



Strabismus, Amblyopia & leukocoria

**Elham ALQahtani, MD.
Pediatric ophthalmology & Strabismus
Assistant professor, KSU**

Strabismus

- ❖ ocular misalignment .
- ❖ 2%-3% of children and young adults.
- ❖ Male=Female

❖ Causes of Strabismus:

1. Inherited pattern.
2. Idiopathic.
3. Neurological conditions
(CP, Hydrocephalus & brain tumors).
4. Down syndrome.
5. A congenital cataract , Eyes Tr.

Why we are concerned about strab ?

- ❖ **Binocular single vision.**
- ❖ **Double vision.**
- ❖ **Cosmetic.**

Consequences

❖ **Lazy eye (amblyopia) .**

❖ **Double vision.**

Tests for deviation

1.Hirschberg test :

1mm from pupil center=15PD or 7° .

2-Krimsky :

place prism on fixating eye until control reflex in deviated eye .

3.Cover test .

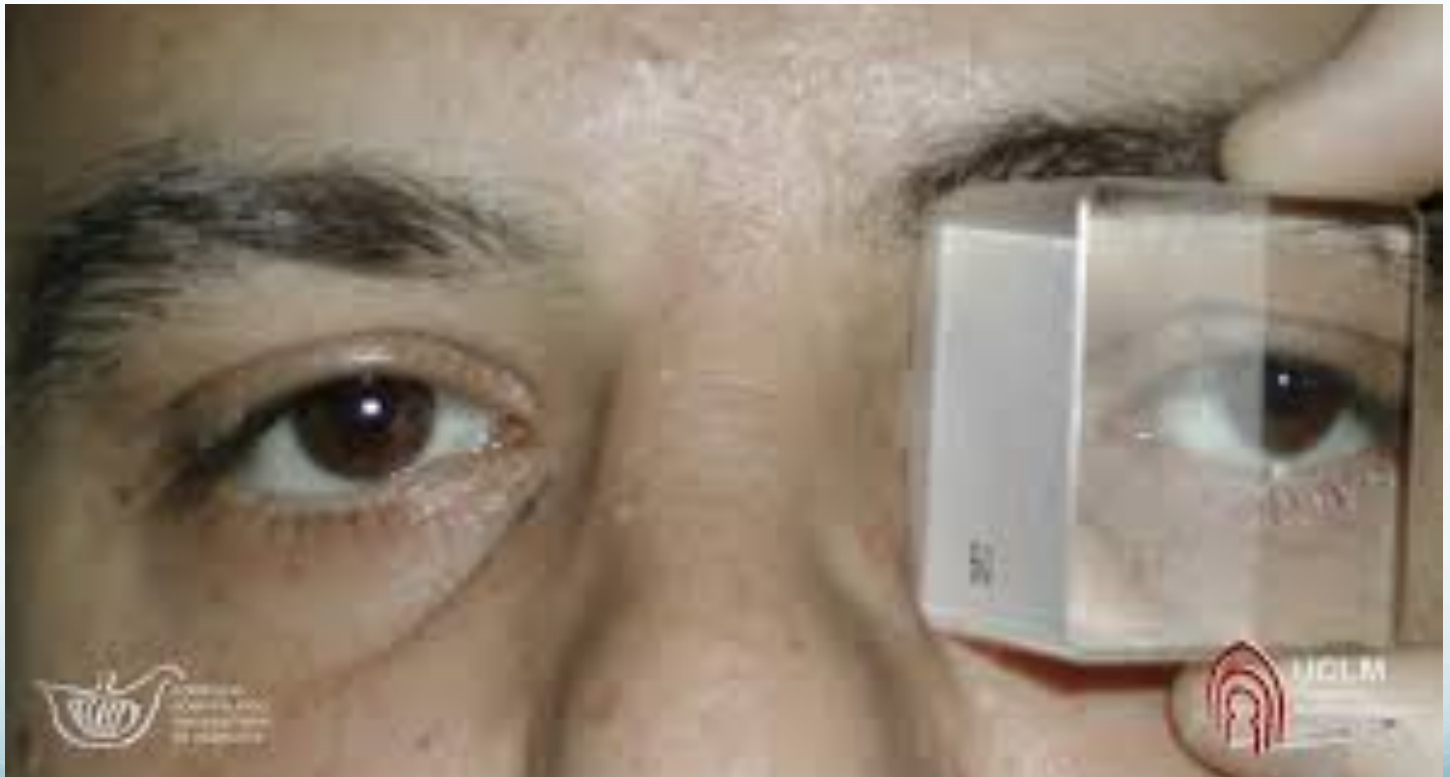
4.Prism cover test.

