Efficient and Effective Diagnosis and Treatment of Strabismus and Amblyopia

Course Outline (detail)

I. Introduction Clinical description of strabismus and amblyopia

A. Definitions

1. Strabismus – is an anomaly of binocular vision in which the visual axis of one eye fails to intersect the target of interest
2. Amblyopia – reduced vision in one eye not due to uncorrected refractive error of readily observable pathology

B. Rationale for evaluation

1. Prevalence ~5% of the general population
2. Treatment is effective
3. What the complete evaluation will do for the doctor
   a. valid diagnosis
   b. prognosis of functional correction
   c. appropriate treatment plan
   d. effective patient/parent communication
II. Diagnostic Examination Sequence

A. History

1. Age of onset of eye turn
2. Frequency – how often and under what conditions does the eye turn
3. Previous treatment – results
4. Patient/parent attitude about the eye turn – to what extent are they willing to seek treatment
5. Standard questions about family and health history

B. Determination of refractive error

1. Goal – max plus manifest – max plus cycloplegic
2. Methods
   a. Monocular static
   b. Mohindra – 50cm, subtract +1.25 from the sphere in dark looking at the retinoscope light
   c. Cycloplegic
      1. Dosage
         a) < 1yr, 0.5% proparacaine + 1/2% cyclopentalate X2 @ 5 min
         b) > 1yr, 0.5% proparacaine + 1% cyclopentalate X2 @ 5 min
      2. Scope after ~40 minutes on axis
      3. Tell patient about duration of the dilation ~24hrs

C. Visual acuity assessment

1. Snellen chart – flaws
   a. Unequal number of letters per line
   b. Spacing (contour interaction)
   c. Bias of doctor in assigning VA
2. Tumble E’s with interaction bars
3. HOTV
4. S-chart acuity

D. Monocular fixation

1. Definition of Eccentric fixation – anomaly of monocular vision in which the center of the fovea is not consistently used to fixate the center of the target of interest
2. Goal – measure the magnitude and unsteadiness of eccentric fixation
3. Method
   a. Visuoscopy
   b. Entoptic phenomenon

E. Evaluation of the ocular deviation

1. Direct observation
   a. Direction of the eye turn
   b. Cosmesis
   c. Facial asymmetries
2. Hirschberg test – 1mm = 20 Δ
3. Unilateral cover test
   a. Goal – determination of the presence or absence of an eye turn
b. Method
1. Best Rx
2. Threshold target consistent with the acuity in the poorer eye
3. Remember the measurement are contaminated by eccentric fixation

4. Alternate cover test
   a. Goal – determine the magnitude of the deviation
   b. Method

5. Comitancy
   a. Goal – determine whether the magnitude of the deviation remains the same in all fields of gaze
   b. Method
      1. versions
      2. ductions
      3. Hirschberg in different fields of gaze
      4. alternate cover test in difference fields of gaze
      5. Hess test

F. Determination of the state of retinal correspondence
1. Why is it important? It greatly effects the prognosis and treatment options
2. Goal – determine if the two foveas give rise to a percept in the same visual direction
3. Methods
   a. Hering-Bielschowsky after image test
      1. direct measure of the angle of anomaly (angular separation in perceived space of two foveal placed images)
      2. contaminated by eccentric fixation
   b. Comparison of the angle of strabismus (H) and the subjective angle of directionalization (S)
      1. both must be done at the same test distance and with the same target
      2. determine “S” by red lens test and a vertically dissociating prism

G. Sensory/Motor function
   Esotropic cases limited to those with NRC – correspondence is not a factor in exotropia
1. Goal – what is the sensory status when the motor deviation is neutralized with prism or motor fusion?

H. Conclusions

III. Treatment

A. General treatment sequence
B. Specific treatments for:
   1. Amblyopia
      a. Treatment goals
      b. passive treatment
      c. active treatment
      d. guidelines for continuing treatment
2. Exotropia  
   a. Treatment goals  
   b. passive treatment  
   c. active treatment  
   d. guidelines for dismissal  

3. Esotropia  
   a. treatment goals  
   b. passive treatment  
   c. active treatment  
   d. guidelines for dismissal  

IV. Conclusion