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Original article - Clinical Science

Intraindividual comparative study of corneal and ocular wavefront aberrations after biaxial microincision versus coaxial small-incision cataract surgery

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Abstract

Aim: To compare the optical outcomes of biaxial microincision cataract surgery (B-MICS) versus coaxial small-incision cataract surgery (C-SICS).

Methods: Thirty patients (sixty eyes) with bilateral age-related cataract underwent B-MICS through a 1.7-mm clear corneal incision (CCI) in one eye and C-SICS through a 2.8-mm CCI in the other eye. Every eye was implanted with a micro incision aspheric aberration-free IOL (Akreos MI60 AO, Bausch and Lomb, USA). Preoperative corneal aberrations, and 3-month postoperative corneal and total ocular aberrations were calculated and compared.

Results: 3-month postoperative corneal root mean square (RMS) of 3rd- to 6th-order aberrations ($p < 0.001$), 3rd-order trefoil ($p = 0.001$), trefoil-like ($p < 0.001$), and 3rd order RMS ($p < 0.001$) were lower in B-MICS group than in C-SICS group. Surgically-induced corneal trefoil was reduced in B-MICS eyes ($p = 0.001$). Total ocular high-order RMS ($p = 0.002$), 3rd-trefoil ($p < 0.001$), trefoil-like ($p < 0.001$) and 5th-order RMS ($p < 0.001$) were lower in B-MICS than in C-SICS eyes. Corneal aberrations were positively correlated with ocular ones for RMS of 3rd- to 6th-order aberrations, 3rd-trefoil and spherical-like aberrations. Visual acuity, refraction and corneal astigmatism were not different between both groups.

Conclusion: Compared to conventional surgery, B-MICS could improve optical performances of the pseudophakic eye reducing surgically-induced corneal higher-order aberrations. (195 words)

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