Case Report

An unusual association of Morning Glory Syndrome with chronic myeloid leukemia-Philadelphia chromosome

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Abstract

Morning glory disc anomaly (MGDA) is a rare congenital malformation that results from the incomplete formation of the optic nerve in utero. The majority of the patients have unilateral involvement and poor vision leading to sensory strabismus. Morning Glory Syndrome (MGS) may be a part of other syndromes and systemic abnormalities like transsphenoidal basal encephalocele, midfacial malformations, absent optic chiasma, MoyaMoya syndrome, and renal agenesis. In the present report, we describe a patient with a large disc with an excavated posterior scleral opening with a white glial tuft at the centre. The blood vessels were increased in number and arranged radially from the disc with peripapillary hyperpigmentation in clumps. Funnel-shaped excavation of the posterior globe was also noted on MRI. Associated ocular features were microcornea, nystagmus, esotropia, and systemic features included chronic myeloid leukemia- Philadelphia chromosome (CML-PC) and empty sella turcica. We report an unusual association of MGS with CML-PC.

Keywords: Chronic myeloid leukemia-Philadelphia chromosome, microcornea, morning glory syndrome

Introduction

Morning glory disc anomaly (MGDA) is a rare congenital malformation that results from the incomplete formation of the optic nerve in utero.[1] Optic nerve and retinal involvement have been previously reported in early-stage CML[2-5] but so far there are no reports published on the association between MGS and CML-PC. We report an unusual association of MGS with CML-PC.

Case Report

A 47-year-old male patient presented with itching in both eyes for 3 days. His best-corrected visual acuity (BCVA) in the right eye (RE) was finger counting half a meter with accurate projection of rays and 20/20 with refractive correction of +0.75 sph/-0.75 cyl at 163° axis in the left eye (LE). On detailed history, the patient revealed poor vision and inward deviation of RE since early childhood. He was also diagnosed with CML-PC, confirmed with both bone marrow examination and BCR/ABL fusion gene test and was started on Tablet Nilotinib 400 mg twice a day by the hematology team at our Institute. On ocular examination, there was 30° esotropia in the RE on Hirschberg test. Extraocular movements were full and free in both eyes with inferior oblique overaction and latent nystagmus in the RE [Figure 1]. On slit-lamp examination, papillae were seen over the palpebral conjunctiva in both the eyes. RE microcornea (8 × 8 mm) was noticed incidentally, although the corneal diameter of LE (11.5 × 11 mm) was normal [Figure 2]. Dilated fundus examination of RE revealed a large disc with excavated posterior scleral opening with a white glial tuft at the centre, similar to petals on a flower [Figure 3R]. The blood vessels were increased in number and arranged radially from the disc with peripapillary hyperpigmentation in clumps suggestive of

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Received: 19-05-2020 **Revised:** 14-06-2020
Accepted: 19-06-2020 **Published:** 25-08-2020

Access this article online

Quick Response Code:

Website: www.jfmpc.com

DOI: 10.4103/jfmpc.jfmpc_892_20

How to cite this article: Panyala R, Mahesh M, Singh A, Samanta R. An unusual association of Morning Glory Syndrome with chronic myeloid leukemia-Philadelphia chromosome. J Family Med Prim Care 2020;9:4456-9.

MGS. LE fundus was unremarkable [Figure 3L]. MRI brain and orbit revealed funnel-shaped excavation of the posterior globe on the right side [Figure 4a] and empty sella turcica [Figure 4b]. A diagnosis of RE MGS with sensory esotropia and latent nystagmus was made. The patient was treated for his allergic conjunctivitis with antiallergic eye drop Olopatadine (0.1%) 2 times/day and eye drop Carboxymethylcellulose (0.5%) four times a day for 4 weeks. Patient improved symptomatically and refused any other ophthalmic interventions.

