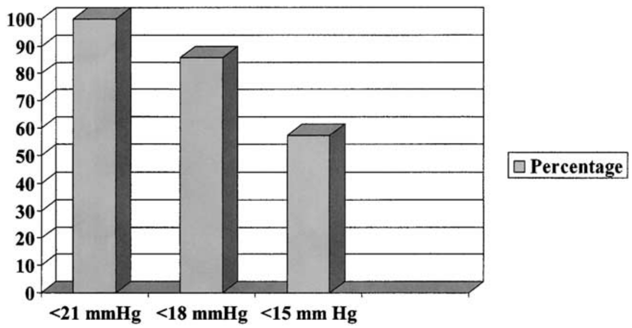

Figure 2. (Rebolleda) Percentage of patients achieving target IOP.

ing dissection of the deep scleral flap, detachment of Descemet's membrane, and the external trabeculectomy. In our experience, the chance for perforation was higher during deep scleral flap dissection.

Based on our review, it appears that when phacoemulsification–DS is complicated with perforation of the TDM, the midterm success rate of the surgery in relation to IOP control is acceptable. Although immediate postoperative complications such as hypotony and hyphema increased in our cases, the results should encourage surgeons to use this nonperforating filtration surgery.

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Optical Quality Analysis System: Instrument for objective clinical evaluation of ocular optical quality

A standard visual acuity evaluation and contrast sensitivity testing are not adequate for an objective visual quality evaluation. This argument, together with aggressive marketing associated with excimer laser technology, has encouraged the use of so-called aberrometers. These devices are based on different sensors or techniques such as Hartmann-Shack or ray tracing, and the information they provide is used for diagnostic purposes and for the calculation of corneal ablation treatments. One limitation of these systems is low interreproducibility.

We present the Optical Quality Analysis System (OQAS, Visiometrics S.L.) based on the double-pass technique. The OQAS was developed to perform an objective evaluation of optical vision quality. The double-pass technique is based on recording images from a point source after reflection in the retina and a double pass through ocular media.[1] The OQAS design is based on the asymmetric scheme of a double-pass technique layout, incorporating improved features adapted for routine measurements in clinical practice (Pujol J, et al. IOVS 2002; 43:ARVO E-Abstract 2038).

Figure 1 shows the OQAS. The light source is a laser diode that acts as a point object. The light is collimated by

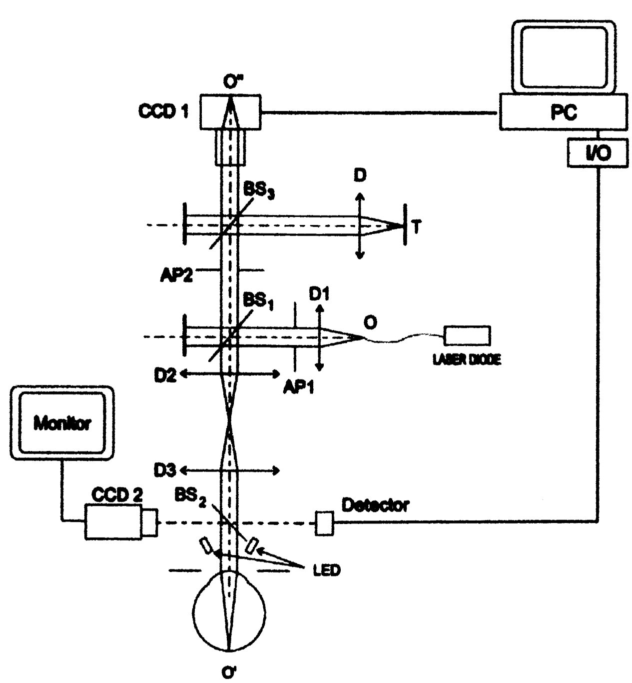

Figure 1. (Güell) The OQAS.

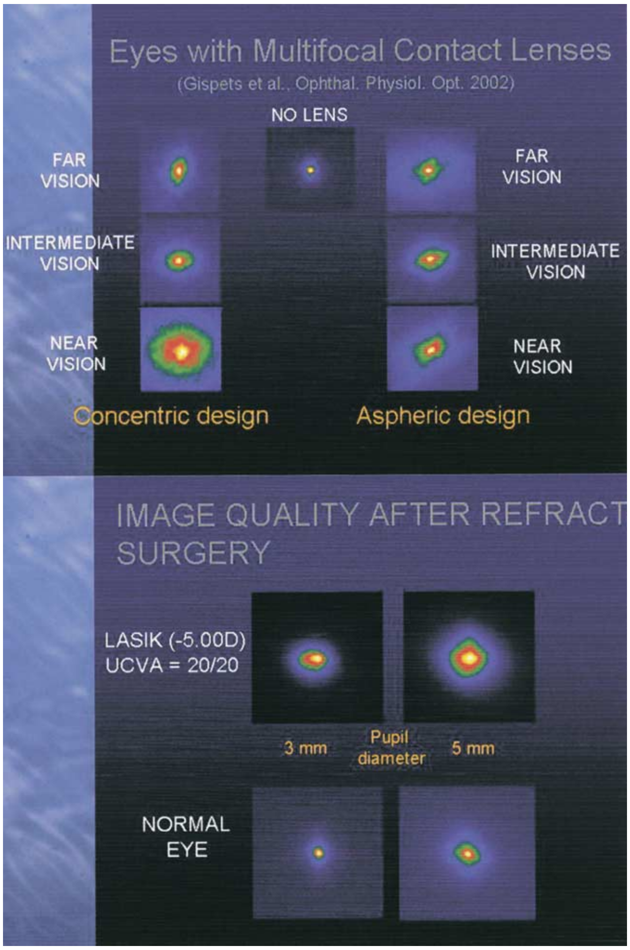

Figure 2. (Güell) Practical examples of the 2-dimensional image from OQAS in different clinical settings.

an achromatic double lens (D1) that passes through an artificial pupil (AP1), acting as an effective entrance pupil. After reflecting through a beam splitter (BS_1), the light passes through 2 achromatic doublet lenses (D2 and D3) and then BS_2; the eye forms the image of the point source on the retina. The pair of doublet lenses, D2 and D3, are a modified Thorner optometer used to compensate for the patient's spherical refraction. The light reflected onto the retina passes through BS_2, the modified Thorner optometer, and BS_1 and passes through another artificial pupil (AP2) acting as an effective exit pupil. Finally, the light passes through BS_3 and an objective lens forms the double-pass image on a charge-coupled device video camera (CCD 1). A personal computer (PC) is used to grab and process the retinal images.

A fixation test is included. A subsystem in the instrument (LED-CCD 2) permits careful control of the pupil diameter and the position and centration of the patient. The sequences for acquisition and treatment of the images have been automated and optimized in the OQAS to obtain the measurements in the least possible time. An algorithm to move the Thorner optometer and automatically find the best focus position is also included.

The light energy reaching the cornea during exposures is measured by a detector placed after the second beam splitter (BS_2). The exposure values obtained are always well below the limits permitted by safety standards.

We are in the process of a large study to normalize the OQAS maps in the general population, although we have measured many eyes before and after surgery and evaluated how lens opacities or pupil size affects the optical quality of the eye (Figure 2). We think the OQAS will play an important role in daily clinical practice, especially if its extra tools are considered (eg, amplitude of accommodation and glare measurement).

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