



Case Report

A Case Report of Leukemic Retinopathy

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ABSTRACT

Leukemia is a clonal hematological malignancy characterized by uncontrolled proliferation of abnormal white blood cells. Chronic Myeloid Leukemia (CML) is associated with the Philadelphia chromosome, resulting in the *BCR-ABL* fusion gene. Ocular manifestations occur in 9-20% of patients, with leukemic retinopathy being the most common and occasionally the first presenting sign. Early recognition of retinal findings can lead to timely diagnosis and improved outcomes. A 26-year-old male presented with painless diminution of vision in both eyes. The right eye had a gradual visual loss over two months, while the left eye had sudden, painless loss of vision. Visual acuity was 6/36 in the right eye and counting fingers at five meters in the left eye. Anterior segment examination was normal. Fundus examination revealed multiple retinal hemorrhages and Roth spots in all quadrants of both eye. Hematological evaluation showed markedly elevated white blood cells (28,629 \times 103/ μ L) with thrombocytosis. Peripheral blood smear suggested CML. Bone marrow aspiration confirmed CML in the chronic phase. The patient was referred to the Oncology department and initiated on appropriate systemic therapy. Ophthalmic management was conservative with close follow-up. Visual prognosis was explained to the patient, emphasizing the importance of systemic disease control. Leukemic retinopathy may be the initial manifestation of CML. The retina serves as a window for early detection of systemic diseases, highlighting the importance of fundus examination in unexplained visual loss.

Keywords: Diminution of vision, Retinal hemorrhages, Roth spots

INTRODUCTION

Leukemia is a malignant disorder of the hematopoietic system characterized by abnormal proliferation of leukocytes and their precursors. Chronic Myeloid Leukemia (CML) accounts for approximately 15–20% of adult leukemias and is defined by the presence of the Philadelphia chromosome, caused by the reciprocal translocation(9;22) (q34;q11). This translocation results in the *BCR-ABL* fusion gene, leading to constitutive tyrosine kinase activity and uncontrolled myeloid proliferation. Ocular involvement in leukemia has been reported in up to 20% of cases and may occur at any stage of the disease.¹⁻⁴ Leukemic retinopathy is the most common ocular manifestation and usually results from secondary hematological abnormalities rather than direct leukemic infiltration. Retinal hemorrhages, Roth spots, cotton wool spots, and venous tortuosity are commonly observed.⁵⁻¹⁰

CASE REPORT

A 26-year-old male presented to the ophthalmology outpatient department with complaints of decreased vision in both eyes. The vision loss was painless. The right eye showed gradual,

progressive vision loss over 2 months, while the left eye showed sudden, painless vision loss. There was no history of trauma, ocular pain, redness, or systemic illness. Best corrected visual acuity was 6/36 in the right eye and counting fingers at five meters in the left eye, with no improvement on pinhole testing. Anterior segment examination of both eyes was within normal limits. Pupillary reactions and intraocular pressure were normal. Fundus examination revealed multiple superficial and deep retinal hemorrhages and Roth spots involving all quadrants of both eyes [Figure 1a and b].

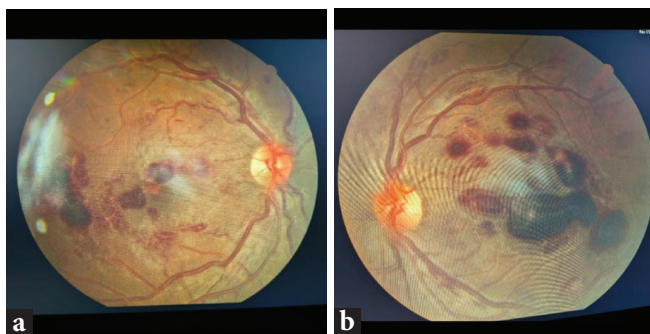


Figure 1: (a) Right eye fundus photo taken by fundus camera (b) Left eye fundus photo taken by fundus camera

Investigations

Complete blood count revealed markedly elevated total leukocyte count of $28,629 \times 10^3/\mu\text{L}$ and increased platelet count. Hemoglobin levels were mildly reduced. Peripheral blood smear showed features consistent with CML. Bone marrow aspiration confirmed CML in the chronic phase, and the patient was referred to the Oncology department for further management.

DISCUSSION

Leukemic retinopathy reflects systemic hematological abnormalities such as anemia, thrombocytopenia, hyperviscosity, and capillary occlusion.^{3,8} Retinal hemorrhages result from vascular fragility and impaired circulation.⁸ Roth spots represent focal hemorrhages with white centers composed of fibrin, leukemic cells, or inflammatory infiltrates.⁷ Ocular manifestations may precede systemic symptoms, making ophthalmic examination critical for early diagnosis.^{2,4} Leukemic retinopathy has been reported as the presenting feature of CML in several case reports.^{5,6} Prompt initiation of systemic therapy often leads to resolution of retinal findings and improvement in visual function.^{5,9} Vitreous hemorrhage remains one of the most sight-threatening complications.^{9,10}

CONCLUSION

This case highlights leukemic retinopathy as an important ocular manifestation and potential presenting feature of

CML. Ophthalmologists play a crucial role in early detection and referral. The retina truly serves as a window for early assessment of systemic disease.

Author's contribution: All Authors contributed equally to the work.

Ethical approval: Institutional Review Board approval is not required.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given consent for their images and other clinical information to be reported in the journal. The patient understands that the patient's names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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