

New laser fixation device for ultrasound biometry

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ABSTRACT

PURPOSE: Description of a new laser guided device for ultrasonic biometry.

METHODS/RESULTS: The comparative study of 51 eyes of patients with cataract with interferometry and laser-guided ultrasonic biometry showed no difference between the mean readings. The correlation of the results of both procedures was 0.99 ($P < 0.001$).

CONCLUSIONS: This new fixation device facilitates the reliability of ultrasonic biometry, particularly in patients with dense cataract or posterior subcapsular cataract *Oftalmol Clin Exp 2007; 1 : 20-21*

KEY WORDS: biometry, ultrasonic biometry, ecometry, device, cataract, surgery

Nuevo Sistema de Fijación con Laser para Biometría Ultrasonica

RESUMEN

OBJETIVO: Nuevo dispositivo para mejorar la medición la biometría ultrasonica.

METODOS/RESULTADOS: El estudio comparativo de interferometría óptica y ecometría con ultrasonido en 51 ojos de pacientes con catarata no reveló diferencias entre ambas y la correlación fue 0.99 ($p < 0,001$).

CONCLUSION: Este nuevo dispositivo de fijación permite obtener resultados similares a los obtenidos por medio de la interferometría óptica y facilita la medición en casos de medios densos y cataratas subcapsulares posteriores. *Oftalmol Clin Exp 2007; 1 : 20-21*

PALABRAS CLAVES: biometría, biometría ultrasonica, ecometría, dispositivo, catarata, cirugía

Measurement of the axial length is essential when calculating the intraocular lens for implantation. Currently, biometry may be performed by ultrasound, using contact or immersion techniques or by optical interferometry. Optical interferometry has gained popularity due to the fact that it is a highly reliable method which depends little on the measurement technique. Nevertheless, this method is limited when measuring dense posterior subcapsular cataracts and consequently, it remains essential in these cases to rely on ultrasound technique. One of the difficulties of ultrasound biometry is that the axial length from the corneal apex to the macula cannot be measured in an accurate way. The light present in some probes does not guarantee a proper alignment of the probe with the visual axis. Considering this problem a new biometry probe has been developed

In order to ensure that the biometric measurement equals the visual axis, a low power class 2 diode laser transmitter (similar to a laser pointer) is inserted on the back of the probe, in such a way that the ray of visible energy is

oriented along the same axis of the probe. When the patient focuses on the red dot emitted by the laser with the opposite eye to the one being measured, we ensure that the visual axis equals the axis of the ultrasound probe (Fig. 1). In order to use this device, retinal function must be normal and the patient must have a bifoveal fixation.

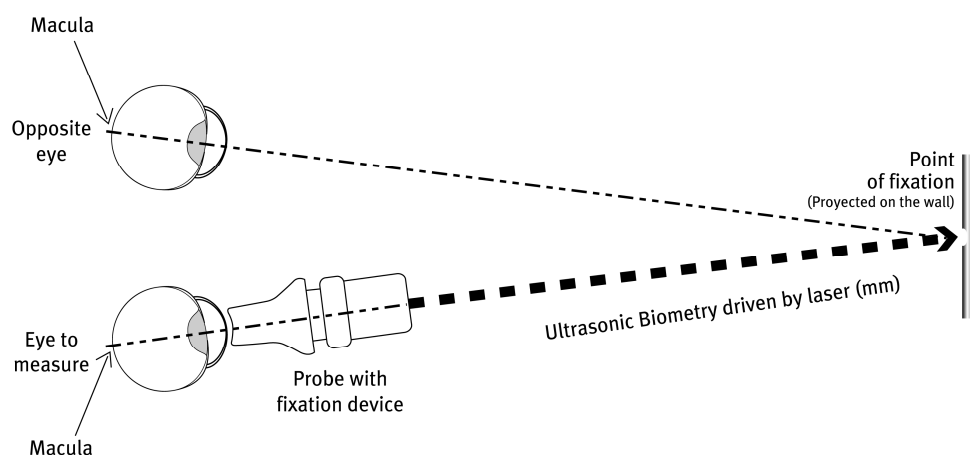


Diagram 1: Alignment of the ultrasound probe with the fixation device. The visual axis of the fixing eye (thin line) coincides with the visual axis of the examining eye (dotted line).



Diagram 2: Ultrasound probe (Aviso, Quantel Medical, Clermont Ferrand, France) with integrated laser fixation device.

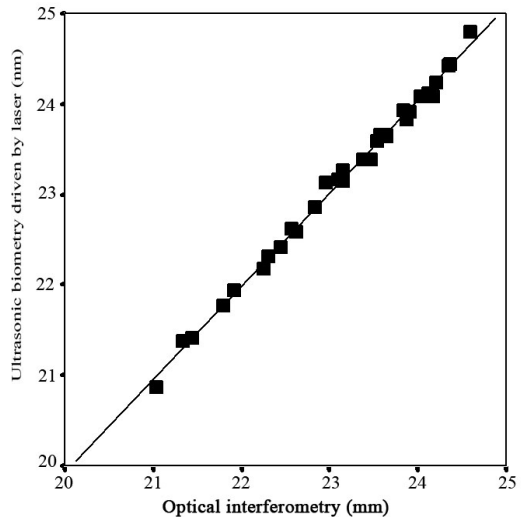


Diagram 3: Dispersion and linear regression comparing optical interferometry and ultrasonic biometry driven by laser: $r = 0.99$, $p < 0.001$

Objective

A study was performed to determine whether ultrasonic measurements obtained with this new device differ from those obtained with optical interferometer.

Methods

After receiving the patients' consent, measurements were performed with both types of equipment in a consecutive series of 51 patients with cataract surgery indication. Measurements with the new device, (Aviso, Quantel Medical, Clermont Ferrand, France) (Fig. 2), were performed during the same consultation prior to measurement with optical interferometry (IOL Master[®], Carl Zeiss Meditec, Inc, USA.). The data obtained were analysed with the statistical program SSPS 11.5 (SSPS Inc., Chicago IL).

Results

Out of 51 patients, 18 (35.3 %) could not be measured by the optical interferometry due to dense cataracts. On the other

hand, it was possible to measure all patients with the ultrasound system. Average measurement with the new laser-guided biometric probe was 23.44 ± 1.78 mm (range 20.87-31.81) and with the optical interferometry method 23.43 ± 1.71 mm (ranges 21.03-31.43).

No statistically significant difference was observed in the average measurement value between optical interferometry and ultrasound with the laser device ($p=0.085$). The correlation coefficient between both measurements was $r=0.99$ ($p < 0.001$) (Fig.3).

Discussion

The device used in order to facilitate biometric measurement improves reliability and precision of the results obtained with ultrasonic biometry. The simplicity and its ease of use makes it possible to readily integrate it in a clinical practice, particularly for patients with dense media and posterior subcapsular cataracts, which have intact retinal function and bifoveal fixation.

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The author is consultant of Quantel medical, Clermont Ferrand, France. This innovative probe, "Martin Charles Fixation Device"; was invented by the author and it was patented and developed by Quantel medical worldwide.