Case Report
International Journal of Silkroad Institute of Research and Training (IJSIRT)
Vol-2. No. 2, Jul-Dec 2024 DOI: 10.3126/ijsirt.v2i2.74374 ISSN: 2990-7837 (Online & Print)

A Case of Leukemic Retinopathy

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ABSTRACT

This case report describes a 4-year-old male with a known history of acute leukemia, presenting with blurred vision in both eyes following chemotherapy. On examination, the child exhibited central, steady, and maintained vision, with findings suggestive of leukemic retinopathy, including scattered retinal infiltration, vitreous cells, and exudative retinal detachment in both eyes. Leukemic retinopathy, a rare ocular manifestation of leukemia, often arises from the direct infiltration of leukemic cells and is more commonly seen in acute leukemia. Ocular involvement, which may include retinal hemorrhages, cotton wool spots, and tortuous veins, can serve as an indicator of disease progression and affect prognosis. The patient was managed with topical steroids for vitritis and referred to oncology for systemic reassessment. This case highlights the importance of recognizing ocular involvement in leukemia, as the eye can reveal direct signs of leukemic infiltration and aid in early diagnosis or monitoring of relapse. Close collaboration between ophthalmologists and hematologists is crucial for optimizing patient care and improving both visual and overall outcomes.

Key words: leukemia; retinopathy; ocular.

Received: 17th October, 2024 Accepted: 2thNovember, 2024 Published: 21th January, 2025

INTRODUCTION

Leukemia is a neoplasti c disorder caused by abnormal proliferation of hematopoietic stem cells that replace the normal bone marrow. Haematological malignancies may be associated with ocular manifestations in up to 50% of cases, and ocular symptoms can be the initial presentation.[1] Both acute and chronic leukemia can cause ocular manifestation, whereas retina is the most common ocular tissue to be involved in leukemia. Patient with leukemic retinopathy may experience a more aggressive course and worse overall disease outcome. Studies have shown a significantly shorter mean survival rate in leukemic patient with leukemic retinopathy compared with those without (21.4% vs 45.7%).[2] It has also been shown that among patients with leukemic retinopathy, the mean survival rate was significantly shorter in those with cotton wool spots than those without. Haematological parameters such as raised WBC and a low platelet count have been shown to corelate with retinal changes in leukemic patients.[3-5]

CASE REPORT

A 4 years old male from Rautahat, Nepal with a known history of blood cancer (acute leukemia) under post-chemotherapy(completed 4 doses), presented in paediatric department of Bharatpur Eye Hospital with complaints of blurred vision in both eye. NVD was at 38 weeks of gestation, his birth weight was 2.5kg with no admission in NICU and no supplement of oxygen. There was no family history of cancer and other diseases. His visual acuity was Central, Steady and Maintained in both eye at presentation and dry retinoscopy revealed +16.0Dsp in RE and +12.0 in LE Orthoptic evaluation showed roughly (10-15 degree) Esotropia by HBT. Extraocular motility showed underaction of lateral rectus, superior rectus and inferior rectus in RE and was full in LE. On distant direct ophthalmoscopy Leucocoria was present in both eye.

On slit lamp examination, cornea and lens showed clear. Anterior chamber was normal Pupil was round, regular and reactive with grade III RAPD in RE. Fundus evaluation under mydriasis (FEUM) revealed scattered retinal infiltration through optic disc bilaterally, suggestive of leukemic infiltration. Grade IV cells were noted in Vitreous cavity in both eyes. Retinal detachment was noted inferiorly in the right eye. Optic nerve head examination showed hyperaemia of the disc with peripapillary atrophy.

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Figure 1. Leukocoria seen in patient's eye.

Table 1. Grading of vitreous haze (Nussenblatt 1985/ National Eye Institute).

