Case Report

SUDDEN VISUAL LOSS AS INITIAL PRESENTATION OF CHRONIC MYELOID LEUKEMIA: A CASE REPORT

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ABSTRACT

A healthy, 26-year-old Chinese gentleman presented with sudden onset of reduced vision in the right eye associated with floaters. He claimed to be lethargic for the past three weeks prior to presentation. There was no history of other constitutional and systemic symptoms. He has no significant family history of malignancy or eye problem. Examination revealed right best corrected visual acuity (BCVA) of 6/36 and left BCVA was 6/9. Anterior segment examinations were normal. However, funduscopy revealed bilateral hyperemic optic discs swelling, dilated and tortuous retinal veins with multiple dot and blot haemorhages including Roth spots. There was also vitreous haemorhage in the right eye. The other cranial nerves were normal. Systemic examination revealed no organomegaly. Blood investigations were suggestive of Chronic Myloid Leukemia (CML) in chronic phase.

Keywords: *chronic myeloid leukemia, vitreous hemorrhage, retinal hemorrhage, sudden reduced vision.*

Introduction

Chronic myeloid leukemia is a myeloproliferative disorder characterized by overproduction of mature, but abnormal, myeloid white blood cells[1]. It is associated with a reciprocal chromosomal translocation t(9; 22) (q34; q11) resulting in a BCR-ABL fusion gene (Philadelphia chromosome)[2]. Ocular manifestation as the first presenting signs for leukemia is rare especially in chronic phase of the disease[3]. Ocular symptoms were present in only 10% of patient at initial diagnosis and majority of cases remains asymptomatic[4]. Ocular involvement is either due to direct infiltration of the orbit and other tissues (iris, choroid, optic nerve and retina) vascular abnormalities affecting the retina (intraretinal hemorrhages, white-centered retinal hemorrhages, cotton- wool spots, macular hemorrhage, subhyaloidhemorrhage, vitreous hemorrhage), or neuro-ophthalmic signs (papilledema secondary to raised intracranial pressure, isolated cranial nerve palsies) of central nervous system (CNS) disease[4]. This case highlights the rare extramedullary presentation of CML with only ocular symptoms.

Case Report

A 26-year old Chinese gentleman presented with sudden onset of painless blurring of right vision of one day duration. It was associated with floaters but no flashes. He was not myopic. There was no history of trauma or red eyes; neither was there any significant past ocular history. His left vision was good. He claimed to be lethargic for past three weeks prior to presentation. On further questioning, no other constitutional symptoms were elicited. Ocular examination revealed best corrected visual acuity (BCVA) of 6/36 in the right eye and 6/9 in the left eye. Anterior segment examinations were normal. Pupillary light reactions were also normal. However fundus examination revealed bilateral hyperemic optic discs swelling, dilated and tortuous retinal veins and multiple dots blots haemorhage with Roth spots (Figure 1). No evidence of intraocular inflammation or retinal tear. Optic nerve functions were also normal. There was presence of vitreous haemorhage in the right eye but no similar haemorrhages in the other eye. Other cranial nerves and systemic examinations were normal. There was no lymphadenopathy or abdominal organomegaly. Full blood count revealed white cell count of 170 x 10^9 per liter and full blood picture was suggestive of CML in chronic phase. This was later confirmed by bone marrow aspiration and trephine (Figure 2). His cyto-chromosome analysis and FISH findings were consistent with BCR/ ABL translocation at t(9;22) in 65% of the cells. He was diagnosed with CML in chronic phase with hyperviscosity syndrome. Immediate treatment was commenced, leukapheresis was done twice for the patient and he was started on a full chemotherapy regime.

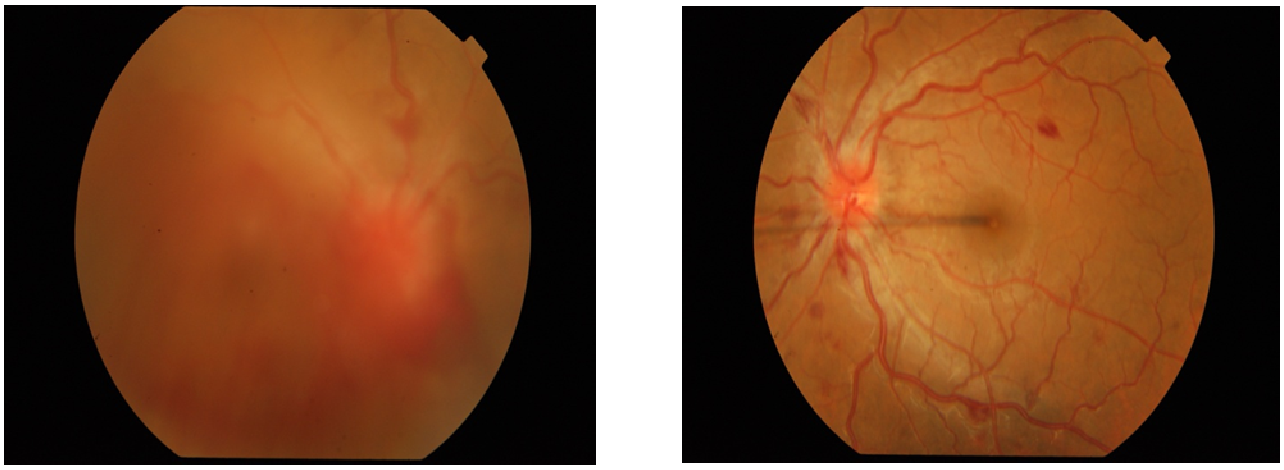

Figure 1:
Right eye: fundus photo : hazy media due to vitreous haemorrhage, optic disc swelling and retinal hemorrhages
Left eye : optic disc swelling with multiple retinal hemorrhage including Roth spot.

