

## Why Plus not Minus - A Case Report on Refractive Accommodative Esotropia

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Accommodative Esotropia is the type of deviation of eyes or squint which is basically due to accommodation reflex. There are various types of accommodative depending upon different parameter's such as refractive error, amount and type of squint, age, AC/A ratio and utmost important refraction and vision with follow ups. Considering these factors practitioner can get to the right diagnosis and can start the right treatment having good improvement in vision as well as decrease in the ocular deviations. In Refractive accommodative esotropia giving full cycloplegic treatment is one of the best treatments for better improvements in vision. Follow up of patient can also lead us to the correct diagnosis in early case we can get confused between refractive accommodative esotropia and infantile esotropia, one with a follow ups can lead us if the deviation or the amount of squint decreases or gets ortho with spectacles we can diagnose the case with Refractive accommodative esotropia and if the deviation remains with glasses and without glasses we can diagnose it with infantile esotropia, in which surgery is the only treatment options for that. So a correct and diagnosis and a correct treatment can give a good results.

**Keywords:** Accommodation; Accommodative Esotropia; Refractive Accommodative Esotropia**Introduction**

The term "accommodative esotropia" refers to an eye convergence deviation brought on by the accommodation reflex. More than half of all childhood esotropias are caused by it [1].

It can be classified into 3 forms: (1) refractive, (2) non-refractive, and (3) partially accommodative or decompensated.

All three versions share the following traits:

- Onset typically occurs between 6 months and 7 years of age, with a 2.5-year average.
- Initially intermittent, then with time becoming consistent
- Usually brought on by trauma or sickness
- Commonly connected to amblyopia

- In older children, it might be related to diplopia, but it later vanishes as a suppression.

**Refractive accommodative Esotropia**

Uncorrected hyperopia, accommodative convergence, and inadequate fusional divergence are the three elements that make up the mechanism. Uncorrected high hyperopia causes greater convergence because of which the accommodative effort to create a clean retinal image. Esotropia develops if the patient's fusional divergence is weak and easily corrected. If fusional divergence amplitudes are small or if sensory variables affect motor fusion, poor fusional divergence may result. Despite having lower degrees of hyperopia, patients with substantial anisometropia run the risk of developing refractive accommodative esotropia [2].

**Figure 1:** Pathophysiology of Refractive Accommodative Esotropia.

In most cases, acquired intermittent or persistent esotropia precedes the development of refractive accommodative esotropia. Although children between the ages of 2 and 3 are most affected, refractive accommodative esotropia can occasionally affect infants as young as 1 year old. The child's eyes are sometimes straight, according to the parents, but when they are sleepy or trying to focus up close, one or both child's eyes may cross inward. Younger children may first exhibit increased rubbing or squinting of the eyes. Children who are older may express asthenopia symptoms including headaches or diplopia. The average cycloplegic refractive error in refractive accommodative esotropia is +4.75 D, the most effective cycloplegic is cyclopentolate, however in patients with dark irides, atropine, which has a longer acting cycloplegic action, may be needed. But ranges between + 1.5 and +7.0 D [3].

### Treatment

The mainstay of treatment is spectacle correction in refractive accommodative esotropia. The full hyperopic correction based on the cycloplegic refraction is initially prescribed. This is true for both refractive variants of accommodative esotropia with juvenile and infantile onsets [4]. There is some urgency in starting treatment because delaying it could lead to fusion ability loss, amblyopia development, and stereopsis loss [5]. There are two significant parental counselling points: It is necessary to wear glasses all the time. When children use glasses just occasionally, their accommodation is never totally relaxed, and their vision becomes hazy if they return to wearing their hyperopic glasses on a regular basis. Esotropia will worsen when the youngster is not wearing glasses following the start of sight correction. Appropriate counselling is crucial prior to therapy because parents

frequently blame the increased esodeviation on the introduction of spectacles. This is due to the youngster becoming acclimated to a much reduced accommodative effort after beginning full-time use of glasses. However, once the glasses are taken off, the youngster will have to exert more accommodative effort than they did before the prescription for glasses, which will result in a larger angle.

### Case History

A two-year-old male child came to our pediatric and squint clinic of Laxmi Eye Institute on Jan 15<sup>th</sup>, 2022, with a chief complain of inward movement of the left eye noticed in the last 3 month and were informed by his parents. The birth history was normal. It was a full-term Cesarean delivery and the birth weight at the time of birth was 3000 Gram. There was a history of immediate cry. And the developmental milestone was also normal. On ocular Examination, unaided vision was "follow and fixate to light" in both eyes and on dry retinoscopy we got +5.00 D Spherical in both eyes and in Wet Retinoscopy we got +7.00 D spherical. On subjective refraction we gave the full cycloplegic refraction on first visit. It is shown Table 1. In torch light examination everything was within normal limits as shown in Table 2.0.

