Role of a Standardized Prism Under Cover Test in Assessing Dissociated Vertical Deviation

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INTRODUCTION

Dissociated vertical deviation (DVD) is characterized by slow upward drifting and exocycloversion of the non-fixing eye14. DVD is considered a marker of infantile onset strabismus1-4 and may occur:

- Spontaneously,
- During visual inattention,
- With cover testing1-4.

Typically, clinical measurement of DVD is performed using the prism and alternate cover test (PACT).

The alternative method is prism under cover test (PUCT).5

The relationship between PACT and PUCT has not been previously studied.

METHODS

Prism and Alternate Cover Test (PACT)

- Measured at distance (3m) and near (1/3m) fixation in habitual refractive correction, using loose prisms, and fixing an accommodative target.
- Measured fixing with the habitually fixing eye, as determined by cover test
- Angle data recorded for non-fixing eye
- PACT measured prior to PUCT

Prism Under Cover Test (PUCT)

- Measured at distance fixation only in habitual refractive correction, using loose prisms, and fixing an accommodative target.
- Measured for both right eye and left eye (data from non-fixing eye used for analysis)
- Duration of occlusion standardized by specifying 10-second occlusion for each prism strength

Measurement procedure for right eye

- Vertical prism placed over right eye.
- Occluder kept over right eye for 10 seconds and then switched to the left eye

RESULTS

Clinical Characteristics (n=36)

- Median age 29 years (range 11 to 64 years)
- 18 (50%) exodeviation
- 20 (56%) esodeviation
- 10 (28%) hypodeviation recorded as negative value

Co-existing horizontal strabismus (based on PACT at distance)

- 20/36 (56%) esodeviation
- 16/36 (44%) exodeviation

Previous strabismus surgery

- Any strabismus surgery / Botox N=32 (89%)
- Surgery for DVD (on non-fixing eye) N=11 (31%)

METHODS (CONT.)

Analysis

- Magnitude of vertical deviation by PACT and PUCT, in the non-fixing eye, compared using signed rank tests
- Hypodeviation recorded as negative value
- Agreement between PACT and PUCT measurements assessed by intraclass correlation coefficients
- Frequency of discrepancies more than 4 PD calculated

METHODS (CONT.)

Agreement between PACT and PUCT

- Bland-Altman plot showing differences between PACT and PUCT values
- Moderate agreement with an ICC of 0.71 (95% CI, 0.57 - 0.80).

Differences between PACT and PUCT

- Mean difference (PUCT-PACT): 6.3 ± 5.8PD

CONCLUSIONS

- Prism under cover test measurements yield greater values than prism and alternate cover test in the majority of cases.
- A standardized 10-second prism under cover test may provide more representative measurement of DVD than a prism and alternate cover test.
- Surgical planning based on prism under cover test values may be important for avoiding surgical undercorrection of DVD.

DISCLOSURE

None (All Authors)

REFERENCES