IOL POWER CALCULATION AFTER CORNEAL REFRACTIVE SURGERY: AN ADVANCED LENS MEASUREMENT APPROACH (ALMA)

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No financial interest in any material or method mentioned

IOL POWER CALCULATION

• MEASUREMENTS OF AEL (0.1 mm = 0.25 D)
• MEASUREMENTS OF THE CORNEAL POWER (0.1 mm = 0.50 D)
• WHITE TO WHITE
• FORMULAS
CORNEAL POWER CALCULATION

(0.1 mm = 0.5 D)

- Manual Keratometry
- Automated Keratometry
- Corneal Topography

Not reliable after corneal refractive surgery

Myopic PRK

Corneal power overestimation

IOL power underestimation

Post operative Hyperopia
CORNEAL RADIUS CORRECTING FACTORS

R factor

R = 0.0276 * AL + 0.3635

R = correcting factor to be multiplied to the measured corneal radius

- No need of treatment knowledge
- No need of a good VA

Clinical Results of a Corneal Radius Correcting Factor in Calculating Intraocular Lens Power After Corneal Refractive Surgery

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ABSTRACT

PURPOSE: To determine the clinical results of a corneal radius correcting factor (CRCF) when used in the calculation of intraocular lens (IOL) power after photorefractive keratectomy (PRK), photoablation for keratoconus (PKP), and LASIK. METHODS: Logistic regression analysis was performed on 130 eyes with a CRCF. RESULTS: The logistic regression analysis was performed on 130 eyes with a CRCF. CONCLUSIONS: The results of this study confirm previous findings that the CRCF can be used in the calculation of IOL power after PRK, PKP, and LASIK.

SRK T
< 30 mm

SRK T
SRK 2
>30 mm
AL MA
Avanced Lens Measurement Approach

• Based on AL *K

TO IMPROVE THE RESULTS OF
• HISTORY BASED METHODS
• NO HISTORY BASED METHODS
• RK PATIENTS

Hystory-based methods

\[ Y = -0.0157 \times (AL \times K) + 16.437 \]

Ex:
Sph = – 5 D and an AL * K = 1200,

\[ Y = -0.0157 \times 1200 + 16.437 = - 2.4 \text{ D} \]

Calculated post operative refraction: -2.4,
Cataract induced refractive change: -5 \( - (-2.4) \) = - 2.6 D.
AL MA for R Factor

AL * K > 1060

\[ Y = -0.0157 \times (AL \times K) + 16.437 \]

Es:
AL * K = 1200,
\[ Y = -0.0157 \times 1200 + 16.437 = -2.4 \text{ D} \]
After refractive surgery: -2.4,

IOL POWER CALCULATION AIMING AT A POST OPERATIVE REFRACTION OF +2.4D
(for RK patients too)

<table>
<thead>
<tr>
<th>Without correction</th>
<th>R factor</th>
<th>AL * K</th>
</tr>
</thead>
<tbody>
<tr>
<td>± 0.5 D</td>
<td>1 (4%)</td>
<td>13 (48%)</td>
</tr>
<tr>
<td>± 1 D</td>
<td>2 (7%)</td>
<td>17 (63%)</td>
</tr>
<tr>
<td>± 2 D</td>
<td>5 (19%)</td>
<td>23 (85%)</td>
</tr>
</tbody>
</table>

27 RK eyes from the literature
CONCLUSIONS

• This method doesn’t require the knowledge of the patients’ history
• Can be utilized even in patients with high hypo corrections
• Can improve the results of the formulas which require the knowledge of the patients’ history

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Thank You very much