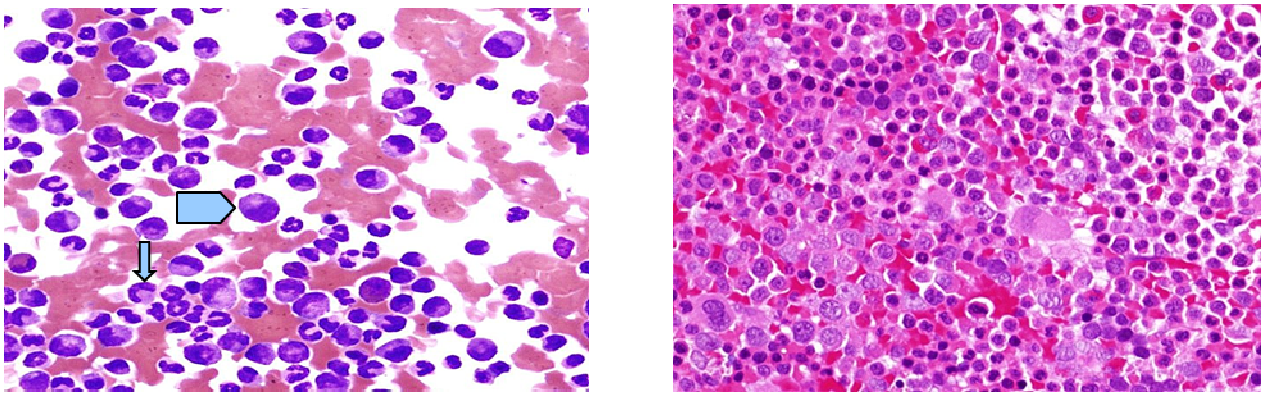

Figure 2: Left picture: bone marow aspirate with numerous myeloid cells, including myelocytes (big arrow) and metamyelocytes(small arrow) (hematoxylin and eosin, x40). Right picture is a bone marrow trephine shows marked hypercellularity with less fat (hematoxylin and eosin, x40).

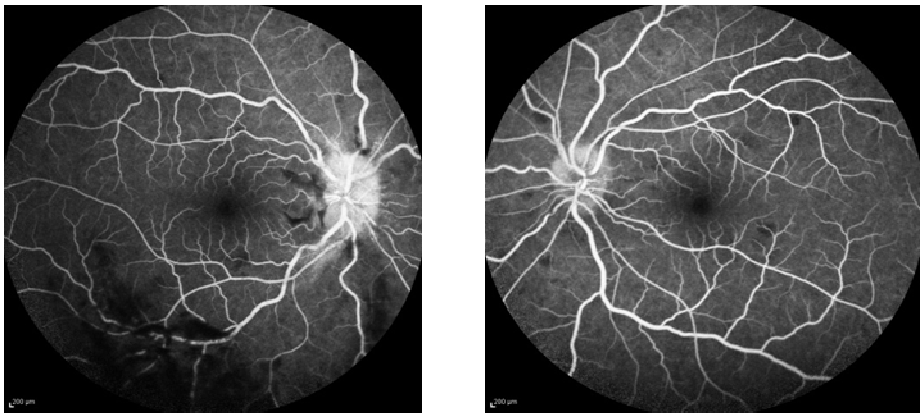

Figure 3: Right eye fundus fluorescein angiography taken 3 weeks after initial presentation showed hyperfluoresce of the optic disc comparing to left eye. There is also masking effect by the remaining vitreous haemorhage on right eye. No areas of capillary fall out.

