

Scope of applications and experience record with a new generation of Add-On IOLs: The A4W lens

At the end of year 2011, some experts and numerous interested listeners met in Berlin to discuss latest developments in the area of Add-On IOLs introduced at a workshop there. Speakers of this event were Andreas Cordes, M.D., senior physician at Klinik für Augenheilkunde (Ophthalmic Clinic) in Merheim/Germany, as well as Gangolf Sauder, M.D., lecturer and medical director of Charlottenklinik für Augenheilkunde (Ophthalmic Clinic at Charlotte Hospital) in Stuttgart/Germany. Following an overview on the historical development, indications and performance characteristics of the latest generation of Add-On IOLs were presented and the experience record with the new A4W IOL from the 1stQ company were discussed with the workshop participants.

History of Add-On IOLs

Actually, the implantation of two lenses is not really new, as Dr. Andreas Cordes explained in his introductory speech. The basic concept for implanting a second, additional IOL aimed primarily at the correction of refractive errors. First reports on the implantation of two posterior chamber lenses date back to the nineties of the past millennium. The surgical technique was described in the literature



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as implantation of a pick-a-back or piggy-back lens, which, at that time, was primarily used with patients of extreme hyperopia. Also, piggy-back lenses were implanted in particular with children suffering from cataract, as well as for the correction of post-operatively detected refractive errors.

Implantation of two posterior-chamber lenses into the capsular bag is very problematic

In the early phase of piggy-back IOL implantation, two posterior-chamber lenses were implanted into the capsular bag. The lenses used in these implantation procedures were, strictly speaking, not really designed to be jointly implanted into the capsular bag next to each other, as A. Cordes indicated. In particular, the direct physical contact of the two lenses with each other, the lens material used,

plus the tight position leaving a very narrow interlenticular space, often caused post-operative problems, such as a hyperopic shift, following the implantation of this type of piggy-back lenses. Further complications experienced included, notably, pigment dispersion, caused by the sharp edge on the back of the lens, with the potential late effect of a pigment glaucoma, as well as deposit of amorphous material between the two PC lenses,

described as interlenticular opacification, Elschnig pearls or red-rock syndrome. These problems occurred primarily as a consequence of cell migration from the active mitotic zone of the capsular bag into the space between the two lenses (Fig. 1).

Based on this experience from the early phase, a variety of possible solutions were investigated to solve the problems described. One of the proposed remedies suggested occluding the equatorial germination zone. Last – but not least – there was one prime aspect of key importance which triggered the research and development activity towards a new generation of Add-On IOLs: to distinctly separate the implantation site for the two lenses. This is being achieved by implanting one lens into the capsular bag, leading to an occlusion of the germination zone, while the second lens is being implanted into the ciliary sul-

