Retinal Hemorrhages: A Sign of underlying systemic or ocular disease.

Altinkaynak Emine*

Department of Ophthalmology, Midyat State Hospital, Turkey

Introduction

Retinal haemorrhages are a pathological condition characterized by bleeding into the layers of the retina, the light-sensitive tissue at the back of the eye responsible for visual processing. The presence of haemorrhages in the retina can vary in severity and pattern, and while some may be asymptomatic, others can lead to significant visual impairment. Retinal haemorrhages are not a diagnosis in themselves, but rather a sign pointing to an underlying disease or injury. Their detection often prompts a comprehensive ocular and systemic evaluation to determine the cause and prevent further visual or systemic complications [1].

The retina contains a dense network of tiny blood vessels that are essential for delivering oxygen and nutrients to maintain normal visual function. When these vessels are damaged, due to various local or systemic conditions, they may rupture or leak, leading to haemorrhages in different retinal layers. The location and shape of these haemorrhages—such as flame-shaped, dot-and-blot, or prerenal—provide valuable clues about their origin and the likely underlying pathology [2].

The causes of retinal haemorrhages are diverse and can be broadly categorized into systemic, ocular, and traumatic origins. Among the most common systemic causes is hypertension, which can lead to hypertensive retinopathy and cause the blood vessels to become brittle and prone to leakage. Diabetes mellitus is another major contributor, where chronic hyperglycaemia damages the microvasculature, leading to diabetic retinopathy and progressive haemorrhaging. Blood disorders such as anaemia, leukaemia, and clotting abnormalities may also manifest with retinal bleeding, as can severe infections, including endocarditis or sepsis [3, 4].

In neonates and infants, particularly those who are victims of non-accidental trauma or shaken baby syndrome, retinal haemorrhages are a critical diagnostic finding and can provide important forensic evidence. In adults, blunt trauma to the eye or head, sudden increases in intracranial or intraocular pressure (as seen in Terson syndrome or Valsalva retinopathy), or even rapid deceleration injuries may also result in retinal bleeding. Ocular-specific causes include retinal vein occlusion, which leads to increased venous pressure and vessel rupture, and neovascularization in proliferative retinal diseases, where fragile new blood vessels break easily and bleed [5, 6].

Clinically, patients with retinal haemorrhages may present with a variety of visual symptoms depending on the severity and location of the bleeding. Some may report blurred or distorted vision, floaters, scotomas (blind spots), or even sudden vision loss if the central macula or a large portion of the retina is affected. However, small or peripheral haemorrhages may be entirely asymptomatic and detected only during routine eye exams [7].

Diagnosis involves a comprehensive dilated fundus examination, where an ophthalmologist visually inspects the retina using ophthalmoscopy or slit-lamp bio microscopy. Ancillary imaging techniques, such as fundus photography, fluorescein angiography, and optical coherence tomography (OCT), are often employed to assess the extent of the haemorrhages and to evaluate for associated retinal pathology like edema, ischemia, or neovascularization [8].

Management of retinal haemorrhages focuses on treating the underlying cause rather than the haemorrhages themselves. In diabetic or hypertensive retinopathy, strict control of blood sugar and blood pressure is essential to prevent further damage. Retinal vein occlusions or neo vascular conditions may require intravitreal injections of anti-VEGF agents or corticosteroids to reduce vessel leakage and inflammation. Laser photocoagulation may be used in certain conditions to seal leaking vessels or reduce the risk of further bleeding. In cases of significant prerenal or vitreous haemorrhage that does not clear on its own, surgical intervention such as vitrectomy may be necessary to restore visual function [9].

Long-term prognosis depends largely on the cause, severity, and promptness of treatment. While many retinal haemorrhages resolve spontaneously over time, some may leave behind residual damage such as scarring or persistent vision loss, especially if the macula—the central part of the retina responsible for detailed vision—is involved. Regular follow-up is crucial to monitor for recurrence and to adjust management as necessary [10].

Conclusion

Retinal haemorrhages are a critical sign of underlying ocular or systemic pathology and should never be ignored. They serve as an important diagnostic clue for clinicians, often pointing to diseases such as diabetes, hypertension, vascular occlusions, trauma, or hematologic disorders. Prompt identification and management are vital not only to preserve vision but also

***Correspondence to:** Altinkaynak Emine, Department of Ophthalmology, Midyat State Hospital, Turkey, E-mail: emine.kaynak@gmail.com

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to address potentially life-threatening systemic conditions. Comprehensive evaluation, targeted treatment, and close monitoring remain the cornerstones of care. Ultimately, the eye serves as a window to the body, and retinal haemorrhages remind us of the deep interconnection between ocular health and systemic well-being.

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