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Objective Optical Quality After Penetrating Keratoplasty and Deep Anterior Lamelar Keratoplasty

J.L. Guell[1], J. Pujol[2], M. Arjona[2], F. Diaz–Douton[2], S.O. Luque[2] and P. Artal[3]

[1] Cornea–Refractive Surgery Unit, IMO, Barcelona, Spain
[2] Universitat Politecnica de Catalunya, Terrassa, Spain
[3] Laboratorio de Optica, Universidad de Murcia, Murcia, Spain

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Abstract

Purpose: To study the optical, refractive and visual outputs in patients after both penetrating keratoplasty (PKP) and deep anterior lamellar keratoplasty (DALKP). In particular, we will evaluate the possible differences in the ocular optical quality produced by both techniques.

Methods: We selected seven advanced contact lens intolerant keratoconic patients. They had PKP in one eye and DALKP in the other (randomized). After the surgeries, biometric, visual and refractive data were collected for a minimum 18 months follow up (range 18–38 months). In addition, we also measured objectively the optical quality of each eye in the last follow up. This was performed by using a commercially available device (OQAS^{TM}, Visiometrics S.L.) that is based on the double–pass technique. Optical quality was expressed through both the Point Spread Functions (PSFs) and Modulation Transfer Functions (MTFs) directly provided by the OQAS instrument.

Results: We did not find statistically significant differences between both groups in relation with biometric and refractive data. However, best–corrected visual acuity was slightly higher for the PKP group. The estimates of optical quality were better, with a significant difference, both in PSF and MTF for the PKP group in all cases. Objective optical quality estimates were well correlated with visual acuity data.

Conclusions: Despite the obvious advantages of DALKP in eyes with healthy endothelium, the presence of an interface might limit the maximal optical performance as compared to PKP. The use of objective instruments to measure the optical quality, such as OQAS, is a quite powerful to determine the relative quality of different surgery procedures.

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