



Unilateral High Myopia with Anisometropic Amblyopia

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ABSTRACT

Unilateral high myopia is a very rare entity which is usually missed leading on to severe amblyopia. Anisometropic amblyopia is due to higher degree of refractive error in one eye compared to the fellow eye due to form and vision deprivation. It is the second most common type of amblyopia next to strabismic amblyopia. We report two cases within a family with unilateral myopia with anisometropic amblyopia. Both the cases were missed in early childhood as there were no major signs or symptoms. An underlying genetic defect maybe responsible for this condition and needs further evaluation.

KEYWORDS : unilateral myopia, anisometropic amblyopia.

CASE REPORT:**Case 1**

A 62 year old male presented to the OPD for routine eye check up. History taking revealed defective vision in OD which was identified at the age of 30. There was no other ocular history. On ocular examination, eyes appeared orthophoric. Visual acuity was recorded as follows. OD-4/60 with ph 6/60, OS-6/6, NV OU- N36. Automated refraction done with Canon full autorefractometer R-F showed OD -5.50/±, OS +0.25/+0.25 @75°. Wet retinoscopy done after dilatation with 0.5% tropicamide eye drops showed against the movement reflex neutralized at -6.50 DS in OD and ± in left eye. Near vision correction was OU- ADD +2.50 DS improved to OD N12, OS N6. Distant vision in OD did not improve with acceptance. Unilateral high myopia with anisometropic amblyopia OD was noted. Dilated fundus examination using direct ophthalmoscope in OD appeared distorted and magnified. Slit lamp biomicroscopy with 90 D and indirect ophthalmoscopy with 20D revealed a normal myopic fundus with minimal tessellations. Peripheral examination was normal. Fundus of OS was normal.

Axial length and keratometry were measured to differentiate the cause between axial and refractive myopia. Axial length measured using Sonomed Ascan 300+ shows OD- 23.52mm and OS- 23.49mm ruling out axial myopia. Keratometry done with Bausch and Lomb manual keratometry showed OD K1-42.50D, K2- 42.00D, OS K1-43.00D, K2-42.50D. Hence a diagnosis of lenticular myopia was arrived. The patient was given best glasses for near vision only.

Family history was elicited and one of the two daughters of the patient had similar ophthalmic complaints. History and examination details are below.

Case 2

A 32 year old female, complaints of defective vision in OD diagnosed at 25 years of age. Vision OD-6/24 with ph 6/12p, OS-6/6, near vision OU=N6. Automated refraction showed OD- -2.00/-0.25 @95°, OS ±/-0.25@80°. Retinoscopy showed against movement reflex in OD neutralized at -1.50DS, OS ±. Acceptance by patient in OD -1.50DS 6/12, OS 6/6. This patient also showed unilateral myopia with anisometropic amblyopia of mild form. Axial length in OD-23.03mm, OS-23.15mm. K value was OU K1-43.75D, K2-43.25D. Best glasses were prescribed.

Discussion:

Myopia is defined as a type of refractive error wherein the parallel rays of light coming from infinity are brought to focus in front of retina with accommodation being at rest. A myopic eye is a strong eye. It may be due to increase in axial length or increased curvature of cornea or lens¹. Low myopia ($\leq 2D$) is noted in 29% of general population and moderate myopia (2-6D) is found in 7% and they are mostly bilateral. Unilateral high myopia³ is a rare condition which can be easily missed in childhood. Uncorrected unilateral myopia invariably results in amblyopia.

Assymetric myopia is either due to differential growth of eyeball or difference in the combined refractive power between two eyes. Sorsby et al⁵ concluded that increased axial length was the major cause of anisometropic myopia. The less common refractive myopia maybe due to lens subluxation, coloboma or cataract. Rosenthal et al⁶ found the associated clinical findings with unilateral myopia as staphyloma, pigmentary disturbances or cataract. Other associations noted were medullated nerve fibres and optic nerve hypoplasia.

Underlying genetic defect is considered in this condition due to higher prevalence of high myopia in children born to high myopic parents and Mendelian inheritance pattern has been reported in certain families with high myopia. Hence further genetic study is needed in such patients to better understand the pathology.

Anisometropia is the unequal total refraction between two eyes. Anisometropia² of $>4 D$ is not tolerated and leads onto amblyopia. Amblyopia is more common in anisohypermetropia where even 1-2 D of hypermetropia leads to amblyopia, whereas anisomyopia does not cause amblyopia even upto 3D. Unilateral high myopia ($\geq 6D$) causes severe amblyopia and it is due to form and vision deprivation as well as abnormal binocular interaction due to unequal foveal images. Strabismus maybe frequently associated with amblyopia.

There is a need for increased awareness in the society about unilateral refractive errors and effective implementation of school screening programmes to avoid missing this condition in childhood and thereby preventing amblyopia.

Amblyopia treatment is usually not addressed in adults. Recently repetitive transcranial magnetic stimulation has been temporarily associated with improved vision in amblyopic eyes in adults. This is done by application of rapidly changing magnetic fields to head with hand held coil. Further analysis and research is needed for it to be accepted as treatment modality.

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