Short Communication

Retinopathy Due to Anemia

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ABSTRACT

Anemia-related retinopathy is a common condition, often asymptomatic and discovered incidentally during routine evaluations. A comprehensive, multidisciplinary approach is essential to ensure that even unusual presentations result in positive outcomes, preventing further morbidities and their long-term consequences. We present the case of a 22-year-old woman who reported a rapid decline in vision and sought care at Bodla Eye Care in Multan. She had only one functional eye (right), with the left eye affected by phthisis bulbi. Her best-corrected visual acuity in the right eye was limited to light perception. Systemic evaluation revealed significant pallor, while fundus examination showed preretinal hemorrhage, hard exudates, and Roth spots, primarily confined to the posterior pole. A complete blood analysis was recommended, which revealed a hemoglobin level of 4.5 g/dL, along with significant deficiencies in vitamin B12 and folate. After treatment, vision of our patient improved from hand movement to 6/36. Detailed history the only eye of the patient proving that detailed history of patient illness with proper clinical eye examination is very important in such cases.

Key Words: Anemic retinopathy, preretinal hemorrhages, Intravitreal steroid.

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INTRODUCTION

Retinal abnormalities may be the initial indication of underlying blood disorders, even though the findings are often nonspecific. Ophthalmologists should recognize retinal changes linked to blood disorders, including hemorrhages, cotton-wool spots, Roth spots, exudates, nonperfusion, neovascularization, and infiltration. Eye and vision-related symptoms can sometimes be the first signs of a more serious systemic illness.[1] Unless complete history of patient illness along with the eye complaints is taken, it becomes very difficult to properly diagnose and manage the patient. In our daily practice we may see such patients but incomplete evaluation may lead to misdiagnosis and blindness.

According to the World Health Organization (WHO), anemia is a widespread global issue, affecting about 29.9% of women of reproductive age globally as of 2019. Anemia remains a significant public health concern, particularly among pregnant women and children under the age of five, with high prevalence in many low- and middle-income countries.[2,3] According to the UNICEF Pakistan survey in 2021, approximately 49.1% of children in the country suffer from iron deficiency. This alarming statistic highlights the widespread malnutrition crisis that impacts the cognitive development, immunity, and overall health of children in Pakistan.[4]

Anemia-related retinopathy is well documented. Hemorrhages at all levels of the retina and choroid are common findings, as are Roth's spots, exudates, cotton wool spots, retinal edema, and venous tortuosity (Figure 1). The white Centre of Roth spot could be caused by focal ischemia, inflammatory infiltrates, infectious organisms, fibrin and platelets, or neoplastic cell accumulation.[5] Exact mechanism of anemic retinopathy is still under investigation. However, it appears to be connected to increased capillary permeability, venous stasis and retinal hypoxia.[6]

Ocular investigations are only recommended if retinal signs of anemic retinopathy are detected. In cases of venous blockage, fluorescein angiography may show a delay in the arteriovenous transit time. In cases of vascular blockage, optical coherence tomography (OCT) is helpful to show macular edema. Additionally, people with cancer conditions and autoimmune illnesses can exhibit retinal degeneration in anemia. Therefore, in addition to a full blood count, blood examinations should also look at peripheral blood smears. In some circumstances, bone marrow biopsy may be necessary.[7]

Retinopathy often resolves on its own when the underlying causes, such as anemia, are treated. However, macular edema resulting from vascular occlusion may require specific interventions. In cases of sub hyaloid hemorrhage, Nd: YAG laser Hyaloidotomy might be necessary to address the condition effectively.

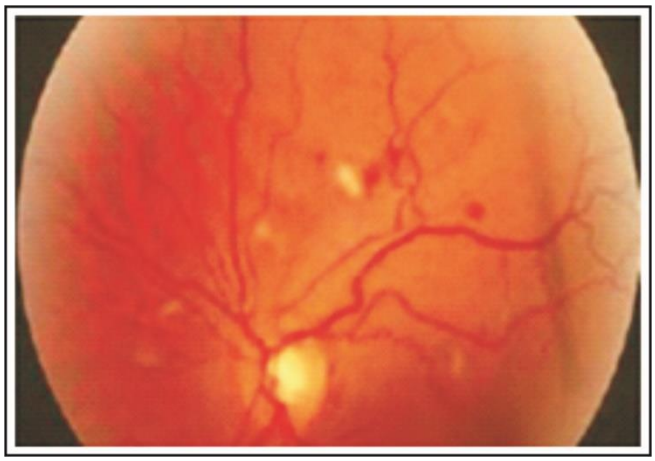

Figure.1: Fundus photograph of an anemic patient showing retinal hemorrhages, cotton wool spots and venous tortuosity in anemic retinopathy.

