



## Pediatric Low Vision Management in Case of Myopic Maculopathy Case Study

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### Abstract

A pediatric case of macular myopathy is described. His best corrected visual acuity was -13.50/-1.00 x 40 with vision 6/24 in the right eye while for the left eye subjective acceptance was -12.75/-0.50 x 50, 6/18. Several visual and adaptive aids can help people regain or maintain their independence so that the child can continue integrated education. Pediatric Low Vision Management in case of progressive condition like Myopic Maculopathy should be an integrated approach of low vision aids and rehabilitation including vocational training.

**Keywords:** Myopia; Retinopathy of Prematurity (ROP); Myopic Maculopathy

### Introduction

Myopia that is pathological is often referred to as high, degenerative, or malignant myopia. It describes a situation when people have axial lengths that are greater than a specific cutoff (typically 6.50 or 26 mm), a corresponding refractive error (of at least -5.0 diopter) and which is accompanied by characteristic pathological changes [1,2]. Pathological myopia usually starts in childhood between 5 and 10 years of age and progresses until the third decade or even later. Myopic maculopathy is a complex disease that comprises atrophic, tractional and neovascular changes that lead to vision loss [1,2]. Myopic macular degeneration is one of the main causes of irreversible blindness in certain regions of the world [3,4], becoming an important problem particularly in East Asia [2]. In Japan, this degenerative disease accounts for 12.2% of severe

vision loss [2]. Retinopathy of prematurity (ROP), a proliferative vitreoretinopathy that affects premature infants, is one of the main cause of blindness in children around the world [5,6]. The number of newborns worldwide who are at risk for ROP has been rising as the incidence of premature deliveries rises and survival rates boost as a result of improvements in neonatal care. Premature children are more likely than full-term children to develop myopia later in life, especially if they have retinopathy of prematurity (ROP) [5-7]. Myopia prevalence increases proportionally as degrees of prematurity and ROP severity increase. According to estimates, there are 1.5 million visually impaired children worldwide. While the prevalence of pediatric visual insufficiency has been estimated to be around 0.7 per 1000 children, it varies globally. These children, 66% of whom are Asian, number 0.25 million in India [7].

## Case Description

A 10 year old male child was diagnosed with myopic maculopathy since 3 months. His parents gave the history that he had complaint of increasing vision loss since last 6 months. He was diagnosed with myopia since one year of age. They also revealed high myopia in younger daughter and history of stage 2 retinopathy of prematurity at time of birth. Both parents were myopic. He had difficulty in seeing blackboard and managed studies by copying from friend.

The evaluation suggested that the Visual acuity with old glasses was 6/60, in right eye and 6/60+1 in the left eye. The Previous glass prescription for the right eye was -11DS and left was -10.50DS. The Net retinoscopy was found to be -13.50/ -1.00 x 40 in right eye and in left eye -12.75/-0.50 x 50. The Subjective acceptance was -13.50/-1.00 x 40 with vision 6/24 in the right eye while for the left eye subjective acceptance was -12.75/-0.50 x 50 , 6/18. Near Vision BE N10 @ 40 cm, N6 @ 15cm with efforts.

Functional vision assement was done followed by the refractive correction and positive findings were, both eyes central scotoma 10 degree measured with amsler chart and Confrontation test for both eyes normal. In both eyes Anterior segment was normal.

Posterior segment evaluation for both eyes showed, High myopic fundus with disc 0.5 cd, posterior staphyloma present, tessellated background. Thus the diagnosis of myopic maculopathy was confirmed.

Low Vision aid trial was given based on the magnification requirement calculations for distance and near. As per the requirement the distance magnification was 3x. SO a 3x Monocular handheld telescope – taught spotting, fixation and tracking. He was comfortable to read 6/6 target.

For near, as per the requirement 1x magnification was needed, so the trial of +4D near addition was tried near vision N6, but due to closer working distance patient has no significant difference. With an aim to keep hands free for ease of near reading and writing so tried higher add and With +5.00DS near addition- patient had no significant difference. Thus For prolonged reading 2x dome magnifier was tried, patient was comfortable reading N4 print.

Apart from optical devices, Non optical devices – reading stand for prolonged reading and writing task to maintain posture. Thus a final prescription- constant wear glasses, 3X monocular telescope for distance, 2 x dome magnifier for prolonged reading, reading stand for prolonged reading. Patient was advised for sitting on first bench and proper illumination at school, explained about availability of large print books and audio books if needed. The child was explained to keep flash along for difficulty in mobility in dark. Referred to vocational training at the nearest rehabilitation centre.

## Discussion

With increased incidence of ROP, low vision and blindness due to its complications has also increased. In the present case, due to high myopia at such an early age, the quality of vision may hamper the education of the child.

With increasing complications, the medical field is has also made advancement in managing those. Newer modalities of Myopia control including orthokeratology lenses could have been helpful to the child in early stages of myopia.

Accurate refraction and low vision therapies help visually impaired children, especially those with genetic or congenital ocular defects, improve their vision and participate in inclusive education.

A child's ability to interpret facial expressions and learn to predict people's behaviour might be hampered by visual impairment, which can exacerbate social isolation. Children with limited vision are also said to have a higher frequency of mental health issues. Giving low-vision children the tools they need to practise self-advocacy will help them advance their independence and get beyond challenges they will inevitably face throughout their lives.

School going children should be prescribed low vision with utmost care as major issues is adaptation due to cosmetic problems. Another problem observed in developing countries is children with progressive ocular conditions leading to low vision are directly shifted to braille and rehabilitation, whereas providing them with low vision aids may help in independent living and continuing education in the normal schools.

Through vision rehabilitation treatments that educate them how to use their remaining vision more effectively, children with limited vision can enhance their quality of life. Several visual and adaptive aids can help people regain or maintain their independence. When possible, integrated education for visually impaired children is now preferred. Low vision aids are an excellent way to provide visual rehabilitation, according to numerous research [9-11].

Non Optical low vision aids always play an supportive role in management of Low Vision, in this case, apart from the magnification devices, using of extra illumination also enhanced the contrast thus increasing quality of vision in child.

Recent studies suggests, electronic magnifications are better in case of progressive disorders. In this case, the electronic magnifiers were not preferred, though it would work for both distance and near as, child had limited requirements – only for studying and higher magnification was not needed.

Need of increased availability of low vision services is observed. Earlier the diagnosis, better management and can save the child from being dependent on a sighted guide.

## Conclusion

Pediatric Low Vision Management in case of progressive condition like Myopic Maculopathy should be an integrated approach of low vision aids and rehabilitation including vocational training.

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