Short communication

Duane vertical surgical treatment†,☆,☆☆

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ABSTRACT

Case report: We report three cases with a vertical incomitance in upgaze, narrowing of palpebral fissure, and pseudo-overaction of both inferior oblique muscles. Surgery consisted of an elevation of both lateral rectus muscles with an asymmetrical weakening. A satisfactory result was achieved in two cases, whereas a Lambda syndrome appeared in the other case.

Discussion: The surgical technique of upper-insertion with a recession of both lateral rectus muscles improved vertical incomitance in two of the three patients; however, a residual deviation remains in the majority of cases.

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TRATAMIENTO DEL SÍNDROME DE DUANE VERTICAL

RESUMEN

Caso clínico: Se describen tres casos con una incomitancia vertical en Y, disminución de la hendidura palpebral y pseudohiperfunción de oblicuos inferiores. La cirugía consistió en una suprainserción de ambos rectos laterales con debilitamiento asimétrico. El resultado fue satisfactorio en 2 casos, obteniendo en el tercero una inversión de la desviación vertical.

Discusión: En el síndrome de Duane vertical, el debilitamiento de los rectos laterales y la transposición superior de los mismos permitió mejorar la desviación en dos de los tres pacientes tratados. Sin embargo, la corrección total de la desviación suele ser infrecuente, pudiendo quedar alteraciones residuales.

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**Introduction**

The Duane syndrome (DS) is a restricted condition characterized by limited horizontalduction with ocular globe retraction and diminished palpebral fissure. Additional signs which may arise include a generally small horizontal deviation, ocular torticollis and vertical overaction when attempting abduction, also known as upshoots when the direction is upward or downshoots when the direction is downward.

The most standardized classification is that proposed by Huber, which describes three types of DS. There is a fourth variant known as the Y-Duane syndrome, Duane syndrome type IV, Kushner syndrome or Papst syndrome.

The condition consists in orthotropia or moderate exotropia in primary gaze position (PGP) showing in supraversion a large vertical incomitance between 45 and 90 prismatic diopters (Pd).

**Clinical cases**

Description of three healthy patients aged 5, 6 and 9, referred due to divergent strabismus in all cases and with intermittent diplopia in the third. Initial visual acuity (VA) in the three cases was of one in both eyes (BE), with binocularity, TNO being of 120°, 60° and 60°, respectively.

The first patient exhibited exotropia of 6 Pd in PGP with Y-shaped incomitance of 50 Pd, upshoot and diminished palpebral fissure in adduction (Fig. 1). Suprainsertion of both lateral rectus muscles was performed, one insertion and median into original, with asymmetric recession thereof measuring 3 and 4 mm in RE and LE, respectively. The post-surgery result was satisfactory with orthotropia in PGP, correction of vertical phenomenon and slight residual divergence upon supraversion (Fig. 2).

The second patient exhibited 14 Pd exotropia in PGP, with 50 Pd incomitance in Y. In addition, he associated pseudohyperfunction of inferior obliques, diminished palpebral fissure in abduction, torticollis with chin upward and limitation of RE abduction. Suprainsertion of both lateral rectus was performed, one insertion and median into original added to recession thereof measuring 6.5 mm RE and 1 mm LE. The post-surgery period attained orthotropia in PGP with absence of torticollis and H syndrome (Figs. 3 and 4).

The third case exhibited Y-shaped incomitance of 50 Pd, with orthotropia in PGP and chin upwards torticollis. Upon infraversion, the patient exhibited 12 Pd exotropia reaching up to 20 Pd in extreme positions. In addition, pseudohyperfunction of inferior and superior obliques (Fig. 5). Surgery consisted in suprainsertion of both lateral rectus, one insertion and median to the original. However, a – 30 Pd Lambda syndrome upon infraversion was obtained. In a second time, posterior tenectomy of superior obliques was performed, 8 mm RE and 9 mm LE. The result changed only slightly as the patient maintained orthophoria in PGP and with supraversion, divergence with infraversion, maintaining binocularity and absence of diplopia (Fig. 6).

**Discussion**

In our experience, surgical treatment of Y-shaped DS improves vertical incomitance with the subsistence in most cases of residual alterations. Out of the three cases, satisfactory results were obtained in two as in the third the deviation was inverted due to the appearance of divergence in infraversion. Possibly, in this case the technique of choice would have been splitting instead of superior transposition of lateral rectus, due to the existence of pseudohyperfunction of the four oblique muscles. The possibility of not carrying out surgery was not considered as the girl exhibited torticollis with the chin upwards and in addition exhibited manifested diplopia as soon as she carried out the supraversion movements.

Campomanes published similar results in a series of 11 cases in which he performed recession of both lateral rectus at the equator with superior transposition, midway between the original insertion and that of the superior rectus, observing in all cases significant divergence reduction in supraversion with residual alteration.

In turn, Kushner presented a series of nine patients weakening oblique inferior muscles in four cases without correcting Y-shaped anisotropia. However, in three patients said author...
carried out reversion and subprime session of lateral rectus, obtaining improved vertical incomitance.

To conclude, in a condition of a large divergence in supraversion with pseudohyperaction of the four oblique muscles, orthotropia or slight exotropia, including clinical absence of enophthalmos or limitation of abduction, the presence of Y-shaped DS should be considered. Surgery consists in suprainsertion of lateral rectus, associated or not to recession thereof depending on the exhibited horizontal incomitance. In this way vertical incomitance is improved while in most cases residual alteration remains.

Conlicts of interest

No conflicts of interest have been declared by the authors.

References