Case Representation

A 22-year-old woman presented to Bodla Eye Care in Multan, complaining of a rapid decline in vision. She had vision in only one eye (right), with the left eye affected by phthisis bulbi. At the time of examination, her best-corrected visual acuity in the right eye was limited to light perception, while the left eye had no light perception. Systemic evaluation revealed significant pallor, tachycardia of 100 beats per minute, and blood pressure of 100/75 mmHg. Fundus examination showed preretinal hemorrhages, hard exudates, and Roth spots, primarily in the posterior pole. A complete blood count revealed severe anemia, with a hemoglobin level of 4.5 g/dL, as well as significant B12 and folate deficiencies. Platelet count was 950/mm³, and leukocyte count was 4.2×10⁹/L. She was referred to a hematologist for anemia treatment. For pre-retinal hemorrhage, intravitreal Ranibizumab was given. After three months, her hemoglobin increased to 7.9 g/dL, her BCVA improved to 6/36 in the right eye, and both disc edema and pre-retinal hemorrhage resolved. Figure 2 and 3 show fundus pictures before and after treatment.

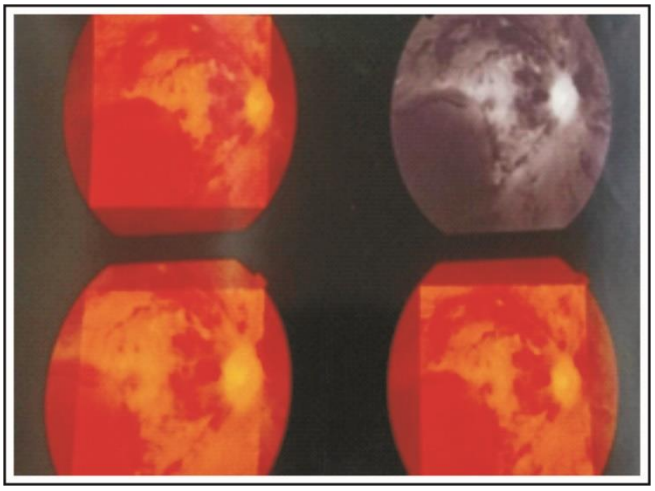

Fig.2: Fundus photograph before treatment.

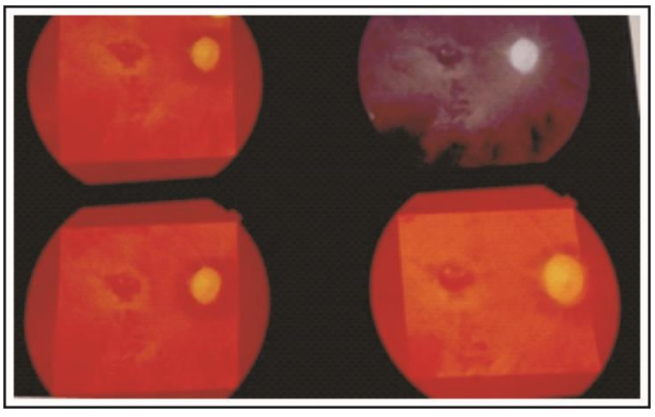

Fig.3: Fundus photograph after treatment.

DISCUSSION

In this case, the severity of the retinal abnormalities, along with anemia and B12 and folate deficiencies, are critical factors to consider. It is essential for healthcare professionals to remain vigilant in identifying patients who may present with seemingly unrelated symptoms

that, in fact, are interconnected manifestations of the same underlying condition. We stress the importance of a thorough, multidisciplinary approach in such cases to ensure early detection and treatment. In women particularly of child bearing age, anemia can be related to increased rates of maternal and perinatal death, low birth weight babies, and pre-term birth.[8] Therefore, it is essential to diagnose these cases for the sake of the patients and also our national health standards. It is interesting to note that despite the retinal alterations and apparent worrisome vision loss that we have amply documented prior to and after, the response to routine treatment was encouraging. We cannot overstate the importance of treating the underlying illness given our clear clinical picture of it.

In another case report, a young male patient with severe symptomatic bilateral hemorrhagic retinopathy, secondary to aplastic anemia, experienced nearly complete spontaneous resolution of the retinopathy and significant vision improvement following systemic allogenic hematopoietic stem cell transplantation. This recovery occurred over a 16-week period.[9] Improvement in vision after blood transfusion in a case of anemic retinopathy is also reported.[10]

We want to emphasize how important it is for all medical personnel to be particularly watchful in spotting patients who might exhibit seemingly unrelated symptoms but are actually manifestations of the same illness. Our exhaustive analysis also subtly demonstrates how a nutritional shortage may produce such a concerning picture with far-reaching effects.

CONCLUSION

Anemia-related retinopathy, though often asymptomatic, can lead to severe visual impairment if not promptly addressed. This case underscores the importance of a thorough, multidisciplinary approach to diagnosing and managing such conditions.

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Conflict of Interest: Authors declared no conflict of interest.

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Maria Afzal Bodla; Radiologist and Senior Registrar: *Manuscript review.*

Nalain Syedah; Optometrist and Ophthalmic Diagnostic Specialist: *Manuscript preparation, Manuscript editing.*