therapy was once an exciting option, but it has gone out of favour in some cases, because of its limitations. A bigger picture of the long-term effects of macular edema is given by another study (7).

CASE REPORT

A 61-year-old male patient was admitted to the outpatient clinic in Stara Zagora with a complaint of blurred vision in the upper half of his visual field on the left eye. The ophthalmology exam showed BCVA OD 20/20, OS 20/70. After pupillary dilation, occlusion of the vasculature in the upper temporal quadrant and lack of foveolar reflex was found. Optical coherence tomography was performed, showing decreased reflectivity around the macula and increased retinal thickness in all quadrants (4) **(Figure 1).** A patient informed about hypertension and hyperlipidemia. He denied any ocular disease in his family.

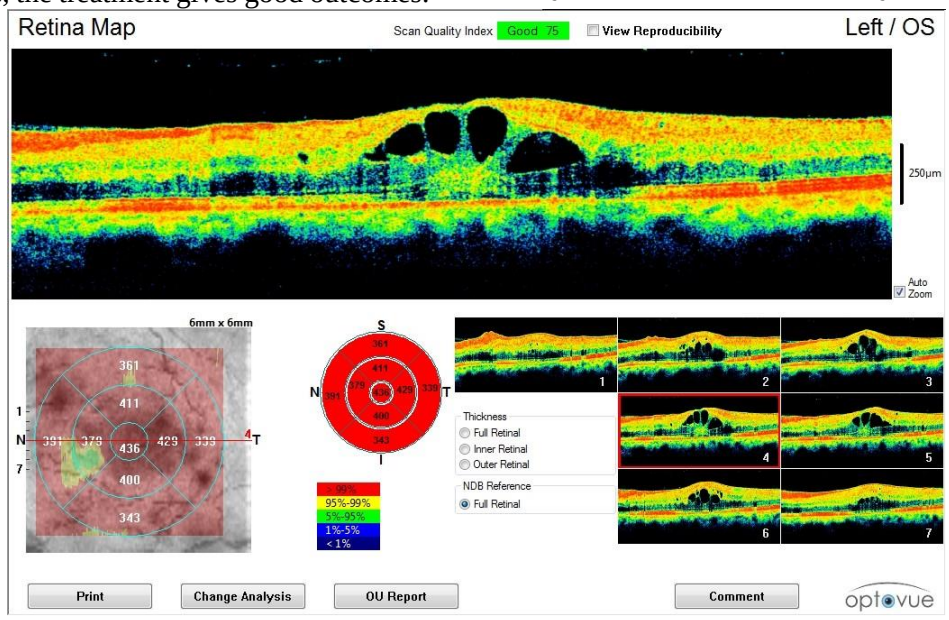

Figure 1. OCT image at the patient's first examination with a central retinal thickness of 436µm

His paraclinic results showed: Hgb 160 g/l, Rbc 5,33, WBC 10,25, Plt-100, Glucose 4,7mmol/l; CRP- 13mg/l, LDH 512 U/I. Following paraclinical confirmation of the diagnosis, the patient got a triple regimen of Eylea (2 mg /0.05ml every 4 weeks) (12). In **Figure 2 and Figure 3** are OCTs, which show the results after the second procedure (macular thickness of 256μm), and the third procedure (macular thickness of 250μm).

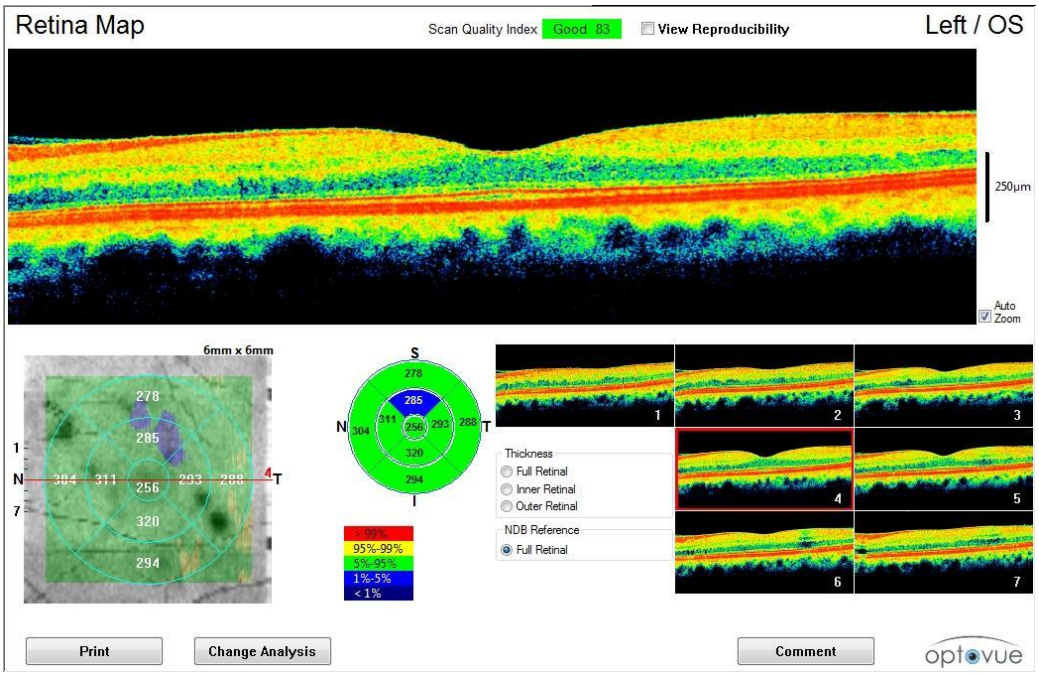

Figure 2. OCT image after a second examination of the patient with a macular thickness of 256μm

