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Editorial

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Retinal Vascular Disease: Pathogenesis, Clinical Features and Management

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Introduction

Retinal vascular diseases encompass a group of disorders that affect the blood vessels of the retina, leading to vision impairment and, in severe cases, blindness. These conditions result from vascular occlusion, leakage, or abnormal proliferation and are often associated with systemic diseases such as diabetes, hypertension, and atherosclerosis. The retina's high metabolic demand makes it particularly susceptible to vascular compromise, emphasizing the importance of early detection and intervention. Understanding the mechanisms, clinical manifestations, and treatment strategies of retinal vascular diseases is essential for preserving vision and preventing long-term complications [1,2].

Discussion

Retinal vascular diseases can be broadly classified into **arterial, venous, and microvascular disorders**. **Retinal artery occlusion (RAO)** occurs when a blockage, often from an embolus or thrombus, obstructs blood flow to the retina. Clinically, it presents with sudden, painless vision loss. Fundoscopic examination reveals a pale retina with a cherry-red spot at the fovea. RAO is an ocular emergency, and prompt systemic evaluation is critical to prevent cerebrovascular complications [3,4].

Retinal vein occlusion (RVO) involves blockage of retinal veins, leading to congestion, hemorrhages, and macular edema. Central retinal vein occlusion (CRVO) and branch retinal vein occlusion (BRVO) are the main types. Patients typically present with painless vision reduction, and fundus examination shows retinal hemorrhages, dilated veins, and cotton-wool spots. Systemic risk factors such as hypertension, diabetes, and hyperlipidemia contribute to the development of RVO [5].

Microvascular retinal diseases, particularly diabetic retinopathy, result from chronic vascular damage. Hyperglycemia leads to endothelial dysfunction, pericyte loss, and capillary leakage, resulting in microaneurysms, hemorrhages, and ischemia. Ischemia stimulates vascular endothelial growth factor (VEGF) production, causing neovascularization and increasing the risk of vitreous hemorrhage and tractional retinal detachment. Hypertensive retinopathy is another microvascular disorder characterized by arteriolar narrowing, arteriovenous nicking, and in severe cases, retinal edema and exudates.

Diagnosis of retinal vascular diseases relies on clinical examination using fundus photography, fluorescein angiography, and optical coherence tomography to assess vascular integrity, retinal edema, and neovascularization. Management involves addressing the underlying systemic condition, pharmacologic interventions such as anti-VEGF therapy for neovascularization and macular edema, laser photocoagulation, and surgical interventions in advanced cases.

Conclusion

Retinal vascular diseases are significant causes of vision loss worldwide, often linked to systemic vascular risk factors. Early detection, accurate diagnosis, and timely management are essential to prevent irreversible visual impairment. Advances in imaging, pharmacologic therapy, and laser techniques have improved outcomes, emphasizing the need for integrated ocular and systemic care in affected patients.

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