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Case Report

A unique solution to improve an amblyopic child's adherence to patching

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ABSTRACT

Amblyopia should be treated in early ages to have better outcomes. Stimulation of suppressed eye and depriving light stimulus to the good eye is the main principal of the amblyopia treatment. Adherence to the patching for the treatment of amblyopia in children remains challenging. This could be due to poor cooperation of child or ill-fitting patch. Younger children can be motivated to mimic cartoon figures to improve their adherence to patching. Amblyopia treatment is a team work of parents and optometrist who not only select the mode of management but improve the acceptance of child for patching. We present a child with mild anisometropia and hypermetropia-induced esotropia and amblyopia who was non-compliant to patching. An innovative idea by the parents using a Ninja Turtle patch on the prescribed spectacle was very well accepted by the child and both esotropia and amblyopia improved within four months of the patching treatment. The vision in the affected eye improved from 20/200 to 20/20 with refractive error correction and patching. We share this low-cost child-friendly patching technique that parents invented that can be used to improve adherence to patching by young children during amblyopia therapy. This parent's innovation enabled to improve adherence and thus address amblyopia in patched eye and regain vision.

Keywords: Amblyopia, Eye-patch, Squint

INTRODUCTION

Amblyopia is defined as blunting of vision in eye. This could be due to a number of underlying causes like underdeveloped macula, media opacities not making clear image of outer world, uncorrected unilateral refractive error, nystagmus, etc.[1-3] Its early detection is essential but often challenging. A child till attains age of 10 years, amblyopia treatment is shown to have positive and effective outcomes.[4] However, amblyopia needs to be treated in any age.[5] Stimulation of suppressed eye and depriving light stimulus to the good eye through occluding the good eye is the main principal of the amblyopia treatment. Adherence to the patching for the treatment of amblyopia in children remains challenging. This could be due to poor cooperation of child or ill-fitting patch. Younger children can be motivated to mimic cartoon figures to improve their adherence to patching. Amblyopia treatment is a team work of parents and optometrist who not only select the mode of management but improve the acceptance of child for patching.

We present a child with mild anisometropia and hypermetropia-induced esotropia and amblyopia who was non-compliant to patching.

CASE REPORT

A three-year-old boy presented to the clinic in 2016 with complaints of inward deviation of the left eye for one year. The parents provided the child's history. He had a

mild degree of inward deviation initially at 2 years of age followed by large angle deviation and decreased vision in one eye compared to the other. There was no history of high fever or systemic disease in childhood prior to developing squint.

The boy's parents and younger sister did not suffer from refractive error, strabismus, or nystagmus. The child was not attending the current kindergarten year. He enjoyed playing with blocks to build houses and animals but did not use a computer and rarely used a smartphone. The child was seen by an ophthalmologist and given spectacles. He used them for one year with no improvement in his vision or deviation.

On examination, his distance vision was 20/200 in the right eye and 20/20 in the left eye. An orthoptic workup while using his old spectacles showed a deviation of 25 prism dioptres by the Krimsky method. A cycloplegic refraction examination was conducted using 1% cyclopentolate eye drops. Refraction of the right eye was +4.50 + 1.25 X 100°. Refraction of the left eye was +3.75 + 1.00X85°. Both anterior segment and posterior segment examinations were within normal limits. A follow-up after two months of correction with the new glasses found that the esotropia improved but the vision in the left eye did not improve. To address amblyopia, daily patching of the right eye for four hours was prescribed. The child was non-compliant to conventional patching on the spectacles. The underlying causes of non-compliance included a lack of acceptance by the child, peer pressure, and poor vision in the eye. His father devised an innovative method to persuade his son to accept the patch. He made a hole in his daughter's elastic cotton headband on the right side of the spectacles to construct a patch covering the left side (Figures 1 and Figure 2).

Figure 1: Hairband with cartoon character that was used to occlude the good eye in the treatment of amblyopia.

The hairband had Al Sanafer Arabic cartoon characters on it. The father then showed his son the Ninja cartoon and explained how a Ninja Turtle uses the band on his forehead to cover his eye. The child was excited by this idea and accepted the innovative patch.

After daily patching the left eye (four hours per day) for two months, the vision improved in the boy's right eye to 20/40 with spectacles with steady binocular vision without strabismus. Two months later it had improved to 20/20 vision. After gradual tapering of patching (two hours daily for one month, one hour daily for one month, one hour every other day for one month, and then ceased), the child maintained 20/20 vision for 2 years of follow-up, (Figure 3).

Figure 2: The child using the spectacle covering his right eye with the occluding hairband to treat amblyopia and esotropia.

Figure 3: The child showing good alignment after six months of patching via the hairband over spectacles.

DISCUSSION

Patching or penalization to treat amblyopia has been used for decades.[6-8] Nonadherence to patching in children is a common barrier to achieving the desired outcome.[9,10] Depriving vision in children by patching their sighted eye is considered the main reason they resist occlusion. Reducing the duration of occlusion has improved adherence and is equally effective for treating amblyopia.[11] However, amblyopic children are resistant to accepting occlusion. Therefore, an aesthetically acceptable occlusion method would improve acceptance.

Parents play an important role in improving compliance with patching therapy. Tijam et al, previously documented innovative solutions to improve treatment compliance.[12] The parents' role also benefits the child in chronic lifestyle diseases.[13] In the present study, innovation by a parent to improve his child's adherence

to amblyopia treatment and the successful treatment outcome was notable for the healthcare professionals.

The advantages of the Ninja Turtle patch include the following: (1) the child enjoys patching because he/she can pretend to be a Ninja Turtles character and will not feel treatment pressure; (2) the bands are inexpensive (one or two bands are sufficient for the treatment period); (3) the bands are durable and can be easily cleaned via washing machine; and (4) the headband and patch can be easily made at home. The disadvantages of ordinary eye patches are not present in the new Ninja Turtle patch. These include (1) high cost, because one new patch is necessary every day (30 patches per month), and (2) some children develop allergies to the patch's adhesive glue. The new Ninja Turtle patch should be developed to be more effective and safe: (1) the elastic band in the back can be made adjustable to the size of the child's head, and (2) the side of the band covering the normal eye should be protected by a plastic shield to avoid direct pressure on the child's globe.

CONCLUSION

Use of innovative method of devising patch on recommendation of parent; one of the team member of amblyopia treatment of the child had improved child's adherence to proposed treatment and improved the vision in the affected eye. Patching complimenting correction of refractive error is liked by the child could be promoted to treat amblyopia.

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