https://doi.org/10.3329/cbmj.v14i2.83323

Clinical Outcome with Intravitreal Brolucizumab for Retinal Vein Occlusion

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Abstract

This case study tends to report that to what extent a patient with retinal vein occlusion positively responding to intravitreal injection of Brolucizumab. In this case, Brolucizumab was recommended for a 60-year-old female who primarily presented with signs of visual loss. The best corrected visual acuity recorded as CF at 3 ft (ability to count fingers at 3 feet) in her right eye and 6/12 of the left eye. The Intraocular pressure (IOP) was 18 mmHg (right) and 24 mmHg (left). The Central corneal thickness (CCT) was 530 µm (both eyes). Lental opacity was observed in both eyes. The patient achieved significant visual improvement after a one-year follow-up with brolucizumab. There were no serious adverse effects. With appropriate monitoring, brolucizumab appears to be safe and beneficial for patients with retinal vein occlusion.

CBMJ 2025 July: vol. 14 no. 02 P:198-200

Keywords: Brolucizumab, retinal vein occlusion, macular oedema, anti-VEGF agent, intravitreal injection

Introduction

Retinal vascular occlusions are the most common pattern of retinal vascular disease, second to diabetic retinopathy.[1] There are two major anatomic forms of retinal vascular occlusion: branch retinal vein occlusion (BRVO) and central retinal vein occlusion (CRVO).[2] A thrombus in the central retinal vein is the typical source to develop CRVO.[3] Adults are mostly affected by central retinal vein occlusion (CRVO), and it is a crippling and catastrophic disease process. It is the second most common retinal vascular disorder following diabetic retinopathy.[1] It is believed that venous occlusion causes an ischemic and hypoxic state, resulting in visually noticeable sequelae such as macular oedema and neovascularization of the anterior segment and retina, even if the precise etiology is unclear. In elderly people, Age-related macular degeneration (ARMD) is the leading cause of blindness in the developed world. It is projected to increasing, it is with estimated 288 million by 2040.[4] Since its accessibility in October 2019, brolucizumab has been used to treat CRVO-associated macular oedema. Clinical trials have reported its effectiveness in improving vision and reducing macular oedema.[5] This case study tends to show its effectiveness in treating patients with retinal vein occlusion and macular oedema.

Case Presentation

In the beginning of 2023, a 60-year-old female reported with a history of severely reduced vision in both eyes and a massive central retinal vein occlusion with macular oedema in her right eye while visiting Bangladesh Eye Hospital and Institute, Dhaka, Bangladesh. The best corrected visual acuity recorded as CF at 3 ft (ability to count fingers at 3 feet) in her right eye and 6/12 of the left eye. The Intraocular pressure (IOP) was 18 mmHg (right) and 24 mmHg (left). The Central corneal thickness (CCT) was 530 µm (both eyes). Lental opacity was observed in both eyes.

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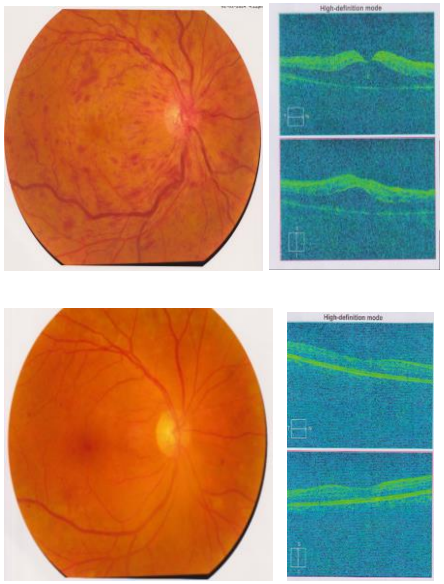

Fig 1: Color fundus and OCT macula a) before administration of brolucizumab; b) after administration of brolucizumab.

The patient was initiated on a monthly intravitreal injection of brolucizumab in the right eye. At 4 months post-injection, the right eye's visual acuity improved to 6/18. The visual acuity becomes better with every follow-up. The patient's visual acuity improved to 6/9 in the left eye and 6/60 in the right after a month of follow-up. Every 4-12 weeks, the right eye receives an intravitreal dose of brolucizumab. After more than one year of follow-up with brolucizumab post-injection, BCVA in the right eye was 6/12. In both eyes, the CCT (Central corneal thickness) was reduced to 519 micrometers (µm). According to the fundus examination, CRVO resolved macular oedema from the pre-brolucizumab baseline. The changes observed in the colour fundus and OCT macula (between before and after intravitreal brolucizumab treatment) are shown in Fig: 1). After receiving a brolucizumab injection, the patient's eyesight has improved by 6/12 in the right eye and 6/6 in the left.

Discussion

This case demonstrates the potential effectiveness of brolucizumab in treating macular edema with retinal vein occlusion (RVO). The patient had severe visual impairment in both eyes. The patient's right eye showed significant improvement after the intervention. The right eye's best-corrected visual acuity (BCVA) improved significantly during the treatment. After a year, it went from CF at 3 feet to 6/12. A fundus examination reveals a decrease in central corneal thickness (CCT), indicating the therapeutic efficacy of brolucizumab.

CRVO is common retinal vascular disorder after diabetic retinopathy and causing a significant visual morbidity, particularly in older adults.[1] CRVO, a major cause of vision loss, is commonly treated with anti-VEGF drugs such as ranibizumab and aflibercept. However, Brolucizumab, a humanized single-chain antibody fragment, offers advantages, including prolonged dosing intervals and potent anti-VEGF activity.[6]

The humanized single-chain antibody fragment brolucizumab was first approved in 2019, with matching prolonged dose intervals, and has demonstrated potent anti-VEGF activity. Clinical trials, such as the HAWK and HARRIER studies, have demonstrated its efficacy in treating neovascular age-related macular degeneration (AMD)[7] and its potential applicability to other retinal vascular diseases, including CRVO.[5]

Ischemia, hypoxia, macular oedema, and other neovascular issues are caused by the formation of a thrombus in the central retinal vein. Anti-VEGF agents, such as ranibizumab and aflibercept, have historically been the mainstay of treatment, with

significant efficacy in improving both visual and anatomical outcomes.[8]

Sometimes, continual administration of brolucizumab is troublesome because of its long-term monitoring and poor patient adherence to treatment. Additionally, it is somewhat expensive. However, we offered our patient a discount and conducted proper counselling. Therefore, the patient followed up appropriately and completed the dosage. While Brolucizumab has been associated with rare adverse events, such as intraocular inflammation and retinal vasculitis,[9] in this particular case, no such problems developed.

This case highlights the effectiveness of brolucizumab, but it's also important to consider the drug's safety record. Although uncommon, intraocular inflammation and retinal vasculitis have been documented as side effects.[4] However, the risks can be mitigated with judicious patient selection and monitoring. Importantly, no adverse effects were observed in this case.

Conclusion

This case report contributes to the growing body of evidence demonstrating that brolucizumab is a safe and effective treatment for macular oedema associated with retinal vein occlusion (RVO). Although adverse effects are uncommon, careful patient selection and attentive observation are essential. This example contributes to the growing body of data demonstrating the effectiveness of brolucizumab in treating retinal vascular diseases.

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