ACHIEVING FIRST FIT SUCCESS WITH TORIC SOFT LENSES

Phyllis L. Rakow, COMT, NCLE-AC, FCLSA(H)

ASTIGMATISM IN PROSPECTIVE CONTACT LENS WEARERS

<table>
<thead>
<tr>
<th>Astigmatism Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25 OR MORE</td>
<td>76.5%</td>
</tr>
<tr>
<td>0.50</td>
<td>61.5%</td>
</tr>
<tr>
<td>0.75</td>
<td>45.4%</td>
</tr>
<tr>
<td>1.00</td>
<td>34.8%</td>
</tr>
<tr>
<td>1.25</td>
<td>24.8%</td>
</tr>
<tr>
<td>1.50</td>
<td>19.2%</td>
</tr>
<tr>
<td>1.75</td>
<td>15.8%</td>
</tr>
<tr>
<td>2.25</td>
<td>10.0%</td>
</tr>
<tr>
<td>3.00</td>
<td>3.4%</td>
</tr>
</tbody>
</table>

PATIENT AWARENESS

- Astigmatism poorly understood by public
- Most think they have it
- Better communications needed
HOW TORIC LENSES CORRECT ASTIGMATISM

• The principal meridians of the patient’s glasses or soft lenses must align precisely with the principal meridians of the patient’s astigmatism
• With glasses the lenses are held in place by the frames
• Toric CLs must be designed so they will not rotate out of position

GOALS OF TORIC LENS FITTING

• Full corneal coverage
• Adequate movement with blink & in upward gaze
• VA comparable to glasses
• Stable lens orientation in relation to cylinder axis
• Quick & consistent return to position if lens is mislocated

GOALS

• To avoid problems
• To minimize chair time

PREDICTORS OF SUCCESS

• Evaluation of K-readings
• Previous lens wearing history
• Occupational & recreational needs
• Patient desire for immediate comfort

EXPLAIN TO THE PATIENT

• Toric fitting is trial & error process
• Cannot choose lens accurately based on refraction & K’s
  – Influence of lids is unknown
  – Influence of peripheral cornea is unknown
• Must use diagnostic lenses
• Occasional problems with QC & reproducibility

EVALUATION OF K-READINGS

• Compare refractive & corneal astigmatism
• Should coincide in degree & axis for GP success
  – -4.50 -2.00 X 180  44.50@180/46.25@90
• Suggest soft torics if residual astigmatism in anticipated
  – -4.50 -2.00 X 180  44.50@180/44.75@90
• Minimize chair time by going directly to soft torics
PREVIOUS LENS WEARING HISTORY

• Poor tolerance or physiological problems with GPs
  – Moderate-to-severe 3 & 9 o’clock staining
    • No improvement with lubrication
    • No improvement with change in design
    • No improvement with ↓ center thickness
    • No improvement with blinking exercises

• Complaints of dryness, burning, limited wear time
  • Poor centration with RGP s
    – ATR or oblique astigmatism
    – Fluctuating VA with lens displacement
    – Lid bumping
    – 3 & 9 staining
    – Discomfort

• Complaints of flare
  – Large pupils in dim illumination
  – Decentered lenses
  – No improvement with ↓OZ or OAD of GP lens
  – No improvement with aspheric GP design

• Larger OZ & minimal movement of soft torics eliminates flare, enhances comfort

PATIENT LIFESTYLE

• Would spontaneous GP loss or displacement endanger patient or others?
  – Contact sports
  – Airline pilots
  – Police
  – Emergency workers

ALTERNATIVES TO TORIC LENSES

• Stiff spherical soft lenses
  – Silicone hydrogels

• Aspheric soft lenses
  – Frequency
  – Avaira
  – Pure Vision
  – Biomedics Premier

• Patient might prefer slightly blurred stable VA to fluctuation with each blink

CHOOSING A LENS

CONSIDERATIONS

• Water content
• Means of stabilization
• Anatomy of eyes & adnexa
• Tear quality & quantity
• Refractive error
MEETING CORNEAL OXYGEN DEMANDS

- Advantages of silicone hydrogel materials
  - Less myopia creep
  - Less corneal edema
  - Reduce chance of neo & corneal ectasia under base of prism