Hirschberg test



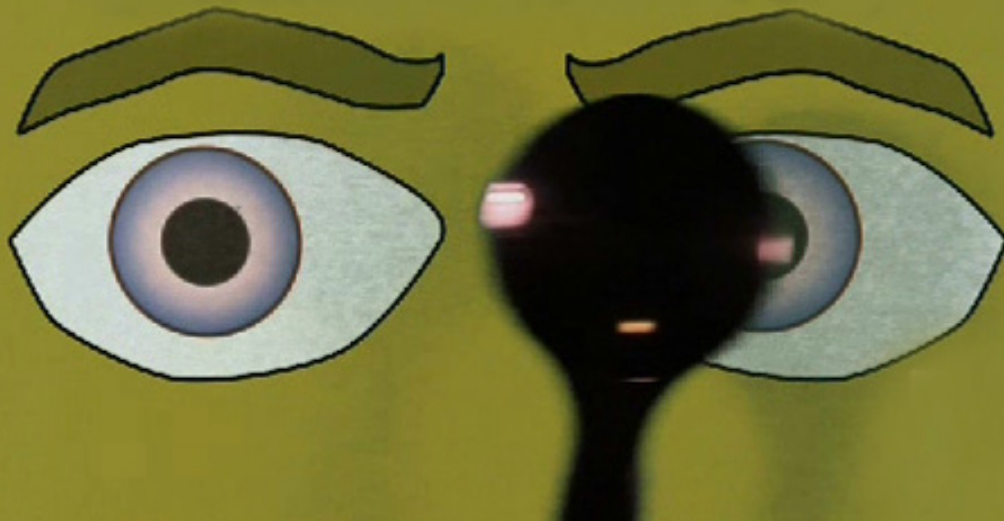


Krimsky test



Cover test

"cross-cover test"



Prism cover test



Pseudostrabismus

Pseudoesotropia is a condition in which alignment of the eyes is straight (also known as orthotropic); however, they appear to be crossed.

Pseudostrabismus



- a flat nasal bridge
- prominent epicanthal folds.

pseudostrabismus

A careful ocular examination (eg, pupillary light reflex, cover test) reveals that the eyes are straight.

Types of Strabismus

1. Commitant : XT or ET

Almost same angle in any direction of gaze .

2. Non-Commitant: XT or ET

angle change with direction of gaze(Paretic, restrictive).

Comitant strabismus

ET20

ET 25

ET30

ET25

ET30

Non-committant

ET 20

ET 10

ET 12

ET40

ET18

Types of strabismus

- **Esotropia (ET).**
- **Exotropia (XT).**
- **Hypertropia (HT).**
- **Hypotropia(HPO).**

Esotropia

1. Infantile (congenital) ET.

2. Accommodative ET:

a. hypermetropic (refractive)

b. high AC/A ratio.

c. partially accommodative ET.

3. Acquired non accommodative ET (DIVERGENCE paralysis).

4. Sensory ET.

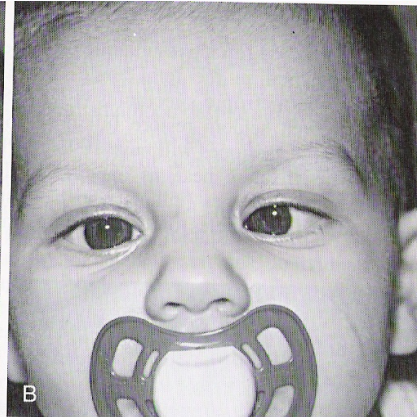
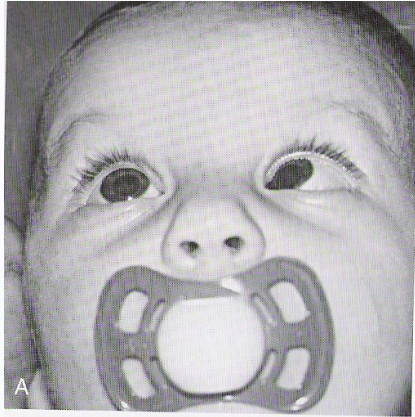
5. Cyclic ET.

