



BRANCH RETINAL VEIN OCCLUSION: INSIGHTS INTO PATHOGENESIS, DIAGNOSIS, AND THERAPEUTIC APPROACHES

Ophthalmology

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ABSTRACT

Background: Branch Retinal Vein Occlusion (BRVO) represents one of the most common retinal vascular disorders that can lead to visual impairment, especially among older adults. It typically occurs due to a blockage in a retinal vein, resulting in complications such as macular edema, haemorrhages, and ischemia. Hypertension, diabetes mellitus, and lipid abnormalities are among the key contributing systemic risk factors. **Objective:** This study aims to provide a detailed overview of the underlying mechanisms, diagnostic approaches, and current treatment options for BRVO with the goal of enhancing visual outcomes in affected patients. **Methods:** This retrospective study analysed clinical data from 30 adult patients diagnosed with BRVO between January and September 2024. The evaluation included demographic information, risk factors, clinical features, and response to treatment. **Results:** Among the 30 patients assessed, the mean age was 40 years with a higher prevalence among males. Systemic risk factors included hypertension (40%), dyslipidaemia (30%), diabetes (20%), and smoking (10%). Most patients (80%) presented with sudden unilateral vision loss, while the remaining reported blurred vision. Optical coherence tomography (OCT) was pivotal in identifying characteristic retinal abnormalities. Treatment primarily involved intravitreal anti-VEGF injections, laser therapy, and management of systemic risk factors. Visual acuity significantly improved in most patients post-treatment, with 60% achieving acuity between 6/9 and 6/36, and the remaining 40% between 6/60 and 3/60. **Conclusion:** BRVO poses a substantial threat to vision but can be effectively managed with timely diagnosis and appropriate therapy, particularly anti-VEGF agents. This underscores the need for continuous follow-up and personalized management strategies to prevent further visual deterioration.

KEYWORDS

Macular edema, Ischemia, Visual impairment, Anti-VEGF therapy, Optical coherence tomography (OCT)

INTRODUCTION

Branch Retinal Vein Occlusion (BRVO) is a frequent cause of vision problems in middle-aged and older individuals. The condition results from blockage in one of the retinal vein branches, most often at arteriovenous crossing points where arterial compression can lead to thrombosis. Contributing factors include systemic diseases such as hypertension, diabetes, and elevated cholesterol. Clinical manifestations range from painless sudden visual loss to varying degrees of visual distortion. BRVO is classified as either ischemic or non-ischemic, with the former often linked to more severe outcomes. This study investigates the pathophysiological basis, clinical features, and current treatment modalities to reduce the impact of BRVO on vision.

MATERIALS AND METHODS

Retrospective analysis of all BRVO patients presenting to the ophthalmology department and casualty from January 2024 to september 2024 was done. A total of 30 patients were included.

Inclusion Criteria:

Patients aged 18 years and above
Patients with risk factors of hypertension, hyperlipidemia, diabetes.

Exclusion Criteria:

Previous retinal surgery
Presence of significant ocular disease like diabetic retinopathy, retinal detachment.
History of recent ocular trauma.

- All patients underwent the following evaluations:
- Visual acuity testing
- Slit-lamp examination for anterior and posterior segment assessment
- Fundus examination to detect hemorrhages, edema, and cotton wool spots
- OCT imaging to assess macular thickness and detect edema.

RESULTS

A total of 30 patients aged years and above were included in the study, with a mean age of 40 years. The presenting symptoms varied among the participants, with the majority (80%) reporting sudden vision loss in one eye, which was the most common presenting complaint. The

remaining 20% experienced blurred vision, which was also unilateral. The mean duration of symptoms before presentation was 2 weeks, with a range from a few days to 4 weeks. Risk factors for BRVO were carefully documented. Hypertension was the most common systemic condition, affecting 40% of the patients, followed by hyperlipidemia in 30% cases

Table 1: Risk factors for BRVO

Risk factors	No of patients
Hypertension	12
Dyslipidemia	9
Diabetes	6
Idiopathic	3

And diabetes in 20%. Additionally, 10% of patients had other risk factors such as smoking and a family history of vascular disease. These findings are consistent with known associations between BRVO and systemic vascular conditions, particularly hypertension and diabetes. At the time of presentation, visual acuity was assessed for all patients using the Snellen chart. A significant proportion of patients (60%) presented with visual acuity of 3/60 or worse, indicating substantial visual impairment. The remaining 40% had better visual acuity, ranging from 6/24 to 6/60. These findings underscore the severe visual compromise commonly associated with BRVO, particularly when macular edema or retinal ischemia is present.

Table 2: Visual acuity at presentation

Number of patients	Visual acuity
18	≤3/60
12	6/24-6/60

Table 3: Visual acuity after Anti VEGF

Number of patients	Visual acuity
18	6/9-6/36
12	6/60-3/60

Fundus examination was performed to assess the extent of retinal involvement. Retinal hemorrhages were observed in 80% of patients, indicating that this is a prevalent feature of BRVO. optical coherence tomography (OCT) was utilized to assess macular edema, a common complication of BRVO. OCT revealed that 65% of patients exhibited signs of macular edema at baseline. This finding highlights the importance of OCT in evaluating retinal thickness and macular

changes associated with visual impairment.



Figure 1: showing multiple superficial and deep haemorrhages present in the supero-temporal arcade involving the macula.

DISCUSSION

This study illustrates the visual impact of BRVO among young adults, especially in the presence of systemic risk factors. Intravitreal anti-VEGF injections proved to be highly effective in improving visual acuity and reducing macular edema. The therapy functions by inhibiting vascular endothelial growth factor, thus reducing vascular leakage and abnormal vessel proliferation. The consistent improvement in post-treatment vision highlights the importance of early and targeted intervention.

Ongoing monitoring is critical, as complications like recurrent hemorrhages or persistent edema may occur. Managing systemic conditions in parallel is essential for long-term visual stability.

CONCLUSION

BRVO remains a notable cause of vision loss in adults, especially those with comorbidities such as hypertension and diabetes. This study confirms that early intervention using anti-VEGF therapy significantly enhances visual outcomes and reduces the risk of complications. Continued follow-up and personalized care are necessary to optimize patient prognosis.

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Conflicts Of Interest- Nil

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