

Intraocular lens power calculation after automated lamellar keratoplasty for high myopia

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摘要

Abstract

Purpose: To report intraocular lens (IOL) power calculation in 2 eyes that were highly undercorrected by previous myopic automated lamellar keratoplasty (ALK).

Methods: A 35-year-old man underwent bilateral myopic ALK, which caused high residual myopia (-9.0 -4.0×171 and -9.5 -4.5×74). The patient then underwent cataract surgery with IOL implantation for cataract development. The double-K clinical history method was utilized, and satisfactory IOL power prediction results were obtained. Two no-history IOL power calculation methods (Rosa correcting factor method and Ferrara theoretical variable refractive index method), which involved axial length-dependent modification of the keratometer-measured corneal radius, and 1 no-history IOL power calculation method (Shammas' method), which involved axial length-independent modification of the keratometer-measured corneal power, were tested on these 2 eyes.

Results: In both eyes, the double-K SRK-T clinical history method gave small IOL prediction errors (-0.66 and -0.81 D). The Shammas' no-history method gave a slightly higher IOL prediction error in the right eye (-1.67 D) and a small IOL prediction error in the left eye (-0.74 D). Unacceptable IOL power prediction errors would have resulted if Rosa's correcting factor method (-8.07 and -8.35 D) or Ferrara's theoretical variable refractive index method (-17.56 and -18.51 D) had been applied. When we utilized Rosa's method for the IOL power calculation by assuming that the previous ALK had fully corrected the refractive error, the predicted IOL powers were very close to the benchmark IOL powers (IOL power prediction errors: 1.16 and 0.37 D). When we utilized Ferrara's method with the same assumption, the IOL power prediction errors remained high (-6.32 and -7.16 D).

Conclusions: For patients who have had previous myopic ALK (and whose eyes are highly undercorrected) and who require cataract surgery and for whom the pre-ALK history is

available, the double-K method appears to yield excellent predictive results. However, if the pre-ALK history is not available, the Shammas' no-history method appears to yield better results than the Rosa's or the Ferrara's method. High undercorrection by the previous ALK might have been one of the major reasons why Rosa's method resulted in a high IOL prediction error in these 2 eyes. The cause for the marked IOL prediction error by Ferrara's method in this case, however, remains to be determined.