

Introduction

Except in nistagmus, **biomechanical OCULAR MEASUREMENTS** aren't standardised in ophthalmology, especially in children. Nowadays, there are a few vide-oculographies (VOG) for clinical use although they aren't satisfying enough.

An ideal solution were a device useful in adults and children with capacity of recording THE MOVEMENTS OF:

- OCULAR GLOBE
- PUPIL
- EYELID



Material and 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 sequence of selected positions of the motility field were checked .

Second, 10 children over 5 years old with complex ocular deviations (horizontal and vertical) were studied with the device and the results were displayed in a graphic(1) and a table (2).

1	Seqüència	Patrò X	Patrò Y	Punt EX	Punt EY	Punt DX	Punt DY	Diferència E / D X	Diferència E / D Y	Cov.
	1	0	0	1.4	-1.1	0.7	-1.3	0.7	0.2	
	2	0	40	13.0	32.0	-0.8	33.8	13.8	-1.8	
	3	0	30	8.3	26.8	-1.2	27.9	9.5	-1.1	
	4	0	20	0.7	18.3	-1.1	16.8	1.8	-0.5	
	5	0	10	0.8	8.7	-0.5	9.3	1.3	-0.8	
	6	0	0	1.3	0.8	0.3	1.2	1.0	-0.8	
	7	0	-10	15.1	-8.7	1.5	-10.4	13.6	1.7	
	11	0	0	2.5	-1.8	1.2	-2.5	1.3	0.7	

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.

THIS SORT OF DEVICES COULD BE AN IMPORTANT SOURCE OF KNOWLEDGE FOR STRABOLOGIST AND NEUROPHTHALMOLOGIST IN THE FUTURE.

THE OBJECTIVE MEASUREMENTS COULD BECOME THE STRABOLOGY IN A MORE SCIENTIFIC SPECIALITY.

Purpose

Evaluate the capability of a new ocular movement digitizer named GazeLab® 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. It can register globe + pupil + eyelid movements and analyzed the results with specific developed software. The test was performed with the last prototype of this device.

Results

DEVICE RELIABILITY IN NORMAL PATIENTS

- test 0,0 (centre of the axis) showed a SD of 0,3º,
- test into 10-30º paracentrals showed a SD until 0,8º
- test in extreme positions (30-50º), the SD was 1,5º.

OBSERVATIONS IN OCULAR VERTICAL DEVIATIONS

- 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 (3).

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 (4).

