Vertical strabismus and Cyclo – deviations

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classification

A-Depending upon constancy of deviation

- Hyperphoria
- Intermittent hypertropia
- Hypertropia

B- direction of deviation

in the non-fixing eye

Hypertropia

Hypotropia

Depend up-on comitance of deviation

I-comitant vertical deviations

-Induced(refractive)

-End result of long-standing -paralytic deviation

II-Incomitant vertical deviations

-Apparent oblique muscle dysfunction

-Paretic vertical deviations

-Restrictive vertical deviation

III. Dissociated vertical deviation (DVD)

Comitant vertical deviation

- Occur associated with horizontal deviation
- Types are
  - Hypertropia- non-fixating eye is higher than the fixating eye
- Hypotropia- vise-versa
- Etiology
  - Correction of unequal refractive error
  - Anomalous position of rest-anatomical
  - Convertion of incomitant paralytic hyperdeviation

treatment

1 Orthoptics- to eliminate suppression may be indicated prior to surgery

It is impossible to improve vertical fusional vergence through orthoptic training

2 prismotherapy- smaller than 10D can correct prism

hypertropia= 5pd BD

Hypotropia= 5pdBU

3-Surgical correction

Incomitant vertical deviation

1- apparent oblique muscle dysfunction-

i-inferior oblique overaction now term as *over-elevation in adduction (OEA)*

ii-inferior oblique underaction- now term as *under-elevation in adduction (UEA)*

iii- superior oblique overaction now term as *over-depression in adduction (ODA)*

Iv- superior oblique underaction-term as *under-depression in adduction (UDA)*

2-paretic vertical deviations

- Congenital unilateral superior oblique paresis
- Non-congenital superior oblique paresis
- Bilateral superior oblique paresis
- Monocular elevation deficiency (MED) old name Double elevator palsy
- Monocular depression deficiency (MDD)
- Superior rectus paresis
- Inferior rectus paresis
- Skew deviation

3- restrictive vertical deviations

Inferior oblique overaction

1 primary overaction of the inferior oblique muscle (PIOO)
   - Referred to as over-elevation in adduction
   - Due to mechanical or innervation causes or a combination of the two

2 secondary overaction of the inferior oblique muscle (SIOO)

   -Caused by paralysis or paresis of either its antagonist muscle (ipsilateral superior oblique muscle) or its yoke muscle

Clinical feature

1-Age of oneset - PIOO occurs by the age 2-3yrs

-SIOO can occur at any age

2-Bilaterality – PIOO B/L

while SIOO is occasionally bilateral

3- Upshoot or over-elevation of the eye in adduction-

primary as well as secondary inferior oblique overaction

- With the eyes in lateral gaze and the abducting eye fixing

4 Associated horizontal deviation in primary position

PIOO – comitant esotripai (more) or exotropia (less)

SIOO – not associated with any form of concnmitant deviation

5 Associated vertical deviation in primary position

PIOO- Absence or less than 5D

SIOO – 22D

6 head tilt – SIOO – only present

7 Associated excyclodeviation

SIOO – hess screen test, Maddox rod test, major amblyope or the Lancaster red-green

PSOO – Absence

Differential diagnosis

- Dissociated vertical deviation
- PIOO can be differentiated from the secondary inferior oblique overaction

treatment

- Inferior oblique weakening procedures
- Disinsertion
- Myectomy extirpation
- Recession
- Recession with anterior transposition

Superior oblique overaction

- Characterized by a downshoot of the eye in adduction

Etiology

1 primary overaction of the superior oblique muscle (PSOO)

-may be due to mechanical or innervational causes or a combination of the two

2 Secondary overaction of the superior oblique muscle- cause by –paresis or paralysis of either its antagonist muscle or its yolk muscle

Clinical features

-Unlike superior oblique muscle, isolated palsy in inferior oblique is not much known and so is the secondary overaction of the superior oblique muscle

-So, much so that all bilateral superior oblique muscle overaction can be considered “primary”

- Primary superior oblique overaction (PSOO)
- Secondary superior oblique overaction (PSOO)

1 Age of oneset- PSOO- 2-3 yrs

SSOO = either spontaneously or few weeks to months following paresis of ipsilateral inferior oblique muscle or contralateral inferior rectus muscle

2 PSOO – bilateral

SSOO- unilateral or some time b/l

3 Downshoot of the eye in adduction

4 Associated horizontal deviation in primary position

5-Associated vertical deviation in primary position

6 Head tilt -SSOO

7 Associated incyclodeviation

Treatment

1 superior oblique tenotomy

2 superior oblique lengthening by insertion

Dissociated Vertical Deviations

- Don’t follow the Hering’s law of ocular motility
- Since the upward drifting of the non-fixing eye os often associated with lateral deviation and excyclotorsion

Clinical features

1 Deviation – spontaneous occurrence pf vertical deviation in either eye

A day dreaming = manifest DVD

Fusion is interrupted by artificial means = latent DVD

2 association

-75% cases of essential infantile esotropia

-Usually diagnosed betw 2 to 5 yrs

-In infantile exotropia

-Excycloduction and latent nystagmus

4 laterality-frequently bilateral but rarely may be monocular

monocular dissociated hyperdeviation – presence of an intermittent exotropia

Frequently found that when fusion is broken and the eye is deviated, the deviated eye develops a small hyperdeviation

5 Binocular vision and sensory adaptation

suppression usually develops in pts with spontaneous DVD

- Absolute facultative central scotoma

Diagnosis

1 cover-uncover test
- Pt with unilateral manifest DVD
- In pt with alternate DVD
- In pts with latent DVD- present only when the eyes have been dissociated

2 Head tilt test- contralateral head tilt

(right eye increases with left head tilt)

3- Red glass test-

diplopia can be elicited in most pts with dark-red glass

4-Demonstration of bielshowsky phenomenon

5-mesurment of DVD

I. prism base-down under the occlude test

II. modified form of Krimsky test- used to measure DVD in pt who cant fix with deviating eye

III- An approximate grading pf DVD

1+ deviation = a slight deviation

2+ deviation = a small deviation

3+ Deviation = moderate deviation

4+ deviation = a large deviation

- Differential diagnosis-

DVD must be differential from inferior oblique overaction

Treatment

A-Non-surgical treatment

conservative therapy in the form of changing the fixation pattern by patching or optical means may be useful

B- surgical treatment