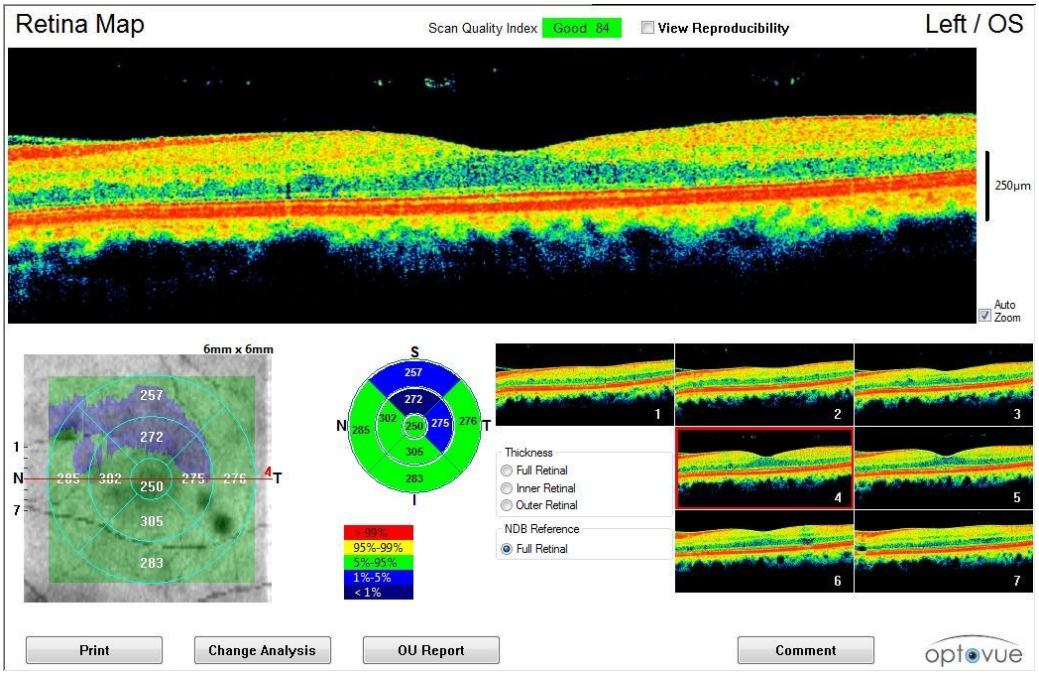

Figure 3. OCT image after the third examination of the patient with a macular thickness of 250μm

A lot of progress has been made in treating macular edema caused by retinal vein occlusion (RVO). There are now a number of useful methods available. This review of the literature gets into new studies and gives a full rundown of the treatments that are available and how well they work based on an information from trustworthy sources.

Intravitreal injections have their short- and long-term effects (14). Anti-VEGF drugs have been shown to improve the eyesight of people with BRVO.

Some authors compare how well intravitreal ranibizumab works with and without selective retinal treatment for treating macular edema caused by branch retinal vein occlusion (BRVO) (15) . By looking into alternative approaches, this work adds to what we know about treatments other than anti-VEGF drugs. The study's results help us learn more about the pros and cons of using intravitreal Ranibizumab along with selective retinal treatment. This can help us deal with the macular swelling caused by BRVO. It also gives useful details about the current state and limits of laser-based treatments in this setting, thereby providing an invaluable tool to incorporate laser therapy into the current BRVO management setting.

Another author did a full study on the outcomes of stopping anti-VEGF medication treatment in people with retinal vein occlusion (RVO) (5). Because it looks at real-life scenarios and explains how to treat those who have branch retinal vein occlusion (BRVO), the study is especially important. To make sure that medical practices follow the rules set by reputable groups such as the American Academy of Ophthalmology (AAO), it is necessary to look into the patterns of people stopping anti-VEGF drugs, which have become an important part of treating BRVO.

The study looks into the reasons and patterns for stopping anti-VEGF medications. This gives us important new information about the challenges and things that need to be thought about when caring for BRVO over the long term. This study is helpful because it bridges the gap between what theories say should be done and how things are done in real life, which is always changing.

CONCLUSION

In conclusion, branch retinal vein occlusion is a major problem for ophthalmologists that demands careful evaluation of all available treatment possibilities. Anti-VEGF medication has been shown to be effective in curing the macular edema caused by BRVO. Additional research is needed to better understand the lasting function and specific indications of intravitreal medicines in the treatment of this medical condition.

Abbreviations

BRVO = branch retinal vein occlusion, RVO = retinal vein occlusion, VEGF = vessel endothelial growth factor, BCVA = best corrected visual acuity, OD = oculi dextri, OS = oculi sinistri, anti-VEGF = anti- vessel endothelial growth factor, Dex = Dexamethasone, FA = Flucinolone acetonide, TA=Triamcinolone acetonide.

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