Accommodative Esotropia

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Course Objectives

1. Understand the pathophysiology of accommodative esotropia
2. Be familiar with the clinical signs and presentation of accommodative esotropia
3. Treat accommodative esotropia
Pathophysiology

- 3 mechanisms involved:
  - uncorrected hyperopia
  - accommodative convergence
  - poor fusional divergence

- High amounts of uncorrected hyperopia leads to accommodation in order produce a clear image. The accommodation leads to increased convergence and crossing.
History

- Onset between 6 months and 7 years (usually 2-3 years old)
- Often becomes noticeable as child gains interest in viewing things
- Initially intermittent but can become constant
- Parents report that eyes cross when child focuses on things, particularly at near
- Can be precipitated by illness or injury
Clinical Presentation - visual acuity

- Important to evaluate for amblyopia
- HOTV is the preferred method in young children who are able to cooperate (typically 2.5 years to 4 years old)
- Snellen acuity is most accurate
- Always patch one eye when testing visual acuity
Clinical Presentation - alignment

- Children with accommodative esotropia typically have esotropia measuring from 15 to 30 PD
- Cover testing provides most accurate measurements. Use Krimsky if have to.
- Need to measure alignment at near and at distance
- Check stereopsis and fusion
- Check extraocular motility to rule out abduction deficit, which would point to different etiology of the esotropia
Clinical Presentation - refraction

- An accurate refraction with full cycloplegia is essential for the diagnosis and treatment.
- Use cyclopentolate 1% and neosynephrine 2.5%.
- Allow at least 30 minutes for full cycloplegia.
- If unable to obtain good cycloplegia, can have patient return for atropine refraction - have parents use atropine daily for 3 days and then return for refraction.
Classification of Accommodative Esotropia

1. Refractive
2. Non-refractive
Refractive Accommodative Esotropia

- Hyperopia averages +4.00 (range +3.00 to +8.00)
- Children learn to accommodate to correct their hyperopia which leads to convergence. Depending on their divergence fusional ability, they may develop an esotropia.
Refractive Accommodative Esotropia - Initial Treatment

- Treat with full time wear of full cycloplegic refraction.
- The earlier the treatment the better prognosis
- Undercorrection of the hyperopia or poor glasses wear can hurt the development of binocular vision.
- Glasses must be worn full time and parents must be educated about the importance and the logic behind wearing the glasses.
- Compliance is usually not a problem. Cyclopentolate blurring at home can be used to encourage glasses wear.
Refractive Accommodative Esotropia - Follow up exams

- Follow up 6-8 weeks after initial exam
- Check vision with glasses
- Check to make sure glasses are made correctly
- Check alignment at near and distance, with and without glasses
- Check stereopsis
Refractive Accommodative Esotropia - Treatment

- Continue glasses if alignment good (esotropia less than 8 PD)
- Typically will see younger kids every 6 months
- If alignment continues to be good, can often gradually reduce hyperopic correction, particularly when children are 11-12 years old.
- Can evaluate by checking alignment with -0.75 lenses over the glasses.
- Never be in a rush to reduce hyperopic correction - main objective is to control the crossing and give good vision.
- Biggest factor in weaning off glasses is lower levels of baseline hyperopia(< +3.00).
Refractive Accommodative Esotropia - Treatment

- If significant crossing with glasses, recheck cycloplegic refraction with atropine daily for 3 days.
- Update glasses if more hyperopia uncovered
- If still crossing, consider prisms, fusional training, and/or surgery for the non-accommodative component of the partially accommodative esotropia.
Bifocals and accommodative esotropia

- Add if crossing at near but distance is under control.
- Typically, esotropia above 8 PD at near is worrisome
- Make sure bifocal bisects the pupil.
- Avoid progressives and no line bifocals in young children.
- Can often be eliminated over time (teenage years).
Strabismus surgery for accommodative esotropia

- Consider if significant crossing despite maximal hyperopic correction.
- Patients may have both accommodative and non-accommodative esotropia.
- Typically, crossing greater than 12 PD will affect fusional development.
- Surgery is done to adjust the non-accommodative component but patient will still need glasses to relax the accommodative component.
- Usually do bilateral medial rectus recession based on the average amount of esotropia with and without glasses.
Non- Refractive Accommodative Esotropia

- High accommodative convergence to accommodation (AC/A) ratio with low hyperopia
- AC/A ratio
  - Lens gradient method: (deviation with lens – deviation without lens)/power of lens
  - Heterophoria method: interpupillary distance (cm) + [(near deviation – distance deviation)/ accommodative demand]
- Generally present if near ET is greater than distance by more than 10 PD
Non- Refractive Accommodative Esotropia

- Typically have a lower amount of hyperopia (+2.00)
- Patients may present with difficulty reading, tiredness when focusing, or diplopia at near
- Treat with hyperopic correction with bifocals (+3.00)
- In older/reliable children, can have them use glasses as needed for near work if no significant esotropia at distance
Miotics

- Phospholine iodide 0.125% QD is most commonly used
- Cause miosis and accommodation, so less accommodative effort required to view image and the amount of reflex convergence is reduced
- Can be used in patients with high AC/A ratio and minimal hyperopia or those children uncooperative to glasses wear.
- Interacts with the anesthetic agent, succinylcholine, and prolong paralysis with general anesthesia
- Can cause brow ache, cramping, iris cysts, and potential retinal detachments
Refractive surgery and accommodative esotropia

- May be possible once refractive error becomes stable
- Higher amounts of hyperopia may not be amenable to refractive surgery
- Most recent data indicates that patients who have refractive surgery can achieve good alignment.
- Patients with residual hyperopia and poor fusional divergence would be most at risk for recurrent esotropia and continued need for spectacle correction.
Thank you

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