Infantile ET

- 1. Large Angle.**
- 2. Small hypermetropia .**
- 3. Before age of 6months .**
- 4. Cross fixation (turning the face to fixate the eye contralateral to the target).**

Ocular association of infantile ET

- **DVD (dissociate vertical deviation) .**
- **IIOOA .**
- **Latent nystagmus.**
- **Smooth pursuit asymmetry(slow laging temp. on OKN).**
- **DHD(dissociate horizontal deviation) .**



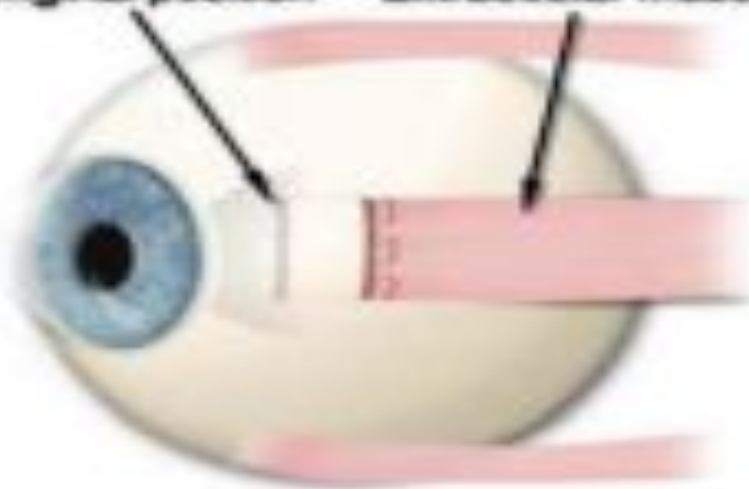
Treatment of infantile ET

- **Surgically by weakening the medial rectus muscles at age of 10-11 months to achieve monofixation syndrome.**
- **Prognosis: gross stereopsis .**

Muscle Recession Procedure

Original position

Extraocular muscle







Clinical example

A 4-month-old healthy child presents with a history of his eyes turning in most of the time, since about 8 weeks of age.

Examination:

ET for both distance and near 60 PD.

EOM is Full.

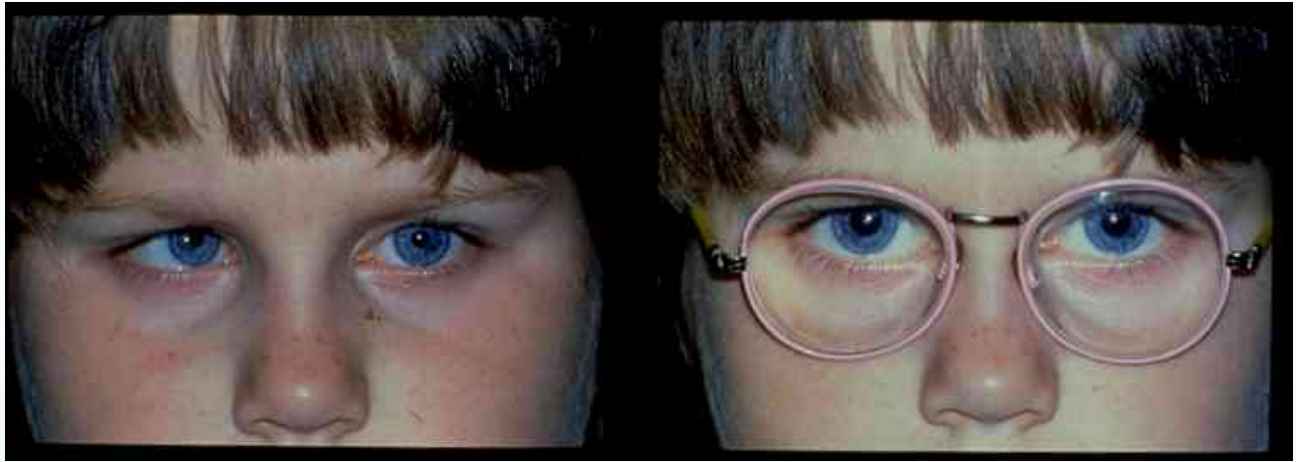
Cycloplegic retinoscopy is +1.25 D

Fundus :normal.

Acc ET

1. $>+2.00$ hypermetropia.
2. age $>6\text{mo}$ -7years (4yrs).
3. High risk of amblyopia.
5. Intermittent at onset then constant .
4. Corrected totally ($<10\text{PD}$ residual N+D) with glasses.





