

Case Report

Bilateral Profound Visual Loss As a Consequence of Leukaemia – A Case Report

Raajini Devi K, Safinaz MK, Hazlita MI

Department of Ophthalmology, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia.

Abstract

An 18-year-old Malay gentleman was noted to have profound bilateral blurred vision for one month duration, associated with loss of weight, appetite, low grade fever and abdominal distension. Visual acuity on presentation was 6/60 on the right, counting finger on the left with no afferent pupillary defect. Anterior segments were unremarkable. Vitreous cells were occasional bilaterally. Fundus revealed multiple choroidal and sub-retinal Roth spots with areas of pre-retinal and intra-retinal haemorrhages, involving the macula in the left eye. Vessels were dilated and tortuous in all quadrants of the right eye. Many areas of capillary fall out at peripheral retina were demonstrated in fundus fluorescein angiogram. Further systemic and laboratory review confirmed the diagnosis of CML and chemotherapy was initiated. Both eye ischaemic retinopathy secondary to CML was confirmed and scatter pan retinal photocoagulation was performed bilaterally. Good improvement in vision noted during subsequent follow up to 6/24 on the right, 6/60 on the left. High levels of suspicion and accurate early recognition of fundus changes are vital in these types of cases to ensure the institution of prompt treatment.

Keywords: Visual loss, ischemic retinopathy, leukaemia, chemotherapy, photocoagulation

Correspondence:

Raajini Devi a/p Krishnan, Department of Ophthalmology, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia. Tel: 03-9145 7207 Fax: 03-9145 6733 Email: muts_002@yahoo.com

Date of submission: 5 Sept, 2014

Date of acceptance: 9 Feb, 2015

Introduction

Leukaemia is characterised by neoplastic proliferation of white bloodcells which is categorized into myelogenous and lymphocytic origins, and are further subdivided based on acute or chronic phases. CML, (chronic myeloid leukemia, also known as chronic myelocytic leukemia) accounts for 15% to 20% of adult leukemias. It is associated with a BCR-ABL fusion gene, better known as the Philadelphia Chromosome that is seen in mostly 95% of patients, which encodes for an active protein tyrosine kinase. This protein is the important site of action of designed drugs for this disease (1). We report a case of chronic myeloid leukaemia with ocular manifestations as the initial presentation, requiring prompt and accurate diagnosis in tackling the underlying cause in such cases.

Case Report

An 18-year-old Malay gentleman presented with bilateral profound blurred vision for duration of a month. Further history taking gathered associated symptoms of loss of appetite and weight with episodes of low grade fever and abdominal distension within the same time frame for which, he did not seek medical treatment, as it was not as significant as the visual disturbance. Visual acuity at presentation was 6/60 on the right and counting finger on the left. No afferent pupillary defect noted. Anterior segments were unremarkable. Occasional vitreous cells were seen bilaterally. Both fundi revealed pink optic discs with a cup to disc ratio of 0.3. Multiple choroidal and subretinalroth spots distributed throughout all the quadrants with numerous pre and intra retinal haemorrhages involving the left macula. Vessels on the

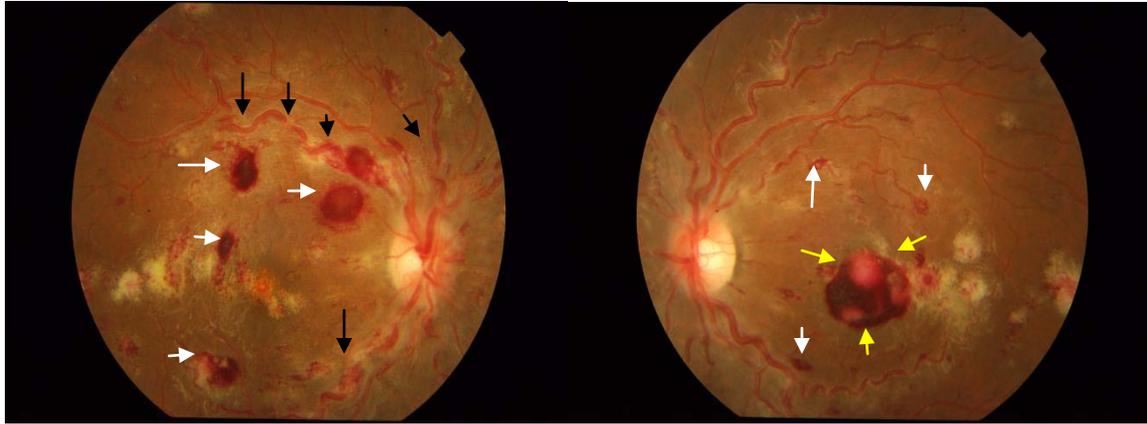


Figure 1: Fundus photographs showing multiple haemorrhages bilaterally (white arrows), with right venous tortuosity (black arrows) and left macula involvement (yellow arrows).

