

## **Dissociated vertical deviations: now that we know how it develops, how should we treat it?**

### **Desviación vertical disociada: ahora que sabemos cómo se desarrolla, ¿cómo debe ser tratada?**

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El comité editorial se complace en ofrecer las consideraciones personales del Dr. *Cameron F. Parsa*, quien es Profesor Asociado del Departamento de Oftalmología y Ciencias Visuales de la Universidad de Wisconsin y colaborador del equipo de Oftalmología Pediátrica del Instituto Cubano de Oftalmología "Ramón Pando Ferrer", sobre la desviación vertical disociada.

Acerca del artículo:

Hernández Santos LR, Castro Pérez PD, Pons Castro L, Rubán Rodríguez E, Lora Domínguez K, Sibello de Ustua S. Presentación de dos casos con desviación vertical disociada asociada a patrón en A. *Rev Cubana Oftamol.* 2013;26(Sup. 1).

The presence of a dissociated vertical deviation (DVD) attests to an interruption of binocularity reducing fusional potential having occurred prior to the age of 18 months, which allows atavistic pathways of ocular control to become manifest. Despite recent elucidation of the motor mechanisms allowing such apparent violations of Hering's Law<sup>1</sup> and its relation to the vestibular system,<sup>2</sup> surgical approaches for the treatment of DVD remain frustrating. Since this movement appears predominantly mediated by the oblique muscles, theoretically, obliteration or immobilization of the oblique muscles could offer improved long-term control in at least some patients. Surgical approaches used to date,<sup>3,4</sup> however, have merely weakened, and not eliminated, the action of the oblique muscles, and results have been inconsistent. Total removal of the inferior oblique muscle, including from its origin on the maxillary bone, or immobilization procedures similar to that developed by Scott for the rectus muscles<sup>5</sup>, but for the superior oblique muscle as well (i.e., via fixation of the tendon to the trochlea) may be necessary to prevent any effect of contracting muscle, either

directly or through attachments of Tenon's tissue, on the globes in order to be able to fully assess this approach.

Along with the development of DVD, additional secondary changes in extraocular muscles themselves can develop due to the lack of fusion<sup>6</sup> with loss of sarcomeres and shortening of the oblique muscles due to muscle-length adaptations also giving rise to superimposed A- or V-patterns.<sup>7</sup> When verified by fundus torsional assessments in primary gaze,<sup>8,9</sup> such patterns are often best addressed via weakening procedures of the involved muscles which may also effectively reduce the DVD itself. Indeed, for an A-pattern with fundus excyclorotation noted in primary position, weakening of the superior oblique muscles will improve not only the deviation in downgaze, but would also reduce the initial superior oblique muscle action initiating the DVD movement. Weakening of the inferior oblique muscles or, anterior transposition, could also be concomitantly entertained to reduce the forces of muscles involved in creating DVD.

Until further investigations along the lines above are done, and perhaps via other means, time honored approaches such as superior rectus recessions remain in force for the relief of DVD. Small A-patterns can also be reduced by large recessions of the superior rectus muscles which reduce the secondary adductive effect this muscle has when contracting in upgaze. In combination with inferior oblique anterior transpositions up to the level of the insertion of the inferior rectus muscle, this may help reduce the vertical deviation in many instances.<sup>4</sup>

In the future, more specifically identifying which patients predominantly use their oblique muscles to maintain fusion, and which use the vertical rectus muscles more, as has been recently discussed in the setting of superior oblique palsy<sup>10</sup> may also prove helpful in the treatment of DVD. Identifying those in whom the vertical rectus muscles are primarily involved when fusion is maintained, from those in whom the oblique muscles are primarily used, may conceivably allow for improved selection of available procedures to create a tailored approach best-suited to each patient.

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