Score	Description	Clinical findings
0	Nil	None
0.5+	Trace	
1	Minimal	Posterior pole clearly visible
2	Mild	Posterior pole details slightly hazy
3	Moderate	Posterior pole detail very hazy
4	Marked	Posterior pole details barely visible
5	Severe	Fundal details not visible

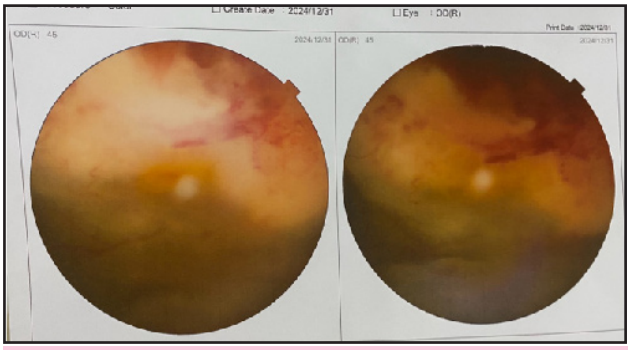

Figure 2. Fundus photo of Right eye.

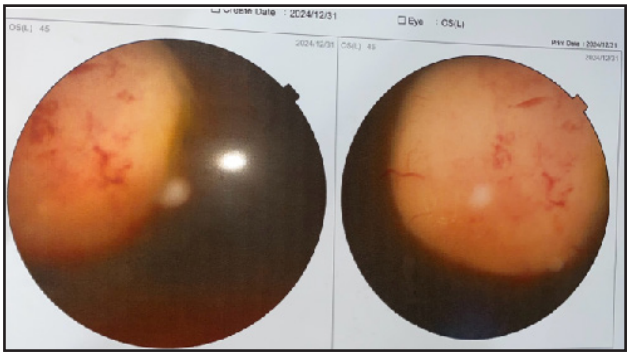

Figure 3. Fundus photo of Left eye.

Impression

Leukemic Retinopathy with Exudative Retinal Detachment with Vitritis (Both Eye)

Management

For vitritis, topical steroid (Prednisolone Acetate 1%) was given in tapering doses weekly.

Immediate referral to oncology department for systemic reassessment was done. Close monitoring for progression and initiation of localised or systemic therapy as required. Patients should be treated for the underlying leukemia by chemotherapy, immunotherapy or radiotherapy. While there is no direct curative treatment for leukemic retinopathy, such approaches can help diminish the systemic disease.

DISCUSSION

Leukemic Retinopathy was first described by Liebriech in 1861 which is a rare condition that may arise from direct infiltration of cancerous leukocytes and is a condition seen in both acute and chronic leukemia however it is more commonly observed in acute leukaemia. The prevalence of ocular involvement in leukemic patient has been reported to be between 9% to 90% in various studies. Classic features of retinopathy are dilated, tortuous, irregular retinal veins , dot blot haemorrhages, Roth spots , peri retinal haemorrhages, hard exudates , cotton wool spots etc . Most obvious observations are Retinal Haemorrhages which are most typically located in posterior pole at any layer . Sub retinal haemorrhages are rarely observed and there may be white component in the intra retinal haemorrhage which is typically a white dot made up of leukemic cells.

CONCLUSIONS

Knowledge of ocular involvement in leukemia is important because the eye is only site where the leukemic involvement of nerves and blood vessels can be observed directly .This is so because the eye symptoms may be the initial mode of presentation of the systemic illness, or the first manifestion of relapse after inducing chemotherapy. Close collaboration between ophthalmologist and haematologist is essential in order to provide optimal care for the

patient and improve their visual and more importantly their overall prognosis.

Prognosis

The 5-year survival rate was found to be significantly lower in those with leukemic retinopathy on presentation than in those without ophthalmic involvement (21.4% vs. 45.7%).

Patients with clinical leukemic retinopathy may have more aggressive systemic disease that might lead to a worse prognosis.

Conflict of Interest: None

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Citation: Bhattarai S, Maharjan S, Shah R, Shrestha A. A Case of Leukemic Retinopathy. IJSIRT. 2024; 2(2):115-117.