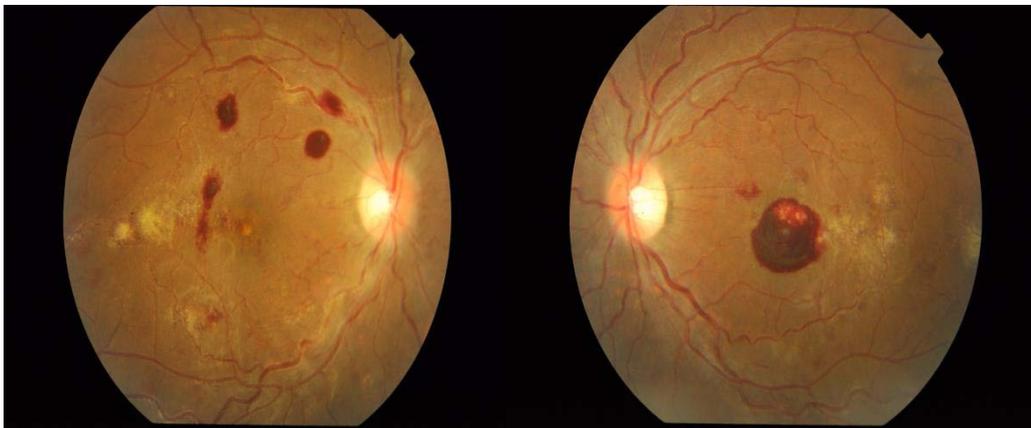


Figure 2: Fundus photographs showing resolved haemorrhages bilaterally with less venous tortuosity

right fundus were exceptionally dilated and tortuous (Fig 1).

Urgent fundus fluorescein angiogram (FFA) revealed multiple numerous areas of capillary fall out (CFO) at the peripheries, however with a normal filling time. Systemic review showed evidence of hepatosplenomegaly despite him appearing clinically well. Further haematological profile showed hyperleukocytosis, to $570 \times 10^9/l$. Bone marrow aspiration cytology and trephine biopsy brought about the diagnosis of chronic myeloid leukaemia (CML) in chronic phase, substantiated with abnormal Fluorescence in situ hybridization (FISH) result, positive for BCR/ABL translocation. Magnetic resonance imaging (MRI) brain and orbit did not produce any evidence of Leukemic infiltrations. He was subjected to multiple sittings of leukopheresis and was commenced with intravenous Cytarabine 150 mg daily initially and later oral Imatinib 200 mg daily, subsequently changed to Nilotinib 300 mg twice daily.

A diagnosis of bilateral ischaemic retinopathy secondary to CML was established and we proceeded with bilateral scatter pan retinal photocoagulation. Subsequent follow up visit showed significant improvement in vision to 6/24 on the right and 6/60 on the left. There was a marked reduction of haemorrhagic areas and infiltrates in both fundi (Fig. 2). Repeat FFA demonstrated reduction in the CFO areas with a better perfusion of retinal vasculature.

Discussion

Many underlying systemic pathologies, commonly diabetes mellitus, hypertension, anaemias and leukaemia may present with bilateral retinal haemorrhages. In this case, a laboratory analysis of blood counts with differentials and cytological analyses were mandatory in confirmation of CML and hence the leukemic retinopathy. CML can remain asymptomatic in up to 50% of cases (2). Leukemic ocular involvement can be seen in any structure within

the eye. Retinal and choroidal involvement are commonly seen during the course of the illness, reported in up to 50 to 90% of cases, usually rare as the presenting symptoms, however demonstrated that it may not always be true as in this case. Roth spots (which refers to haemorrhages with white centers containing platelet fibrin deposits or leukemic infiltrates), retinal neovascularization and retinal venous tortuosity or obstruction are some of the features frequently seen in leukemic retinopathies (3). Ocular manifestations of CML patients are not to be taken lightly as they demonstrate a lower 5-year survival compared with those without (4). Chronic phase CML is best treated with tyrosine kinase inhibitors (TKIs) namely Imatinib which is the first line of treatment currently, which is recommended to be maintained for long duration to avoid relapse of the disease (5). Nilotinib however is noted to be more potent and effective in producing molecular and cytogenic response in newly diagnosed chronic phase CML (6). Others include interferon alpha, cytotoxic agents such as hydroxyurea, lastly allogeneic hematopoietic cell transplantation. Recent study indicate that tumor necrosis factor (TNF)-related apoptosis-inducing ligand (TRAIL) has the CML cells apoptosis-inducing property. It is also noted that dasatinib and TRAIL combination has brought about good therapeutic effect. Underlying retinopathy usually shows resolution with the treatment of CML (8).

Conclusion

Leukemic retinopathies usually show a good recovery when the underlying cause is well recognised and treated early. High levels of suspicion and accurate early recognition of fundus changes are vital in these types of cases to ensure the institution of prompt treatment to secure good visual potentials. Immediate initiation of oral tyrosine kinase inhibitors (TKIs) such as Imatinib and Nilotinib and local ocular laser

therapy to minimise the local ocular ischemia has brought about good clinical response in this case. Any delay in the initiation of the laser therapy would have compromised his vision and lead to irreversible visual loss.

References

1. Gordon KB, Rugo HS, Duncan JL, et al. Ocular manifestations of leukemia: leukemic infiltration versus infectious process. *Ophthalmology* 2001; 108(12): 2293-2300.
2. Hua LV, Williams SK. Sudden unilateral visual loss as an initial presentation of chronic myelogenous leukemia. *Clinical Optometry* 2010; 2: 29-35.
3. Caillaux V, Querques G, Ramahefasolo C, Darugar A, Souied EH. Bilateral macular serous retinal detachment revealing acute myeloblastic leukemia. *Retin Cases Brief Rep* 2013; 7(1): 62-6.
4. Huang PK, Sanjay S. Visual Disturbance as the first Symptom of Chronic Myeloid Leukemia. *Middle East Afr J Ophthalmol* 2011; 18(4): 336-8.
5. Faber E. Has the time come for induction and maintenance imatinib therapy in chronic myeloid leukemia? *Leuk Res* 2009; 33(5): 605-6.
6. Saglio G, Kim DW, Issaragrisil S, et al. Nilotinib versus imatinib for newly diagnosed chronic myeloid leukemia. *N Engl J Med* 2010; 362(24): 2251-9.
7. Thompson CB. Attacking Cancer at Its Root. *Cell* 2009; 138(6): 1051-4.