
History, Background, and Future of Incisional Astigmatic Surgery

SECTION 1: THE FOUNDATION AND FUTURE OF ASTIGMATIC KERATOTOMY

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Modification and control of astigmatism has been a long-term goal of ophthalmology and is a great concern of the cataract surgeon. Despite the use of small incisions, better wound closure, and other technical improvements in cataract and corneal surgery, astigmatism has remained a problem for the cataract and refractive surgeon. Both pre-existing and postoperative astigmatism are of concern because, despite best efforts, significant amounts of astigmatism sometimes remain or develop after surgery. The clinician must then decide on whether to correct it at all and what approach should be used.

Significant amounts of astigmatism can be visually disabling, with reduction in visual acuity and symptoms such as glare, monocular diplopia, asthenopia, and distortion. Even when corrected with spectacles, astigmatism may cause off-axis blur, eye strain, glare, and visual field restriction.

Not all astigmatism needs to be corrected. Astigmatic keratotomy is not indicated if the patient is asymptomatic or if satisfactory correction can be obtained with spectacles.

The use of corneal relaxing incisions for pre-existing astigmatism at the time of cataract surgery was introduced in the 1980s by Drs. Thornton, Osher, Gills, and Nichamin, among others. In the early days of radial keratotomy (RK) and astigmatic keratotomy (AK), there was a great deal of controversy regarding whether refractive error justified surgical intervention, especially whether the pristine cornea should be altered through the use of incisions. As such, addressing astigmatism at the time of cataract surgery remained a debatable and controversial subject for many years.

It was only after early leaders in ophthalmology demonstrated the efficacy of AK, especially the safety of more peripherally located limbal relaxing incisions (LRIs), that this technique came to be accepted and more broadly utilized. New devices and instruments were needed and were subsequently developed to measure and mark for incision placement, and new knives were designed for the precise creation of these refractive incisions.

Those of us who developed these new techniques were lumped into the “buccaneer surgeon” basket. Only when these methods proved successful were we joined by other early adapters. At