Dk/t VALUES

CURRENT SILICONE HYDROGEL TORICS
- Acuvue Advance Dk/t 86
- Acuvue Oasys Dk/t 129
- Air Optix Dk/t 108
- Avaira Dk/t 100
- Biofinity Dk/t 128
- PureVision/PV2 Dk/t 91

TRADITIONAL HYDROGEL TORICS
- B & L Soflens Dk/t 16.4
- Biomedics 55 Dk/t 17.8
- Frequency Toric Dk/t 15.7
- Proclear Toric Dk/t 24.5
- Vertex Toric Dk/t 17.9

DIAGNOSTIC VS. EMPIRICAL FITTING

- Trials save chair time
  - Can evaluate influence of lids, tears, peripheral topography on fit
  - Can perform more accurate overrefraction
- Trials should equilibrate 15-20 minutes before evaluating

BEST CHANCE OF SUCCESS

- Lower lid margin at lower limbus
- Cylinder axis at or near 90º or 180º
- Loose lids
- Large fissure

FACTORS CONTRIBUTING TO STABILITY

Anatomy Of Upper Lid
- Tightness
- Contour
- Position
- Interaction of upper lid with thickness profile of lens may cause rotation in oblique astigmats

UPPER LID FORCES
POOR TORIC CANDIDATES

- Very tight lids
- Narrow palpebral fissures
- Poor tear quality & quantity
- Oblique astigmatism

POOR TORIC CANDIDATES

- Mostly lenticular astigmatism
- Refractive astigmatism ≥ 2.75 D
- Recovering rigid lens wearer
- Very sensitive to slight Rx changes

CASES TO AVOID

- Rx mostly cylinder with little or no sphere
- High cylinder needs – Axis alignment critical
- Steep corneas
- Tight lids – Make lock lenses in position of insertion – Lenses won’t rotate into position
- Exophthalmic eyes – No lid forces to stabilize lenses

SOFT TORIC DESIGNS

UNUSUAL CORNEAL CURVATURES

CONSIDER CUSTOM TORICS FOR:

- Very flat corneas
- Very steep corneas
- Astigmatism ≥ 3.00 D
- Little or no spherical component – Acute awareness of minor shifts in axis

UNILATERAL ASTIGMATISM

- Greater lens awareness
- More complaints of “eyestrain”
- Diplopia or vertical phoria in downgaze
**PRISM BALLAST TORICS**

![Image of PRISM BALLAST TORICS](image)

**DUAL THIN ZONE DESIGNS**

(Double Slab-off or Dynamic Stabilization)

**Good For:**
- Unilateral astigmats
- Tight lids
- Blur in downgaze

Upper & lower lids stabilize lenses

---

**PRECISION BALANCE 8/4 DESIGN**

- Air Optix for Astigmatism
  - Thickest points of lens at 8 & 4 o’clock
  - Minimizes interaction with lower lid
  - Improves comfort
  - Maximizes $O_2$ transmission at 6’o’clock
  - Wide optic zone
  - Good stability

**AIR OPTIX 8/4 DESIGN**

![Image of AIR OPTIX 8/4 DESIGN](image)

---

**PRISM BALLAST PLANNED REPLACEMENT TORICS**

**DAILY DISPOSABLE TORICS**

![Image of PRISM BALLAST PLANNED REPLACEMENT TORICS](image)

![Image of DAILY DISPOSABLE TORICS](image)
LENS MARKINGS

- Place on thickest part of lens to avoid weak spot
  - Engraved dots
  - Scribe marks
  - Laser traces

DOUBLE SLAB-OFF MARKINGS

CALCULATING SPHERE POWER

- Make sure Rx is in minus cylinder form
- Compensate for vertex distance in both meridians
  - EG: - 5.00 - 3.00 X 180
  - Power @ 180° = - 5.00
  - Power @ 90° = - 8.00
  - CL Rx should be - 4.75 – 2.50 X 180

CALCULATING CYLINDER POWER

- Cut cylinder power as much as possible
  - 30% WTR
  - 20% ATR
- Wrapping effect of lens on cornea enhances cylinder power
- Higher cylinder power causes more blur if lens shifts off-axis
- Overcorrecting cylinder creates new cylinder with axis 90° away from the original

