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Research Article

CASE REPORT: VISION THERAPY - AN AID TO INTERMITTENT EXOTROPIA

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ABSTRACT

Background: Intermittent exotropia (IXT) is the most common form of strabismus, characterized by an intermittent outward deviation of the eye. Control of the intermittent deviation can vary throughout the day. The control depends on the overall health and attention of the patient. The importance of vision therapy approach in management of IXT is illustrated through this case. **Case report:** A 6-year-old female visited the vision therapy department in Sankara Eye Hospital, Bangalore with a complaint of occasional diplopia along with headache. However, after a complete binocular vision assessment she was diagnosed with intermittent exotropia (divergence excess type) and advised for 12 sessions of in-office vision therapy plan along with a home exercises. The patient showed significant improvement by the end of the 12 sessions. **Conclusion:** Vision therapy plays an important role in the management of intermittent exotropia. Patients suspected to have poor vergence should be referred to Optometrist for binocular vision examination and for a holistic approach in the management of the condition.

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INTRODUCTION

An unconsciously selective approach to utilize binocular vision wherein alignment of the eyes when binocular cues are useful and allowing an eye to deviate when there is little benefit from binocular vision is usually observed among patients with Intermittent exotropia¹. In these patients, nearpoint of convergence recedes¹. Though they find it easiest to fuse stereoscopic targets, there is a difficulty in maintaining the fusion as there is no intrinsic benefit to binocular vision². The goal of treatment is to improve the efficacy of the patient in maintaining straight eyes even when stereopsis is not available. Owing to the above purpose, vision therapy in these conditions follow a reverse order of stereoscopic to second degree to simultaneous perception targets with continual emphasis on holding posture and special attention to visual feedbacks¹⁻². Peripheral stereopsis using projected targets is the usual starting point of binocular treatment. The OEP model briefs that the effort needed to function at demanding near tasks creates a drive to converge at a plane closer than accommodation in turn exhibiting a esophoric shift at near creating a need to inhibit fusional convergence to maintain single vision³. This inhibition of convergence (or active divergence) is then carried over to distance activities resulting in myopia or divergence excess^{1,3}. The blue factor for near positive fusional vergence would be higher since base out prism permits convergence at a closer plane than

accommodation further leading to a reduced recovery point since the patient has been inhibiting fusional convergence¹. Plus lenses at near reduces the demand to converge closer than accommodate and inhibits the development of farpoint exophoria and myopia. An alternative theory is that a slightly high AC/A ratio produces excessive accommodative convergence in turn initiating a fusional divergence at near to maintain single vision. As most of the patients with divergence excess have poor oculomotor control, these skills are also trained along with fusion¹.

CASE REPORT

A 6year old female visited vision therapy clinic with a complaint of occasional diplopia and frequent observation of outward deviation of eye since one month. She had been wearing glasses for 3 years and a cycloplegic refraction was last done in September 2022 with Homatropine which revealed - 0.25D change in the cylindrical power for both eyes. She was under vision therapy for 1-2 years ago in France which relieved the symptoms for a while. Systemic medical history as well as history of trauma was ruled out for her. Developmental milestones were within normal limits till date. She was referred to our vision therapy clinic by the pediatric ophthalmologist for a complete binocular vision assessment.

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Evaluation

The findings of accommodative and vergence evaluation are summarized in Table 1. Distance tests could not be performed due to diplopia at distance.

Table 1 Findings in the first visit

Aided Visual Acuity (Distance): (M/O and B/O)	20/20
Aided Visual Acuity (Near): (M/O and B/O)	N6 at 35cm
Stereopsis	40 seconds of arc (Wirt circles)
Worth 4 Dot Test: Near Intermediate Distance	Fusion Diplopia Diplopia
PBCT: Distance Near	25 PD BI exophoria decompensating into exotropia 16 PD BI exophoria decompensating into exotropia The control of the deviation was found to be moderate (slow refixation with blink)
AC/A ratio	6:1 (Gradient method)
NPC Accommodative target Non-Accommodative target	25/30cm >40cm
Accommodative facility: (with +/- 2.00 Ds) OD OS OU	4 cpm (slow with + lens) 4 cpm (slow with + lens) 5 cpm (slow with + lens)
Vergence facility: (with 3pd BI and 12pd BO)	0.5 (difficulty with BO)