Discussion

In 1970, Kindler described a bizarre congenital disc anomaly as "morning glory syndrome" as it resembles to the morning glory flower.[6] Recent studies have shown that primary mesenchymal abnormalities lead to aplasia of the lamina cribrosa and incomplete closure of the posterior scleral wall, which leads to MGS.[7] It is commonly unilateral with equal involvement of both eyes, although bilateral involvement may occur.[8] The prevalence of MGS has been reported to be 2.6/100,000.[9]

It is characterized by an enlarged, funnel-shaped excavation that incorporates the optic disc. The disc is enlarged, and orange or pink in color within a surrounding area of peripapillary chorioretinal pigmentary changes. White glial tuft is seen at the centre of the disc. The blood vessels are increased in number and curve as they emerge radially from the disc like petals on a flower as opposed to the usual central branching pattern. Depending on the size of perippapillary chorioretinal involvement, the term "macular capture" is described when the macula gets incorporated into the excavation.[7,10]

In addition to the abnormal disc, there may be serous retinal detachments, high refractive errors, strabismus and amblyopia. Serous retinal detachments can occur in 30% of individuals.[11] Mechanical and hemodynamic changes at the border of the optic disc may predispose to the development of the choroidal neovascularization.[12] Esotropia has a higher incidence than exotropia.[13] Although strabismus surgery and treatment of anisometropic amblyopia is recommended and may result in some improvement in vision, it is rare to see dramatic improvement. The visual prognosis is usually poor, in the range of 20/100 to 20/200. Moyamoya disease is associated with MGDA, retinal vascular occlusion, visual field defects caused by ischemia or hemorrhage, optic disc abnormalities, etc.[14]

Congenital choanal atresia is a rare craniofacial defect due to the misdirection of neural crest cell migration.[15] Some girls with MGDA have PHACE syndrome, which includes posterior fossa malformations, facial hemangiomas, arterial anomalies, cardiac anomalies, and eye anomalies.[16,17] All patients of MGDA should

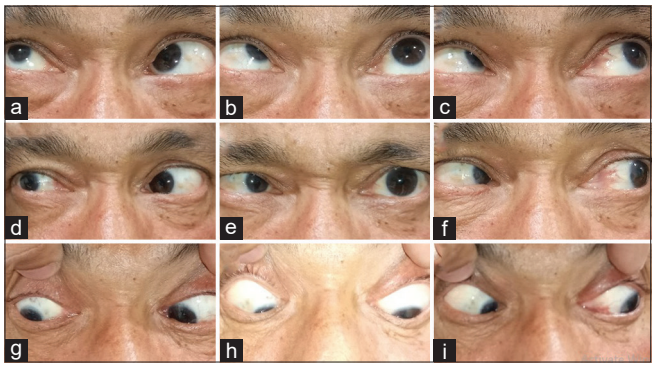

Figure 1: Nine gaze extraocular image (a-i) showing right esotropia (in primary gaze, (e) and right inferior oblique overaction (more evident in levoelevation, (c)

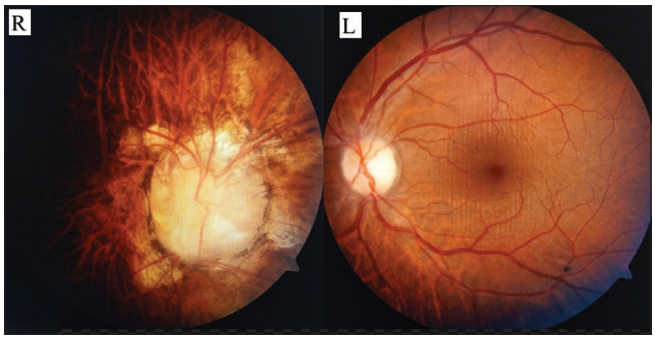

Figure 3: Fundus photo of the right eye showing large disc with excavated posterior scleral opening. The blood vessels are increased in number and arranged radially from the disc with peripapillary hyperpigmentation in clumps suggestive of MGS. Left eye fundus was unremarkable