### Vision and refraction

| Vision and Refraction | Right eye | Left eye  |
|-----------------------|-----------|-----------|
| Unaided               | FFL       | FFL       |
| Dry retinoscopy       | +5.00DSPH | +5.00DSPH |
| Cyclo retinoscopy     | +7.00DSPH | +7.00DSPH |
| Acceptance            | +7.00DSPH | +7.00DSPH |

**Table 1:** Vision and Refraction.

### Torch light examination

| Torch light examination |                     |                     |
|-------------------------|---------------------|---------------------|
|                         | Right eye           | Left eye            |
| Anterior segment        | Within normal limit | Within normal limit |
| IOP                     | Dig n               | Dig n               |
| Lens                    | Clear               | Clear               |
| Posterior segment       | Within normal limit | Within normal limit |
| Cup Disc Ratio          | 0.2: 1              | 0.2: 1              |

**Table 2:** Torch Light Examination.

On squint workup we got that facial symmetry was there as it is one of factor for pseudo-Strabismus and the ocular alignment, we got 20-degree left esotropia on Hirshberg corneal reflex test. The ocular motility was full in all direction. On Modified krimsky test we got 40 PD of deviation.

The plan of management for first visit was to give full optical correction (Cycloplegic refraction).

The differential diagnosis is Refractive accommodative Esotropia and Infantile Esotropia.

### Follow Up 5 months

On follow up the subject was the sub was comfortable with glasses and there was inward deviation without glass. And we advised new glasses in view of scratches over glass.

Patient was ortho with glass. As the patient was ortho with glass and without glass there was esotropia seen, as our differential diagnosis say it can be either Refractive accommodative Esotropia or Infantile Esotropia. In infantile esotropia the deviation will not decrease after wearing glass and In infantile esotropia the deviation as mostly greater than 40 prism diopter and the refractive error will also be less than +2.5 D in this age group, and if esotropia reduces with subjective correction and the refractive error is more than +2.5 D then we can conclude that it is a case of Refractive accommodative Esotropia.

### Results and Discussion

The main mistake in treating childhood esotropia is inadequate management, which can cloud the diagnosis and result in poor care [6]. When it comes to the initial prescription for glasses or the under correction of hypermetropia during follow-up, authors frequently fail to adequately explain how they treat the condition. It is frequently ambiguous whether full cycloplegic refraction is recommended as the first course of treatment and whether it is repeated in cases with persistent esotropia or distance-near disparity. In these circumstances, incomplete correction of hypermetropia results in higher rates of distance-near discrepancy as well as higher rates of deterioration. The doctor must constantly be aware of the fundamental defect to correctly treat accommodative esotropia. When linked with esotropia, preferred practice pattern guidelines recommend a spectacle prescription

for hypermetropia of +1.50 D. They also emphasize the need for a subsequent cycloplegic refraction when esotropia is not controlled by the wearer's present glasses [7]. According to previous research, hypermetropia does, on average, start to decline around age 7, but only little. In this study, the typical infant had hypermetropia of 4.28 D at birth, which rose to 4.93 D at age 7. This child would be over 11 years old before hypermetropia had once again reached 4.28 D, with a mean annual decline of 0.17 D after age 7. It seems unlikely that the hypermetropia would continue to reduce in this typical youngster in a way that would allow the accommodative esotropia to resolve [8]. These findings suggest that under correcting for hypermetropia does not result in a quicker reduction. The degree of hypermetropia present at the time of diagnosis is the most crucial factor in predicting the resolution of accommodative esotropia.

### Conclusion

In patients with congenital esotropia we should rule out whether it is infantile esotropia or accommodative esotropia. We should do all the pre optometric workup to find the right diagnosis and can give the possible outcome with the treatment. In Accommodative esotropia also we will have to find out which of the type it is refractive, non-refractive, and partially accommodative or decompensated. For this we should have a dilated cycloplegic refraction and calculate AC/A ratio. In non-refractive type we have AC/A ratio high. Then we can give the best treatment so that the best visual outcome can come in congenital patients. Then we suggest giving full refractive correction in refractive accommodative esotropia.

### Conflict of Interest

There is no financial interest, or any conflict of interest exists.

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