# 6.9.2. Exodeviations (II): Intermittent Exotropia

- most common type of exodeviation
- Clinical Characteristics
  - onset
    - < 5 years
    - may develop during the first year of life
      - must be differentiated from
        - intermittent strabismus that is common in the first 1–2 months of life
        - constant infantile exotropia
        - spontaneously resolves
  - precipitating factors
    - visual inattention
      - drowsiness on awakening
      - daydreaming
    - fatigue
      - late in the day
    - stress
      - during illness
  - exposure to bright light often causes a reflex closure of 1 eye
    - "squint"
  - larger for distance
    - may be difficult to elicit at near
      - most parental interactions with young children occur at near
  - can be associated with small hypertropias, A and V patterns, and overelevation and underelevation in adduction
  - untreated intermittent exotropia may progress toward constant exotropia
    - tropic episodes occur at lower levels of fatigue and last for longer periods
  - children <10 years usually do not experience diplopia when they are tropic
  - normal retinal correspondence and good binocular function remain when the eyes are straight
  - amblyopia is uncommon unless
    - intermittent exotropia progresses to constant or nearly constant exotropia at an early age
    - another amblyogenic factor, such as anisometropia, is present
- Evaluation
  - history
    - age of onset
    - change in frequency
    - circumstances under which the deviation is manifest
  - grading of control of exodeviation
    - 1 Good control
      - manifests only after cover testing, and the patient resumes fusion rapidly without blinking or refixating
    - 2 Fair control
      - manifests after fusion is disrupted by cover testing, and the patient resumes fusion only after blinking or refixating
    - 3 Poor control
      - manifests spontaneously and may remain manifest for an extended time
    - Newcastle Control Score
      - quantitative
  - prism and alternate cover testing
    - fixation distances of 6 m and 33 cm
      - near deviation=far deviation
        - factors
          - tenacious proximal fusion
            - slow-to-dissipate fusion mechanism at near
            - pseudo-high AC/A ratio
            - repeat near alternate cover test, after 30–60 minutes of monocular occlusion
              - will eliminate tenacious proximal fusion
              - ≈ near and distance measurements after occlusion confirm tenacious proximal fusion
              - will not eliminate high AC/A
              - near deviation will remain greater than distance deviation
          - high AC/A ratio
            - occurs much less commonly in exotropia than in esotropia
            - repeat alternate cover test with +3.00 D lenses at near or −2.00 D lenses at distance
              - will eliminate effect of high AC/A
              - ≈ near and distance measurements with lenses confirm high AC/A
    - far distance measurement at ≥30 m
      - may uncover a latent deviation or bring out an even larger one
  - sensory testing
    - excellent stereopsis
    - normal retinal correspondence
      - when the eyes are aligned
    - suppression
      - when the exodeviation is manifest
    - diplopia
    - uncommon
  - references
- Classification
  - 1 Pseudodivergence excess exotropia
    - most common form
    - distance deviation > near deviation
      - this difference becomes minimal after monocular occlusion or with +3.00 D lenses at near
  - 2 Basic exotropia
    - distance deviation ≈ near deviation
  - 3 True divergence excess exotropia
    - least common form
    - distance deviation > near deviation
      - deviation does not equalize after monocular occlusion or with +3.00 D lenses at near
  - Convergence weakness exotropia
    - near deviation > distance deviation
- Treatment
  - Nonsurgical management
    - Correction of refractive errors
      - myopia
        - correction of even mild myopia may improve control of exodeviation
      - astigmatism
      - hyperopia
        - mild to moderate degrees of hyperopia are not routinely corrected
        - marked hyperopia (>+4.00 D or >+1.50 D hyperopic anisometropia)
          - cannot sustain accommodation, resulting in blurred retinal image and manifest exotropia
      - additional minus lenses
        - 2.00–4.00 D beyond the actual refractive error
          - to stimulate accommodative convergence
        - may cause asthenopia in school-aged children
        - effective as a temporizing measure to promote fusion and delay surgery
          - if initial overcorrection results in control, prescription can be gradually tapered and surgery may be avoided
    - Occlusion therapy
      - amblyopia
        - patching may improve control of exotropic deviations
      - no amblyopia
        - part-time patching of dominant (nondeviating) eye
        - alternating daily patching in absence of a strong ocular preference
        - can be an effective treatment for small-to moderate-sized deviations
          - particularly in young children
        - improvement is often temporary
          - many patients eventually require surgery
    - Active orthoptic treatments
      - deviations of ≤20 Δ
        - techniques
          - antisuppression therapy/diplopia awareness
            - loss of ability to suppress diplopia may be quite bothersome
          - fusional convergence training
        - a with patching, minus lenses, and surgery
        - reported by some authors to have a long-term success rate comparable to surgery
    - Prisms
      - base-in prisms
        - promote fusion
        - can cause a reduction in fusional vergence amplitudes
          - seldom used for long-term management
  - Surgical treatment
    - indications
      - documented progression toward constant exotropia
        - more frequent manifest deviation
          - >50% of the time
        - decreased control
        - decreased distance stereoacuity
        - no consensus exists regarding specific indications
      - best sensory outcomes are probably achieved with
        - motor alignment <age 7
        - strabismus duration <5 years
        - while deviation is still intermittent
    - types
      - pseudodivergence excess exotropia
        - symmetric recession of both lateral rectus muscles
      - basic intermittent exotropia
        - may do better with
          - combined lateral rectus muscle recession and medial rectus muscle resection
          - larger lateral rectus muscle recessions than those used for patients with pseudodivergence excess
      - true divergence excess exotropia
        - increased risk of developing near exodeviations after lateral rectus muscle recessions
          - may require bifocal glasses if near exodeviation is associated with a high AC/A ratio
    - smaller exodeviations
      - unilateral lateral rectus muscle recessions
        - might reduce amount of lateral rectus muscle recession on each side by 1 mm
        - some believe that usual quantity of surgery may result in overcorrection if exotropia in each side gaze is less than that in primary position by ≥10Δ
    - botulinum toxin
      - multiple injections are commonly needed
    - references
  - Postoperative alignment
    - esotropia
      - small-angle exotropia in immediate postoperative period is desirable
        - less likely to develop recurrent exotropia
        - may experience diplopia during the time they are exotropic
        - conversion to monofixation, with subnormal stereopsis, may occur
          - some ophthalmologists prefer to delay surgery in young children in whom good preoperative visual acuity and stereopsis might be exchanged for a small-angle esotropia and decreased stereopsis postoperatively
            - delaying surgery too long could allow permanent suppression to develop and decrease long-term stability following surgical correction
      - indications for treatment
        - exotropia persists beyond 3–4 weeks
        - exotropia develops after 1–2 months
      - treatment methods
        - base-out prisms
        - patching
        - corrective lenses
          - if significant hyperopia is present
        - bifocals
          - for a high AC/A ratio
        - surgery
          - delay of a few months is recommended before reoperation
            - unless deficient ductions suggest a slipped or lost muscle
            - spontaneous improvement is common
          - unilateral or bilateral recession of the medial rectus muscle
          - advancement of the recessed lateral rectus muscles
        - injection of botulinum toxin
    - residual exodeviation
      - mild to moderate with good fusional control
        - observation
      - persistent exotropia
        - commonly worsens over time
        - base-in prisms
        - patching
        - optical management
        - surgery
          - if deviation progresses
            - re-recession of the lateral rectus muscles
            - resections of the medial rectus muscles
            - injections of botulinum toxin
    - monofixational exotropia
      - constant exodeviation <8Δ
      - decreased stereopsis

Ophthalmology Mind Maps/Arman Mashayekhi, MD