Diagnosis

Intermittent exotropia (divergence excess type)

Management

The diagnosis of the patient was informed to the parents and various modes of management were discussed and they were highly motivated to undergo vision therapy. A 12 day session management plan which included in-office/home therapies was decided for the child. The management plan included exercises for eye movements, vergence and accommodation in each session with emphasis on eye movements and vergence therapies. Her in-office vision therapy was clubbed with home exercise for object tracking and brock string. The in-office therapies are as follows:

Phase	Parameter worked on	Therapy
I - Days 1 to 6	Ocular movement	Modified Hart chart
		Marsden ball

	Vergence	Object tracking
		Computerized random dot stereopsis (Reverse order)
		Large eccentric circles
	Accommodation	Hart Chart
II - Days 7 to 12	Vergence	Brock string
		Computerized therapy: Stereopsis and Flat Fusion
		Vectogram
	Accommodation	Hart Chart
		Accommodative flippers

In Brock string, she was unable to appreciate physiological diplopia. However, with continuous efforts she was able to fuse and appreciate physiological diplopia and further maintain it for only for a few seconds. By 5-6 days of in-office therapy, her vergence improved with better performance in brock string and symptomatically the informant of the patient had reported a reduction in diplopia and frequency of visible deviation in her day-to-day life activities. By the end of the 12th session, she was able to complete BI 20prism and BO 20prism in Mother Goose vectograms and good jump vergence with brock string. A re-evaluation was scheduled for her in the next visit.

Re-Evaluation

The parameters after completion of phase 1 are summarized in Table 2. The mother of the patient reported that everyone in the family had noticed the significant decrease in the visibility of the deviation and that the girl is not complaining of diplopia anymore.

Table 2 Findings after completing phase 1

Worth 4 Dot Test: Near Intermediate Distance	Fusion Fusion Fusion
PBCT: Distance Near	18 PD BI exophoria decompensating into exotropia 16 PD BI exophoria decompensating into exotropia
NPC: Accommodative target Red filter	8 cm break with recovery at 10cm 7cm break with recovery at 10cm
Accommodative facility: (with +/- 2.00 Ds) OD OS OU	6 cpm 7.5 cpm 6.5 cpm
Vergence facility: (with 3pd BI and 12pd BO)	8 cpm (equal with both)

Advice

The improved parameters were reported to the parents. They were informed that further therapy is needed for maintenance of these parameters so as to make sure that the condition doesn't regress. So, they were advised to continue of in-office therapy along with home therapy.

DISCUSSION

Intermittent exotropia (IXT) is the most common form of exotropia. There is a controversy over the best method to manage intermittent exotropia⁴ which means that there are many ways to manage the same like guided observation, patching, minus lenses, prisms surgery and vision therapy, all of which are effective, or no one single treatment is always effective⁴. Various studies have reported the value of vision therapy in improving the control of IXT⁵⁻¹¹ with a success rate of 60-90%. One particular study showed that vision therapy is effective in improvement in both operated and unoperated IXT patients in a private practice environment¹². Through this case report we want to signify the importance and effectiveness of vision therapy in management of IXT. Some reports also stress on prescribing over-minus which can further result in growth in the line of stress due to stress in the visual system resulting in poor peripheral awareness, postural changes and fatigues¹². Therefore, this study focuses on improving the condition with optimum correction along with vision therapy.

CONCLUSION

The approach in the current case showed that vision therapy has a quick and good efficacy in improving IXT. A good control over the deviation developed with no regression in the condition. There was a decrease in the frequency and magnitude of exotropia along with an improvement in fusional ability. Therefore, vision therapy can be preferred to manage intermittent exotropia.

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