# 6.8.2. Esodeviations (II): Accommodative Esotropia

- Management
  - Refractive accommodative esotropia
    - correction of full amount of hyperopia
      - cycloplegic refraction
        - if binocular fusion is maintained, refractive correction can later be decreased to 1.00–2.00 D less than full cycloplegic refraction
          - possibly aid in emmetropization
      - measured hyperopia usually increases until age 5–7 years before it starts to decrease
        - if esotropia with glasses increases, cycloplegic refraction should be repeated
    - significant delay in initiating treatment following onset of esotropia increases likelihood that a portion of esodeviation will fail to respond
    - amblyopia
      - may respond to spectacle correction alone
      - treatment with occlusion or penalization may be needed
        - if amblyopia persists after a period of spectacle wear
    - full-time wear of the glasses is important
    - refractive correction can only help control the strabismus, not cure it
      - esotropia, without glasses, may increase initially after correction is worn
    - strabismus surgery
      - if patient fails to achieve an ocular alignment within fusion range (8Δ–10Δ) with correction
        - partially accommodative esotropia
      - recheck cycloplegic refraction before proceeding with surgery
    - refractive surgery
      - experimental
      - for older patients who continue to need refractive correction
    - references
  - High AC/A esotropia
    - Bifocals
      - plus spectacle lenses for hyperopia
      - bifocals further reduce or eliminate the need to accommodate for near fixation
      - executive or 35-mm flat-top style
        - top of the segment should bisect the pupil
        - vertical height of the bifocal should not exceed that of the distance portion of the lens
      - lowest plus power needed (up to +3.00 D)
      - progressive bifocal lenses
        - used successfully in older children who know how to properly use bifocal spectacles
        - should be fitted higher than they are in adult lenses (at about 4 mm)
      - ideal response to bifocal glasses
        - restoration of normal binocular function (fusion and stereopsis) at both distance and near fixation
      - acceptable response to bifocal glasses
      - if some degree of sensory binocular cooperation or fusion is achieved, reduce the strength of the glasses to create a small esophoria
        - to stimulate fusional divergence
        - fusion at distance with <10Δ of residual esotropia through the bifocal at near (signifying the potential for fusion)
      - course
        - some children improve spontaneously with time
        - others can be slowly weaned from bifocals
          - reduce bifocal power in 0.50–1.00 D steps
          - started at ≈ age 7 or 8 and should be completed by age 10–12 years
          - if a child cannot be weaned from bifocals, surgery can be considered
    - Long-acting cholinesterase inhibitors
      - echothiophate iodide
      - act directly on ciliary body, facilitating transmission at myoneural junction
        - reduce central demand for accommodative innervation
          - decrease accommodative convergence
      - systemic and ophthalmic complications
        - iris cysts
        - cataracts
        - increased response to depolarizing muscle relaxants
      - no longer commercially sold in US
    - Surgery
      - controversial
      - medial rectus muscle recessions ±posterior fixation or pulley fixation
      - may allow for discontinuation of bifocals and use of contact lenses
      - risk of overcorrection at distance is small (<10%)
      - prism adaptation for near deviation
      - preoperative use of prisms to determine the maximum deviation
    - Observation
      - many patients show a decrease in near deviation with time
        - mechanism
          - ultimately develop binocular vision at both distance and near fixation
          - increase in the fusional divergence
          - natural decrease of hyperopia
          - natural decrease of high AC/A ratio
      - some ophthalmologists observe near deviation as long as distance alignment allows for development of peripheral fusion
  - Partially accommodative esotropia
    - strabismus surgery for the deviation that persists while patient wears full hyperopic correction
    - purpose of surgery is to produce straight eyes with glasses—not to allow the child to discontinue wearing glasses altogether
    - in older patients
      - refractive surgery can be considered to both reduce the hyperopic refractive error and improve the ocular alignment
- Introduction
  - deviation of eyes associated with activation of accommodative reflex
  - characteristics
    - onset typically between 6 months and 7 years of age
      - as early as age 4 months
      - averaging 2½ years
    - often hereditary
    - usually intermittent at onset, becoming constant
    - sometimes precipitated by trauma or illness
    - frequently associated with amblyopia
    - diplopia possible
      - especially with onset at an older age
      - usually disappears with development of a facultative suppression scotoma in the deviating eye
- Types
  - Refractive accommodative esotropia
    - pathogenesis
      - uncorrected hyperopia
        - forces the patient to accommodate to focus the retinal image
      - accommodative convergence
      - insufficient fusional divergence
        - cannot compensate for the increased convergence tonus
    - average of +4.00 D of hyperopia
    - between 20Δ and 30Δ
      - ≈ at distance and near fixation
  - High accommodative convergence/ accommodation (AC/A) ratio esotropia
    - excess convergence tonus for the amount of accommodation
    - deviation is present only at near or is much larger at near
    - average +2.25 D
      - can occur with high or normal degrees of hyperopia, emmetropia, or even myopia
  - Partially accommodative esotropia
    - show a reduction in angle of esotropia when wearing glasses but have a residual esotropia
    - pathogenesis
      - 1. decompensation of a pure refractive accommodative esotropia
        - more likely if there is a long delay in refractive correction
      - 2. an initial nonacccommodative esotropia subsequently develops an accommodative component
- Evaluation
  - visual acuity
    - vision of 2 eyes can be equal
    - amblyopia can be present
  - versions and ductions may be normal
    - ± overelevation in adduction or dissociated strabismus
  - deviation should be measured using an accommodative target at distance and at near
  - alternate cover testing on initial examination typically reveals an intermittent comitant esotropia
    - larger at near than at distance

Ophthalmology Mind Maps/Arman Mashayekhi, MD