

Table 11-1

Stepladder Approach to the Treatment of Astigmatism at the Time of Cataract Surgery

<i>Corneal Astigmatism</i>	<i>Treatment Approach</i>
<1.00 D	Phacoemulsification incision on the steep axis of corneal astigmatism
1.00 to 1.50 D	Paired peripheral corneal-relaxing incisions on the steep axis of corneal astigmatism
1.50 to 4.00 D	Toric IOL implantation
>4.00 D	Toric IOL implantation plus peripheral corneal-relaxing incisions

incision on the steep axis is not always feasible considering microscope position, leg room beneath the operating table, prominent brows, and other factors.

In our opinion, PCRI is best for treating 1.00 to 1.50 D of astigmatism, although toric IOLs can also be considered. A nontoric IOL and a cornea with minimal residual cylinder should provide an optically superior result to the alternative of a toric IOL behind a toric cornea. Peripheral corneal-relaxing incisions alone are effective when implanting a nontoric multifocal IOL or on the occasion when a toric monofocal IOL is unavailable. It should be noted that PCRI does not alter the spherical equivalent power of the cornea enough to affect IOL power calculations. Paired incisions from 450 to 600 μm deep are made in the steep meridian of symmetric “bow-tie” corneal astigmatism. Deeper incisions are needed for younger patients. Although nomograms expressed in degrees and millimeters are available, we prefer a nomogram using clock hours, which is easier to visualize. The paired incisions are as long in clock hours as the cornea is steep in diopters (Figure 11-1).

The most consistent depth is achieved when the incisions are made at the beginning of surgery. A cornea found to be ectatic on topography, or otherwise suspicious for excessive thinning, should not be considered for PCRI. Some surgeons use peripheral corneal pachymetry to set the blade for a 90% incision depth. In our experience, a depth of 450 to 500 μm achieves a safe and reliable astigmatic reduction in the cataract-aged population. The incision is made just inside the conjunctiva, following the arc of the limbus, using a special astigmatic keratotomy blade. The cornea should be kept relatively dry to aid identification of small perforations, which can typically be sealed by stromal hydration. The phacoemulsification incision is then made through one of the paired PCRI.

Toric IOLs can effectively treat >1.50 D of corneal astigmatism, either alone or in combination with paired PCRI (Figure 11-2). Two manufacturers currently produce US Food and Drug Administration-approved toric IOLs in the United States. STAAR Surgical Company produces the AA4203TF and AA4203TL models, both of which are silicone-plate, haptic-design lenses with overall haptic lengths of 10.8 mm and 11.2 mm, respectively. The longer haptic was designed to provide better rotational stability. Cylinder powers of 2.00 D and 3.50 D, correcting 1.40-D and 2.30-D cylinder at the corneal plane, respectively, are available for both IOL models. Alcon Laboratories produces a single-piece, open-loop haptic, acrylic, toric IOL. The spherical SN60T