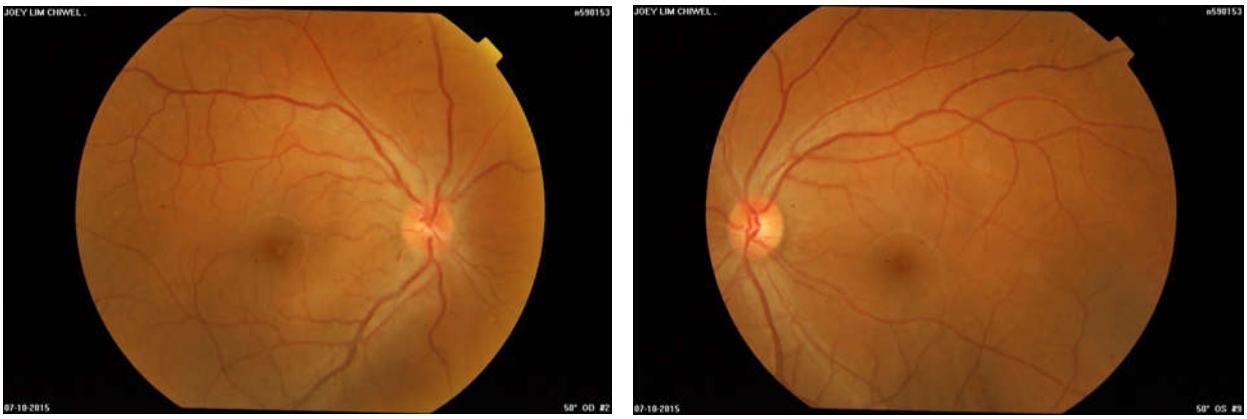

Figure 4: Both eyes fundus photo at 6 months. Media is clear, no vitreous haemorrhage. Optic discs are pink with clear margin. No more retinal haemorrhages.

During follow up, fundus fluorescein angiography was performed and no ischaemic area was noted (Figure 3). He regain his 6/6 vision in both eyes after 3 weeks of presentation with resolution of optic disc swelling, vitreous haemorrhage and retinal haemorrhages. Complete resolution was achieved totally 6 month post presentation (Figure 4).

Discussion

Chronic myeloid leukemia comprises only 2%–3% of all the leukemia diagnosed in patients less than 20 years of age, the incidence was reported to increase with age[5]. It is also more common in male compared to female[5]. In general, CML comprises of 3 stages. The first stage of chronic phase comprises of gradual increase of white cell count and presence of less than 15% of blast cells. Splenomegaly, weight loss and B symptoms were also the known criteria. The second stage is the accelerated phase characterized by worsening of white cells count in a previously controlled disease. There will be 15-30% of blast cells in the peripheral blood. Organomegaly and new chromosomal abnormality may be acquired. Lastly is the blast crisis phase characterised by more than 30% of blast cells in the peripheral blood film. Patients will manifest as acute leukemic syndrome including the B symptoms and bone pain[1].

Ocular manifestation of leukemia occurs in both acute and chronic leukemia[6]. Autopsy result published by Kincaid and Green reported 82% of acute leukemia had ocular findings compared to 75% with chronic leukemia[6]. Patients are usually asymptomatic at presentation. Reddy et al reported only 10% of patients are symptomatic[4]. Orbital and ocular lesions are the third most frequent extramedullary location of acute leukemia after the meninges and testicles[7].

Mechanism of ocular involvement are either due to the direct leukemic infiltration or due to the abnormal haematology component such as thrombocytopenia, anaemia, and hyperviscosity causing ischemia, or by opportunistic infections[8]. Optic nerve involvement occured in up to 13-18% of cases[9]. In this case, optic nerves swelling are most likely due to hyeprviscosity syndrome as optic nerve functions are absolutely normal. Optic nerve infiltration commonly presented with poor vision. Poor vision in the right eye in this patient was mainly due to the presence of vitreous haemorrhage. There was no sign of ischaemic changes. Therefore, the exact mechanism of vitreous haemorrhage in this case could not be ascertained. Few possible causes were either due to the hyperviscosity condition or early platelet dysfunction. Underlying hyperviscosity syndrome could possibly cause vascular stagnation which increases the intravascular pressure. This might lead to vitreous haemorrhage**.** Another possible pathogenesis was due to the possibility of early platelet dysfunction. Despite normal level of platelet count, increase of peripheral blast cells might cause alteration of the normal thrombotic function to a certain extend.

Retina is the most common site for ocular involvement. Retinal haemorrhages, Roth spots, microaneurysm, dilated retinal veins, cotton wool spots and vascular sheathing are common findings[10]. In our case, ocular presentation are most likely due to the hyperviscosity syndrome causing retinal vessels engorgement and early optic disc swelling. No retinal ischaemia was evident on the retinal fluorescein angiography. In hyperleukocytosis, blasts of the monocytic, myelocytic or myelomonocytic cells accumulate and destroyed the microvasculature of the retinal vessels. This can either cause veins occlusions or perivascular leukemic infiltration. Roth spot hemorrhages may represent small areas of retinal leukemic infiltration or platelet fibrin deposits from the damaged retinal capillaries[11]. Our patient underwent plasmapharesis twice during admission. Normalisation of his white count was achieved after few weeks of treatment. This has most likely assist the resolution of the ocular condition, at the same time prevent further ischaemic changes due to hyperviscosity.

Ohkasi et al reported 5 year survival rate of patient with

ocular manifestation was 21.4% compared to 45.7% in non ocular involvement, suggestive of potential poorer prognosis for patients with that ocular involvement[12]. However, patient with chronic phase CML at the time of diagnosis have the best long-term prognosis with treatment[13]. Therefore, this case illustrates the importance of high clinical suspicious in early diagnosis of leukaemia. The prompt recognition of his ocular fundus findings and early referral to oncologists for adequate management may have been a major factor in determining his long-term outcome.

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