THE LARS PRINCIPLE

- Imagine the eye as a clock
- Every 5 minutes on the clock equals 30° of rotation
- A lens more than 20° off-axis may not be stable on the eye
- Most rotation is nasal in direction

Left – Add
Right - Subtract
CLOCKWISE/COUNTERCLOCKWISE RULE

- Eyepiece reticule on slit-lamp
- Estimate (clockface)
- SWAG
- Observe, measure, then correct
- Overrefract with spheres only unless you are ordering custom lenses that ask for a spherocylinder overrefraction

CALCULATING MISALIGNMENT

COMPENSATING FOR ROTATION

Example 1
- Patient’s cylinder axis is 180º
- Lens marking is 3 minutes (18º) to your left
- Add 18º to refractive axis
- Select another trial close to axis 18º
- Let lens equilibrate again
- Re-evaluate

Example 2
- Patient’s cylinder axis is 80º
- Lens marking is 2 minutes (12º) to your right
- Subtract 12º from 80º
- Select trial close to 68º
- Let lens equilibrate
- Re-evaluate

The new lens must orient in exactly the same position as the previous one in order for its axis to be aligned correctly in the patient’s eye!

If it does not, VA will not be acceptable!

EVALUATING THE FIT

Steep Lens Symptoms

- Fluctuating VA with post-blink clearing
- Minimal or no movement or lag in upgaze
- Internal air bubbles
- Blanching of conjunctival vessels
MORE STEEP LENS SYMPTOMS

- Minimal or no movement
- Minimal or no lag in upgaze
- Conjunctival drag
- Scleral indentation after lens removal

MORE FLAT LENS SYMPTOMS

- Post-blink decentration
- Inferior edge lift
- Discomfort & irritation (FB sensation)

MORE FLAT LENS SYMPTOMS

- Rotation >5° with blink
- Unstable orientation between blinks
- Lag >5° mm post-blink or in upgaze
- Fluctuating VA with post-blink blurring

CREEPING ROTATION WITH BLINK

OTHER SYMPTOMS

- Blur when reading
  - Refit with double slab-off design if possible
  - Hold reading material higher to clear base of prism

EVALUATING SIGNS & SYMPTOMS

- Ask patient to blink several times while viewing eye chart
  - VA should be stable
- Look for edge lift or interior bubbles
- Look for conjunctival drag
CORRECTING MISALIGNMENT

- Calculate degrees of misalignment
- Apply LARS Principle or Clockwise/Counterclockwise Rule
- Order lens with corrected axis

CRITERIA OF A WELL-FITTED TORIC LENS

- Full corneal coverage
- Good centration (concentric around visible iris)
- Satisfactory movement
  - Vertical movement only
  - No rotational movement
  - 0.5 mm – 1.0 mm lag in upgaze
  - 0.5 mm movement with blink

CRITERIA OF A WELL-FITTED TORIC LENS

- Stable orientation
- Quick & consistent return if lens is mislocated
- Good comfort
- VA comparable to best spectacle VA

PHYSIOLOGIC RESPONSES

- Corneal Staining
  - Blood vessels
    - Limbal
    - Corneal neovascularization under prism
    - Bulbar
    - Palpebral
- Striae, Edema, Myopia Creep, Pseudokeratoconus
  - Fit highest Dk lens available
  - Limit wear time
  - Consider hyperpermeable GPs

IF THE LENS DOESN’T PERFORM AS EXPECTED

- Was LARS done correctly?
  - Left Add to your left, not the patient’s
  - Right Subtract to your right
  - Was the trial the same brand as the ordered lens?
  - Was the trial close enough to the patient’s Rx in sphere, cylinder, & axis?
  - Were the trial, the ordered lens, or both defective?

GOOD INITIAL FIT, LENS NOW UNSTABLE

- Check for coating & deposits
- Check for GPC & blepharitis
- Check for cosmetic contaminants & hairspray
- Review care regimen
- Review replacement intervals
REMEMBER

• We’ve come a long way
• But still not all patients can be fitted