Double vision: what do I do?

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PLAN

INTRODUCTION
INVESTIGATION OF INCOMITANCY
INVESTIGATION OF HETEROPHORIA
INVESTIGATION OF HETEROTROPIA
TREATMENT
CONCLUSIONS

Full handout of slides from www.bruce-evans.co.uk

DISCLOSURE

- Paid lectures & KOL/product feedback programmes:
  - Hoya, CibaVision, CooperVision, Johnson & Johnson, Cerium Visual Technologies, Black & Lizars, Scrivens, Specavers
  - Lecture content always my own
- Author of Pickwell’s Binocular Vision Anomalies, editions 3-5
- i.O.O. Sales Ltd markets IFS orthoptic exercises, which the speaker designed, and for which he receives a small royalty
- Community optometric practice in Brentwood, Essex

OVERVIEW: CAVEAT

- Always look for pathology:
  - Neuro-optometric checks
  - Pupils, discs, fields, strabismus, incomitancy, accommodation
- Check these things regularly
- Don’t forget refraction
- Change management if not improving significantly
- Refer if still not improving
- Appropriate re-exam intervals (frequent)
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For regular tweets on optometric research:

Motility test

- Use reliable pen torch
- Check nose not occluding
- Really, three tests, so do three times:
  1) Observe corneal reflexes
  2) Cover test in peripheral gaze
  3) Ask about diplopia
- Beware of reports of diplopia
  - May break down (in view of target, distance, fus. res.)
  - May be variable
  - May be confused
- Know the muscle actions (RADSIN)

SO palsy: the nightmare muscle

- Nightmare to detect on motility testing
  - Nose gets in the way
  - Lids obscure view
  - Torsional deviation
  - Nightmare to detect because secondary sequelae

Michelangelo’s David

SO palsy

- Usually:
  - Hyper-deviation of affected eye, worse in down-gaze
  - Under-action of affected eye when looking down and in
  - More likely to have symptoms with reading than with distance
- But, may have secondary sequelae
- Avoid fitting multifocal spectacles or monovision

Incomitancies: conclusions

- Some incomitancies are difficult to detect
- 2/3 of diplopic hypertropic pts OK on motility
  
  Tamhankar et al (2011)

- If symptoms are suspicious, do cover testing in peripheral gaze
- Testing for cyclo-deviations detects SO palsies
- Refer new or changing incomitancies
- In some long-standing cases, prescribing the prism required in the primary position may help
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KEY SIGNS OF DECOMP. PHORIA

- Symptoms
- Poor cover test recovery
- Aligning prism
- Low fusional reserve opposing phoria
  - Sheard’s criterion
  - Particularly useful for exophorias
- For esophorias, size and imbalanced fusional reserves are relevant
- For hyperphorias, size matters

KEY SIGNS OF DECOMP. PHORIA

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STEREOTESTS

STRAISMS: the bottom line for the busy optometrist

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For regular tweets on optometric research:
TREATMENT OF AMBLYOPIA (a)

- Flow chart based on review of recent RCTs in Evans et al. (2011; OPO)
- Many cases of amblyopia can be cured by refractive correction alone;
  - 20% don’t need occlusion (Gibson, 1955; Pickwell, 1984; Stewart et al., 2004; West & Williams, 2011)
  - Contact lenses are likely to be best (Evans, 2006)

- Many cases never require full-time occlusion
  - If 6/9 to 6/25, 2h occ. ≡ 6h
  - If ≤ 6/30, 6h > 2h

- Avoid full time occlusion for orthotropic anisometropia
- Timings approximate

See patients frequently during the treatment of amblyopia, to begin with every 4-6 weeks

Flow chart based on review of recent RCTs in Evans et al. (2011; OPO)

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MOTOR DEVIATION: REFRACTIVE CORRECTION: OVERVIEW

- Mandatory in accommodative esotropia
- Also possible to treat exo-deviations with negative lenses & convergence excess with multifocals

- limited by 4 factors
  - angle of deviation
  - refractive error
  - accommodation
  - AC/A ratio

MOTOR DEVIATION: REFRACTIVE CORRECTION: SPECIFICS

- determine sphere that
  - eliminates strabismus (no diplopia)
  - eliminates FD on Mallett Unit

- Can check (2 mins) don’t adapt (North & Henson, 1985)
- prescribe, try to reduce approx. every 3-6/12
- negative adds and bifocals/varifocals can work well

MOTOR DEVIATION: REFRACTIVE CORRECTION: MYTHS

- negative adds might cause myopia
  - overminus lenses do not induce clinically significant myopic changes (Rutstein et al., 1989; Paula et al., 2009)

- patient likely to adapt to the over-correction
  - if abnormal BV, tend not to adapt (North & Henson, 1985)

