Accommodative Esotropia

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Accommodative Estropia (Acc ET)

Definition:
An esotropia a caused by and increased Accommodative effort Or an abnormally high AC/A ratio.

Accommodative Esotropia

- Strabismus, in general, is thought to be inherited in 30% to 70% of cases.
- Some studies indicate that the most likely mode of transmission is autosomal dominant with incomplete penetrance.
- The hallmark of accommodative esotropia is the onset of an intermittent esodeviation between ages 1 and 3 years in a neurologically normal child.
- It is elicited only when accommodative innervation is stimulated.

Continue accommodative ...

- Accommodation function may determine esodeviations due to dysfunction of one or more factors acting on it, such as AC/ A ratio, fusional vergence, or hyperopia.
- Usually, during the genesis of an accommodative esotropia, the abnormal behavior of these factors in not isolated but is combined in variable degrees.

Types of Accommodative esotropia

- Refractive Acc ET (normal AC/A Ratio)
- Nonrefractive Acc ET (high AC/ A ratio)
- HypoAccommodative ET
- Partially Acc ET
Pathophysiology of Accommodation and convergence

- Normally, a unique and clear image at near is perceived owing to the double mechanism of accommodation and convergence.
- The accommodation determines that the object of fixation is focused on the retinas, whereas convergence causes them to fall on corresponding retinal areas to avoid diplopia.

Refractive accommodative esotropia (fully accommodative, normal AC/ A ratio)

Continue refractive ...

- Orthotropia with hypermetropic glasses.
- Most patients pass through a stage of intermittent ET, intermittent diplopia, asthenopia, closure of one Eye when doing close work

Treatment of refractive Acc ET

- The goal of treatment is to reduce ET to within 8 PD or less of manifest deviation.
- This angle allows the development of at least peripheral fusion and possibly the Expansion of fusional amplitudes.
- The prognosis for restoration of normal binocular function in refractive accommodative esotropia is usually excellent if normal binocular functions existed before the onset of the deviation.
- Full correction of the hypermetropic refractive error, determined by cycloplegic refraction, is usually all that is required initially for rehabilitation.
- Surgical treatment ?
- Ambliopia management

Nonrefractive accommodative ET (convergence XS, High AC/ A)

Definition:
- Nonrefractive accommodative esotropia is defined as an esotropia greater at near than at distance fixation, unrelated to an uncorrected refractive error, and caused by an abnormally high AC/ A ratio in the presence of a normal near point of accommodation.
- Nonrefractive accommodative esotropia occurs in patients with emmetropia, hypermetropia, or myopia; however, moderate degrees of hypermetropia are encountered most frequently.

Accommodative convergence/ accommodation (AC/ A ratio)

- The AC/ A ratio expresses the convergence magnitude induced by each accommodation diopter.
- Usually, the AC/ A ratio is constant during the first years of life and is unique for each individual and probably hereditary.
- The amount of accommodative convergence is determined by the required accommodation (depending on the distance of fixation) and the refractive error.
- AC/ A ratio appears stable up to presbyopic age and even beyond
Methods for determination of the AC/A
- Hypermetropic method
  \[AC/A = PD^+ \frac{\Delta s - \Delta u}{D}\]
  \[AC/A = 6^+ \frac{-8 - (-2)}{3} = 4 \Delta / D\]
- Gradient method
  \[AC/A = \frac{\Delta s - \Delta u}{D}\]
  \[AC/A = \frac{8 - (-2)}{2} = 5 \Delta / D\]

Continue method ...
- Fixation disparity method
- Haploscopic methods

Nonrefractive accommodative esotropia
- The etiology is unrelated to the underlying refractive error but is closely linked with an abnormal synkinesis between accommodation and accommodative convergence- the effort to accommodate elicits an abnormally high accommodative convergence response.
- If motor fusion can cope with the increased convergence tonus at near fixation, an esophoria results.
- If motor fusion is insufficient, nonrefractive accommodative esotropia will become manifest.

Treatment of Nonaccommodative ET
- Amblyopic management
- Optical management
  * full cycloplegic refraction
  * bifocal, Executive type
- Pharmacologic management

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<thead>
<tr>
<th>Pharmacology</th>
<th>Pilocarpine</th>
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<tbody>
<tr>
<td>Phospholine iodide</td>
<td></td>
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<tr>
<td>0.12% twice daily</td>
<td>4% four times per day</td>
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<tr>
<td>0.06% twice daily</td>
<td>2% four times per day</td>
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<tr>
<td>0.06% daily</td>
<td>2% twice daily</td>
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Continue treatment ...
- Surgical management

Continue treatment ...
* bilateral medial rectus muscles recession
* slant MR recession
* posterior fixation suture
Hypo Accommodative ET
(convergence XS, normal AC/ A)
Definition:
- Hypoaccommodative esotropia is defined as an esotropia greater at near than at distance fixation, unrelated to an uncorrected hypermetropic refractive error and caused by excessive convergence from and increased accommodative effort to overcome a primary or secondary weakness of accommodation.

Continue Hypo ...
- Small refractive Error
- Remote near point of ACC
- Small deviation at distance
- Large deviation at near
- Temporary blurring of vision after switching form near to distance vision

Treatment of Hypo Acc ET
- Full cycloplegic refraction
- Using addition for near vision
- Surgery

Partially Accommodative esotropia
Definition:
- An esotropia is partially accommodative when accommodative factors contribute to but do not account for the entire deviation.

Continue partially ...
- There is essential infantile ET and an Accommodative Element becomes superimposed on the deviation as the child grows older
- In other cases a nonaccommodative element develops after initial alignment of the eyes with glasses.
Treatment of Partially Accommodative esotropia

- Ambliopia must be eliminated
- Full refractive error correction
- Surgery for only the nonaccommodative component

### Accommodative Esotropia

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<th>Near</th>
<th>Treatment</th>
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<td>Refractive accommodative esotropia (Fully accommodative)</td>
<td>ET</td>
<td>ET</td>
<td>Optical</td>
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<tr>
<td>Nonrefractive accommodative esotropia (Convergent XS high AC:A ratio)</td>
<td>Orthotropic</td>
<td>ET</td>
<td>Optical, miotics, surgery</td>
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<tr>
<td>Hypoaccommodative esotropia (Convergent XS normal AC:A ratio)</td>
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<td>ET</td>
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<tr>
<td>Partially accommodative</td>
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<td>Accommodative treatment, surgery</td>
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