P22 – Study of Vertical Strabismus by Digitalization of Ocular Movements

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Introduction: Evaluate the capability of a new ocular movement digitizer named GazeLab® (previously named DigMo) displaying and measuring the horizontal and vertical associated ocular motility disorders. The device consists in a helmed with 2 infrared digital cameras and a laser projector.

Methods: First, we study de measurements in different eye positions of 20 normal university students to test de precision and exactitude of the device. A test (laser light) was projected to a screen in the space, just in front of the patient. A total of 12 positions of the motility field were checked in central, medial, lateral, superior and inferior. Second, 10 adolescents (10-15 years old) with complex ocular deviations (horizontal and vertical) were studied with the device. The comparative study was between the standard prisms measurements with the digitized results displayed in a graphic and a table.

Results: The reliability of the device measuring normal patients was: test 0,0 (centre of the axis) showed a SD of 0,3 degrees, test into the central 30 degrees showed a maximum SD of 0,8 and test in extreme position of the gaze, the SD was 1,5. In esotropies (5 cases), the device showed inferior or superior oblique hyperactivities or restrictions. It measures de vertical deviations in adduction in any eye positions you choose. One case was invisible in standard examination.

The vertical deviations of 2 cases of exotropy were patents patients with the device against only one with standard exams. Both patients have different quantity of vertical deviation in abduction. In 1 alphabetic syndrome (exotropy with “V” pattern), the device measures the changes in horizontal angle of deviation while the eye is going from downgaze to upgaze.

The 2 cases with superior oblique palsy were demonstrated during vertical movements in 35 degrees of adduction. Graphics and tables show more comprehensive deviations and very detailed measurements, specially when the ophthalmologist choose correctly the study pattern. On the other hand, the digitizer showed very clear the changes in ocular fixation in any test point studied.

Conclusion: Digitalization of the ocular movements while the eye is looking at a known point in the space can shown detectable and undetectable incomitances in strabismus. It takes reliable measurements and show good information about the behaviour of the extraocular muscles.