- bifocals might reduce children’s ability to accommodate
  - smooth muscle; 14D-3D=11D
  - BF don’t reduce amplitude of accommodation (Fresina et al, 2010)

- accommodative (hyperopic) esotropia will not need glasses in later life
  - after 10 yrs, 97% still need Rx (Rutstein & Marsh-Tootle, 1998)

MOTOR DEVIATION: REFRACTIVE CORRECTION: CASE STUDY: D1542

- 11/5/96, female, age 8y, 1 headache a fortnight
  - wearing full cyclo plus (c. +2.00, R=L)
  - cover test: D: 8Δ SOP N: 10Δ RSOT
  - with +2.00 add: N ortho RSOT with +2.50 add: N ortho

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MOTOR DEVIATION: PRISMATIC CORRECTION: OVERVIEW

- preferred treatment in small/moderate vertical deviations
- may also help in small/moderate horizontal deviations if not amenable to refractive modification or exercises

- limited by angle of deviation / cosmesis of prism

"There I was, asleep in this little cave here, when suddenly I was attacked by this hideous thing with five heads!"
MOTOR DEVIATION: PRISMATIC CORRECTION: SPECIFICS

- determine prism that
  - eliminates strabismus (no diplopia)
  - eliminates FD on Mallett Unit
- unlikely to adapt to prism if abnormal BV (North & Henson, 1985)
- but can check (2 mins) don’t adapt (North & Henson, 1985)

MOTOR DEVIATION: PRISMATIC CORRECTION: MYTH

- patient might “eat up prisms”
- prism adaptation usually abnormal in orthoptic anomalies (North & Henson, 1981)
- exceptions can occur
- e.g., myopes with decompensated esophoria

MOTOR DEVIATION: FUSIONAL RESERVE EXERCISES: OVERVIEW

- preferred treatment in small/moderate horizontal deviations, if px co-operative
  - work well in those aged 11-19y, even if strabismic (Pickwell & Jenkins, 1982)
- in exo-deviations improve ability to converge
- in eso-deviations improve ability to diverge
- try to assess progress using a method different to the treatment technique
- there is some supporting evidence from RCTs
  - Ciuffreda & Tannen (1995)

MOTOR DEVIATION: FUSIONAL RESERVE EXERCISES: SPECIFICS

- haploscopic instruments / anaglyphs / vectograms / free-space methods
  - feedback helps, as in computer-orthoptics
  - varying targets & conditions helps
  - a key factor is practitioner enthusiasm
  - (Horwood & Toor, 2014)
  - with a PC & printer anyone can design their own exercises

CONVERGENCE INSUFFICIENCY: SPECIFICS

- treatments in order of increasing complexity:
  - simple push up (bead on string if very remote)
  - jump convergence
  - push up with physiological diplopia
  - jump convergence with physiological diplopia
  - free-space stereograms
- RCT shows intensive programme of exercises better than home push-up (Scheiman et al., 2005)
  - (15min a day + 60min weekly) > 15min a day

DEVELOPMENT OF IFS: Primary goal

- to maintain the patient in an over-converged posture for 10-20 mins a day without them becoming bored
- to provide a variety of stimuli to help any benefit translate into everyday life
- declaration of interest
**IFS EXERCISES: USES**

- IFS exercises can be used to treat:
  - decompensated exophoria at near
  - binocular instability
  - convergence insufficiency
  - intermittent exotropia at near
- Experienced practitioners can also use the exercises to treat constant comitant exotropia at near, usually as part of a more detailed treatment regimen.

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**DEVELOPMENT OF IFS: Card 1**

- Teaches physiological diplopia & introduces 3-D perception

**IF**

**DEVELOPMENT OF IFS: Card 2**

- Builds fusional reserves (step & ramp)
- Controls for & treats suppression

**DEVELOPMENT OF IFS: Card 3**

- Builds fusional reserves
- Controls for suppression
- Card 4 similar, but different autostereogram

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**OPEN TRIAL: Fusional reserves & NPC (N=20)**

- Divergent reserves (control) did not change significantly (p=0.6)
- Convergent reserves improved significantly (p=0.004)
- Mean NPC improved from 6 to 4 cm (p=0.015)

Evans (2000)
OPEN TRIAL: Effect of treatment on compensation

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Evans (2000)

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SYMPTOMS

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Always be on the lookout for pathology
- refer if no significant improvement
- BUT pathology is very rare
- It is possible to treat amblyopia in optometric practice
- patients will need good instructions & regular checks
- Many comitant ocular motor anomalies are treatable
  - plus for eso and minus for exo are under-used treatments
- Vision therapy for convergence insufficiency is evidence-based, but there is a need for more research for other forms of vision therapy

Reference


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