AMBLYOPIA: CAUSES AND TREATMENT

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I HAVE NO CONFLICTS OF INTEREST TO DISCLOSE.
AMBLYOPIA

- “Dullness of Vision”

- Commonly referred to as “lazy eye”

- Poor vision in an eye even though the retina and optic nerve are normal and even though the correct glasses are in place if needed.

- The eye cannot see because it has been “turned off” or suppressed by the brain.
AMBLYOPIA

- For normal visual development to occur both eyes must be presented with images that are equally clear and similar.
- Any factor that interferes with this process can result in amblyopia.
  - uncorrected refractive error
  - strabismus
  - visual deprivation
AMBYLOPIA

- Only children get amblyopia.
- If not treated in childhood, amblyopia results in permanent loss of vision.
- It is preventable!
AMBYLOPIA

- National Eye Institute (NEI)
  - The most common cause of unilateral vision loss in patient’s aged 20-70 is untreated amblyopia.
  - Amblyopia affects 2-3% of children in the United States
    - An estimated 6 million children with preventable vision loss.
AMBLYOPIA: RISK FACTORS

- Untreated refractive errors:
  - Asymmetric refractive error:
    - Anisometropia: condition in which the need for glasses differs between the two eyes.
      - Typical child has visual function that appears normal because the child sees well with the fellow eye.
      - Often detected when the child is old enough to undergo visual acuity screening.
  - Symmetric refractive error:
    - Large amount of refractive error (most commonly hyperopia) can cause bilateral amblyopia.
Strabismus

one of the most common forms

visual axes of the two eyes are misaligned and the patient develops a preference for one eye.

The deviating eye has a disparate image and the brain suppresses the vision development for that eye.
AMBLYOPIA: RISK FACTORS

- Visual deprivation
  - least common, but most serious form.
  - occlusion of the visual axis: cataract, ptosis, corneal opacities.
AMBLYOPIA

- Critical period
  - Time period at which the visual system is most sensitive.
  - From birth through the first decade of life.
  - Most vulnerable to visual deprivation during the first few months of life.
AMBYLYOPIA

Can your child see?
AMBLYOPIA

- Direct measurements of visual acuity using the eye charts commonly begin at age 4 in the primary care office.

- A 3-4 year old must be able to identify the majority of the 20/50 line with each eye to pass.

- A 5+ year old must be able to identify the majority of the 20/30 line with each eye.
AMBLYOPIA

- BEWARE!
AMBLYOPIA

- Bruckner test: or the red reflex test, uses the direct ophthalmoscope to obtain a red reflex simultaneously in both eyes.
AMBLYOPIA: INSTRUMENT BASED SCREENING.

- Photoscreeners test for risk factors that are known to cause amblyopia
  - Requires less attention from a child than formal visual acuity testing.
  - Visual screening with eye charts check actual visual acuity.
- AAP recommends: “When children reach 1-3 years of age, instrument-based screening, if available, can be employed and used thereafter at annual well-child visits until acuity can be tested directly.”
AMBLYOPIA: TREATMENT

- Correction of refractive error
- Penalization of the sound eye.
AMBLYOPIA: TAKE AWAYS

- It is preventable!

- It is critical that children undergo frequent age-appropriate vision screening, either by vision chart or instrument-based methods, in order to detect amblyopia.

- Children referred from a screening, and children with persistent concerns despite a “passed” screening, or children with family history of eye disease, should be referred for a prompt examination by an eye care provider specially trained in treating children.
WORKS CITED


http://www.aappublications.org/news/2015/12/07/Vision120715

STRABISMUS

= any misalignment of the eyes
  ~ 2-4% of all people.
STRABISMUS
WHICH DIRECTION IN THE MISALIGNMENT?

ESO: turning inwards
   Esophoria: tendency to turn in, usually controlled.
   Esotropia: constant misalignment
   Intermittent esotropia: intermittent misalignment.

EXO: turning outwards
   Exophoria: tendency to turn out, usually controlled.
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6 EXTRA-OCULAR MUSCLES (EOMS) PER EYE

1. **medial rectus (MR)**,
2. **lateral rectus (LR)**,
3. **superior rectus (SR)**,
4. **inferior rectus (IR)**,
5. **superior oblique (SO)**, and
6. **inferior oblique (IO)**.
HOW DO WE ASSESS STRABISMUS

- Assess Alignment
- Assess Movement of the eyes
HOW DO WE ASSESS STRABISMUS

- Assess Alignment
  - Are the eyes straight looking straight head?
    - If not
      - Describe the deviation/s
      - Measure deviation with prisms
Gross observation: Obvious misalignment

Corneal light reflex centration

In same place on eye? Eyes are straight

Might look crossed but really is straight

In different positions on eyes? An eye is misaligned

Left eye is subtly esotropic

Cover testing
Cover fixing eye and crossed eye shifts to pick up fixation
Gold standard test
- Prisms measure the amount of deviation.
- Important for surgical planning.
MOVEMENT TESTING

Test function of 6 EOMs by moving the eyes into 9 gaze positions
STRABISMUS: ETIOLOGY

- Eye movement is not limited:
  - This is the most common in kids.

- Eye movement is limited:
  - Cranial nerve palsy, Orbital process, Graves ophthalmopathy.
COMMON TYPES OF CHILDHOOD-ONSET STRABISMUS

- **Infantile esotropia**
  - Infantile esotropia begins at birth or during the first year of life. Infantile esotropia is also called congenital esotropia.
  - Crossing in a baby that doesn’t go away and gets more constant.
  - May run in the family.
  - Surgery is indicated.
Accommodative Esotropia

- Onset by between 2-6 YO
- Begins intermittent then constant
- May develop amblyopia in eye that turns in more
- Far-sighted specs keep the eyes straight
- May be familial
- **Intermittent exotropia**
  - Intermittent misalignment
  - Eyes are straight, then become XT, then pt blinks, and eyes go back to straight
  - XT episodes manifest more when the pt is tired, and at distance viewing (watching TV)
- Onset by age 2-4 years
- 75% progresses
  - XT seen more often in day
  - Operate then
STRABISMUS – REASONS TO TREAT

- Restore or encourage normal binocular function
  - Motor and sensory fusion
- Eliminate diplopia
- Eliminate torticollis
- Improve appearance
STRABISMUS - TREATMENT

Options:

No treatment

Glasses

Prisms

Surgery

Depends on cause, age, vision, complaints.
STRABISMUS SURGERY

- Can operate on all 6 intraocular muscles.

- Common procedures
  - Recession: weakening procedure
  - Resection: strengthening procedure

- Uncommon procedures
  - Oblique surgery
  - Transpositions
  - Reoperations
COMMON POST OP APPEARANCE

The End!
Strabismus powerpoint: Jane C Edmonds

www.aapos.org

Strabismus muscle surgery pictures: G. Vike Vicente

www.aapos.org