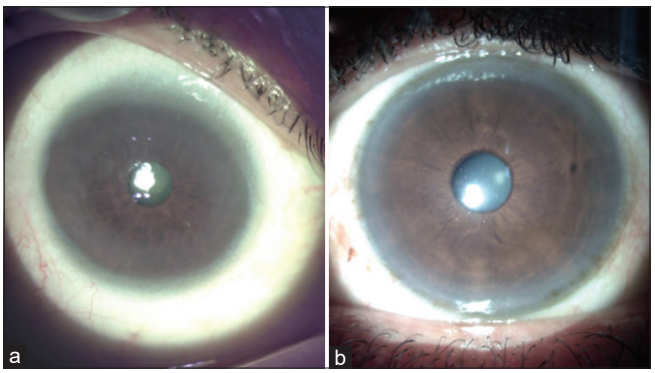

Figure 2: Anterior segment slit lamp images on diffuse illumination of right eye (a) and left eye (b) showing microcornea in the right eye (a)

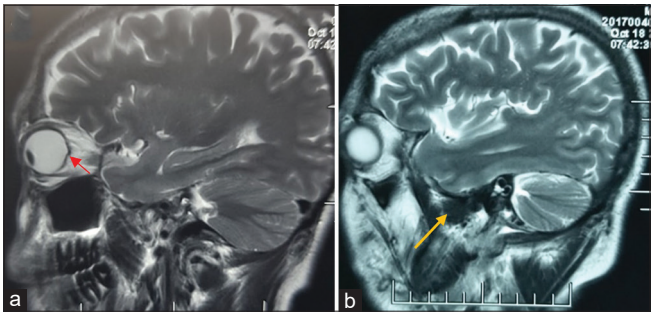

Figure 4: MRI brain images (4a & 4b): (a) Coronal section showing funnel shaped excavation of the posterior globe on the right side (red arrow). (b) sagittal section showing empty sella tursica (yellow arrow)

preferably undergo MRI brain, magnetic resonance angiogram (MRA), and timely referral to the appropriate subspecialists.

CML accounts for 15–20% of leukemias in adults with a median age at presentation of 50 years. They have varied symptoms at presentation ranging from asymptomatic to systemic symptoms such as fatigue, weight loss, abdominal fullness, and bleeding episodes. Ocular manifestations at the presentation in patients with leukemia vary from 9% to 77.8%.[18]

Ophthalmic involvement in leukemia can be classified into two major categories: (1) primary infiltration has three patterns of presentation: anterior segment uveal infiltration, orbital infiltration, and neuro-ophthalmic signs such as optic nerve infiltration, cranial nerve palsies, and papilledema and (2) secondary involvement is usually the result of hematological abnormalities of leukemia such as anemia, hyperviscosity, thrombocytopenia, and immunosuppression.[19,20] All these can lead to retinal or vitreous hemorrhage, infections, and vascular occlusions.[21] There are no reported cases of MGS in association with CML-PC.

In our patient, we found a typical large disc with an excavated posterior scleral opening and a white glial tuft at the centre suggestive of MGS. Additional features included microcornea, nystagmus, and esotropia, CML-PC and empty sella on MRI brain. CML is caused due to rearrangement of the genetic materials causing an abnormal fusion gene. On the other hand, although no specific genetic factor could be identified in the etiopathogenesis of MGS, it is found to be associated with several other systemic abnormalities. Hence, we believe that coexistence of MGS with CML-PC in the index patient, may be beyond mere association and some unknown genetic factors may be responsible for the causation. The present case also highlights the need of comprehensive ophthalmic evaluation in patients diagnosed with CML-PC and also implicates need for detailed systemic evaluation in patients diagnosed with MGS. Primary care physicians must be cognizant of these ocular abnormalities and refer to ophthalmologists timely, even when the patients present with minor ocular ailments.

Declaration of patient consent

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

Statement of ethics

Informed consent was obtained from the patient for publication of this report and any presented images.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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