DIPLOPIA AND NORMAL COVER TEST ?

Vincent Paris
Liège
Diplopia and normal CT

- Think about significant deviation with important compensation process

- Think about very small deviation with few individual amplitude of fusion
CT evaluation still difficult even in large deviation (here 70D), even in the operating room ......
Deviation progressively revealed with time under translucent monocular occluder
Mary 8 y
X’ 4 / O (CT)
X’ 5 / X2 (red glass)
Normal convergence
Normal stereoscopy
So what to do?

- Base in prisms!
- $2 + 1$
- Binocular VA increases immediately
- Symptoms free

- 3 years after ....call in emergency: she broke her glasses
At the age of 95, thank you for believing me and give 1 D vertical prism to treat my chronic diplopia!!
Subjective 12° Overcorrection and postop normal CT !!
Diplopia and normal CT

- Normal CT = no deviation, small deviation?
- Normal CT = tonic compensation

- Red glass = *subjective localization*
  (where the patient “think” that the image is supposed to be)

- Torsion !!! Direct and indirects signs
## Specificity of Clinical Tests

<table>
<thead>
<tr>
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<th>Cover Test</th>
<th>Red Glass</th>
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<tbody>
<tr>
<td>Exophoria</td>
<td>88.5%</td>
<td>100%</td>
</tr>
<tr>
<td>Esophoria</td>
<td>79.5%</td>
<td>100%</td>
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<tr>
<td>Hyperphoria</td>
<td>77%</td>
<td>100%</td>
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</table>
Precise measurement of phoria at distance

Need for **scotopic conditions**

Striated red glass
Prisms bar displaced until the red line cross the fixation light

Position red line / fixation light
EXO: red light on the opposite side
ESO: red line on the same side

Red glass in front of the dominant eye
(patch the other eye to make the patient aware of the red line)
Turn the striated glass 90° to assess vertical deviation

10/10 with horizontal prismation

15/10 with oblique prismation
Latent Excyclotropia

- N = 27
- Mean age: 43 (6 – 72)
- NRC 26 / ARC 1
- "Normal" objective torsion: 1
- Unilateral control extorsion: 28.5%
- BHHT: N in 22% / < 10D in 89%
- Hypertropia in PP: N in 33% < 6D in 100%
- Elevation in adduction: 100%
Latent Torsion with normal vertical CT

- From the last 4 years period

- 9 cases
  - (7 unilat excyclo, 1 unilat incyclo, 1 bilat incyclo)
- Normal vertical CT in 11 positions of gaze !!

- **Torsional clues:**
  - Fundus: 78%
  - Hess Weiss: 67%
  - Small V: 33% (excyclo)
METHOD FOR TORSION

SUBJECTIVELY:
- Gracis Double Maddox
- Weiss coordimeter with linear pointer (fusional and non fusional form)

OBJECTIVELY:
- Retinophotography
- Ophtalmoscopy
Specificity Weiss: 93%!

Specificity Maddox: 23%

SUBJECTIVE TORSION
OBJECTIVE TORSION
Red Light flicker projected at distance by a mirror

A new instrument from
ANNA SOPRONI
(Budapest – Hungary)
called “Bunnyeye”
Turn the button for lightening
Fixing eye looks the light
Allowing the observation of objective torsion in the non fixing eye
Under DYNAMIC CONDITIONS

The author has no financial interest
MOST IMPORTANT:

OBJECTIVE TORSION (96% specificity)
Consequences

- **Motor evaluation**: yes
  - in 11 positions of gaze
  - do not trust only CT

- **Sensorial evaluation**: yes!
  - individual amplitude of fusion
  - torsion !!
Consequences

- “Physiological” deviation can be symptomatic
- Surgery disregarding motor deviation
  - failure of prisms
  - acquired loss of fusion
  - esotropia at distance in elderly patient
  - latent torsion
Classical history of “lexalgia”

- H Webb, J Lee, Lexalgia, 2007, Transactions of the 31th ESA meeting
- High IQ
- Computer expert
- Small measurable heterophoria
- Good motor fusion
- Unendurable pain on reading
- SOLUTION: “change your job ...”
Such a case report

- 27 y
- X’ 14 / X 4

- No help from prisms, orthoptic, eye closure
So, what to do? ..........SURGERY!

With $X'_{14} / X_4$ ????!!!!! ..........YES!
AND EVEN TWICE !!!

O’ O after the first step ...........X’14 / o after one year
O’ O after the second step ...........stable after one year
X’ 12 X 6  Good result with prisms during 6 years
No more prismatic help
Symptoms free after unilateral 5mm LR recession
Diplopia at distance after cataract surgery

CT Normal!

E′3 E 10
IOL 2 years ago
Reading problems
Close one eye “to see better”
Normal CT
Objective excyclo OD / subjective excyclo (Weiss)
Specificity of pre op Hess Weiss
Small vertical overcorrection treated by 2 D vertical prism
Symptoms free
Some very unusual case ...

- PG 74 y
- Oblique diplopia when driving since 1 y
- O’E 2 / H 2
- Failure of numerous prisms
- Normal CT in 11 positions
- Objective Torsion? Many drusen ....
- Subjective Torsion?
- Dynamic Gracis Grid Test: transitory cyclodiplopia in right and downgaze...
Harada Ito procedure (topical)
- Perfect immediate outcome
- Single road when going back home
- Small loss of effect after 3 months
  = undercorrection
- Rare and transitory diplopia
- 2D vertical prism still usefull
- Patient happy!
Conclusions

Motor deviation means nothing

- Small deviation + small fusion = symptoms
- Any deviation + effort of compensation = symptoms
- Persistent lack of fusion: think about torsion!
Thank you for your attention ...