High AC/A ratio ET

- The accommodative convergence/accommodation (AC/A) ratio gives the relationship between the amount of convergence (in-turning of the eyes) that is generated by a given amount of accommodation (focusing effort).
- Esotropia with high AC/A ratio (also termed nonrefractive accommodative esotropia).







23 10:1



تقييم الابصار
ORTHOPTIC SHEET

PRESENT CONDITION:

4 y old having
ET

DATE: _____

Dsc V 20/30

Dcc V W

NYSTAGMUS

20/30
0

FIXATION

HEAD POSTURE

DEVIATIONS

Dsc 35

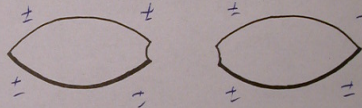
Dcc 10

Nsc 35

Ncc 25

Ncc + 3.00 10

ET



WORTH 4-DOT

STEREOPSIS

FUSION RANGE

CYCLOPLEGIC REFRACTION

OD

OS

ROTATIONS

OTHER TESTS

FUNDUS

OD

OS

WNL 81

COMMENTS:

Dx: ?

Signature: _____, M.D.

Signature: _____ Orthoptist

Date: _____

Treatment of highh AC/A



Figure 7: Bifocals bisecting the pupil

Partial acc ET

- **>10 PD residual for D+N with full hypermetropic correction.**

- **Treatment :**

Surgery Sx for the residual deviation .

Divergence paralysis

- ET at $D > N$.
- **MRI** : arnold chiari, pontine Tr.

Sensory ET

- **ET due to unilateral blindness.**
- **Treatment: Sx**

Cyclic ET

- **Very rare.**
- **Acquired(2-6yrs).**
- **Cycle between straight and ET.**
- **Treatment: if hypermetropia ~glasses**
if not hypermetropia ~ Sx

Exodeviation

- ❖ a horizontal form of strabismus characterized by visual axes that form a divergent angle.



XT Types

1. Intermittent exotropia X(T) .
2. Congenital XT.
3. Sensory XT.
4. Convergence insufficiency.

Intermittent exotropia

- **Acquired.**
- **Early childhood.**
- **Intermittently controlled by fusional convergence.**
- **Close one eye n the bright light.**



- This deviation may later progress to constant exotropia

Treatment

1. Surgical treatment.

**2. non surgical: alternate patching .
over minus.**

Indications of surgery :

1. poor control.
2. The deviation occurs more than 50% of time.
3. Lost distance stereopsis .

Types of X(T)

Basic

- XT D=N
- BLR weakening

Pseudo divergence excess

- Xt D>N
- Patch 30-60min
- XT D=N
- BLR weakening

True divergence excess

- XT D>N
- Patch 30-60min
- XT D>N
- R&R

Congenital XT

- **Very rare.**
- **Constant large angle**
- **Poor fusion prognosis**
- **High risk of amblyopia**
- **Associated with craniofacial abnormalities, albinism, CP.**
- **Tx: BLR Weakening.**

Sensory XT

- **Blind eye drift outward .**
- **SX.**



Convergence insufficiency

- Inability to maintain the convergence on objects approaching from D to N.
- C/O: asthenopia, diplopia .
- X or XT at N ,Stright at D.
- Remote near point of convergence (normal 5-6cm).
- Tx: orthoptic exercise.

Amblyopia

Amblyopia refers to reduced vision, uncorrectable with glasses or contact lenses, due to failure or incomplete development of the visual cortex of the brain.

Amblyopia

- VA is $<20/40$ or 2 lines below the good eye .
- 2 ~4%.
- Almost during visual immaturity till the 9th BD.
- Unilateral or bilateral.

Classification

Strabismus Amblyopia

Refractive Amblyopia

Occlusive :organic ,cataract

Idiopathic ,try to nystagmus

Criteria of Dx

- **VA < 20/40 OU or in one eye.**
- **FHx.**
- **Hx of visual deprivation during infancy .**

Treatment

- **Optical correction.**
- **PTO.**
- **Defocusing (penalization).**

Patching





Leukocoria







Leukocoria

- **Cataract .**
- **RB.**
- **PHPV**
- **COLOBOMA**
- **RD.**
- **Astrocytoma**
- **Coat's disease, uveitis .**

Thank you