Correcting astigmatism during cataract surgery (or after!) with Limbal Relaxing Incisions

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Why?

Patient's visual expectations have increased considerably over the past several years. Cataract surgery alone, ignoring astigmatism and being less than precise with sphere will not provide the outcomes patients expect today. REFRACTIVE CATARCT SURGERY has been the benchmark for success for several years. Intraocular lens (IOL) power selection and corneal astigmatism measurement need to be extremely accurate. To this end, two separate methods of measuring the axial length for IOL power determination and two, occasionally three instruments for measuring the corneal cylinder are recommended.

Corneal and Lenticular Astigmatism

Since the lenticular astigmatism is removed with the cataract opacity it does not need to be addressed. This leaves the corneal astigmatism. Modern Limbal Relaxing Incisions (LRIs) evolved from radial keratotomy (RK) and astigmatic keratotomy (AK) as a safer and more predictable means of treating corneal astigmatism and have been used for 15-20 years. In fact, the first LRI ever documented was by Schiotz in 1885.[1]

LRI Surgeon Statistics

Less than 50% of cataract surgeons perform LRI's and less than 5% tackle astigmatism up to 5.0 Diopters. Starting conservatively, about 12 years ago, after reading a three-page monograph by Jim Gills, M.D. in Florida I gradually developed a technique that can resolve up to 5.0 Diopters of corneal astigmatism.

The Development of Toric IOLs

Toric IOLs are a more recent development and are only available in limited powers with a significant decrease in effective power at the corneal plane relative to the actual IOL power. Their goal is to neutralize the corneal astigmatism by introducing new IOL astigmatism; "Fighting astigmatism with astigmatism" when elimination of corneal astigmatism is a more logical goal. Toric IOLs are preferable for vary specific indications e.g., after RK with a significantly destabilized cornea.

Case Studies

Recently, a patient was treated with two 9 mm LRIs having had surgery elsewhere with a result of:

plano -0.50 X20 OD

Her preoperative manifest was:

+0.75 -2.75 X30 OD

+4.00 -3.75 X175 OS

She complained of not seeing well after her cataract surgery "like all my friends."

Another memorable patient was +6.50 -4.00 X5 preoperatively and -0.50 -0.50 X180 after paired LRIs measuring 7 and 9 mm.

Conclusion

In 12 years of performing LRIs, several times a day and operating two days per week, additional LRI surgery has not been required to enhance the result. The results are permanent as these patients are still being followed within the practice. Three or four patients were brought back to the OR in 12 years because of a "hyper response" and these patients responded uniformly well to a correction.

To be sure some few patients may have benefitted from LASIK enhancement however, in 30 years and after some 15,000 cataract surgeries laser enhancement surgery has not been necessary. This also includes almost 500 advanced-technology IOLs (multifocal/accommodative) that the industry indicates typically require a 10-15% laser enhancement rate.

[1] Kovoor, T. (2011, March 29). Lasik Surgery: History from Blade to Laser, Retrieved June 21, 2011 from the World Wide Web: http://ehealthandfitnessmagazine.com/lasik-surgery-history-from-blade-to-laser/