Premium IOL Implantation Calculations in Post-LASIK Cataract Eyes Using ASCRS IOL Calculator

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Financial Disclosures

Sahiba K. Chailertborisuth and Saneha K. Borisuth have no financial interest in the subject matter of this e-poster.

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Introduction

- **In the post-refractive surgery cataract eye, the selection of an intraocular lens with appropriate power for implantation can be inaccurate.**
- **Premium IOL implantation in the post-refractive surgery cataract eye represents a unique subset of patients.**
- **The visual outcome as well as spectacle independence of these patients is highly dependent on the refractive outcome.**
- **The purpose of this study is to evaluate the clinical outcomes of post-LASIK cataract eyes undergoing phacoemulsification with premium IOLs and to assess the accuracy of the ASCRS IOL Calculator for these eyes.**

Methods

- **Retrospective chart review of 25 eyes of 21 post-LASIK (myopic LASIK n=15 , hyperopic LASIK n=10) patients undergoing diffractive mIOL (n=15) or toric lens (n=10) implantation after routine phacoemulsification.**

- **Diffractive multifocal lenses consisted of ZMB00 (n=11) (AMO, Inc.) or SN6AD1/D3 (n=4) (Alcon Labs) models. Toric lenses consisted of SN6AT3/T4 lens (n=10) (Alcon Labs).**

- **Postoperative refractive data was used to compare back-calculated optimum IOL powers (BCI) to those predicted by using the ASCRS IOL calculator.**

Methods

- **We analyzed the MRSE, UDVA, UNVA, and the rate of excimer laser enhancement to obtain the target postoperative refraction.**

- **The absolute prediction error (PE) of each formula was calculated by the following:**

PE = [Predicted Lens Power – Optimal Lens Power to achieve desired refraction]

Baseline Characteristics of Patients:

	No. of Eyes	Mean (SD)
Age	25	62.6 (7.42)
Sex Females Males	 14 7	
Eye OD OS	25 13 12	
Axial Length (mm)	25	24.4 (1.23)
ACD (mm)	25	3.27 (0.36)
Average K's (D)	25	44.5 (3.5)
Lens Implanted ZMB00 SN6AD1/D3 SN6AT3/T4	25 11 4 10	
Lens Power (D) Multifocal IOL Toric IOL	 15 10	18.9 (3.6) 18.8 (3.30) 20.1 (1.20)

Results

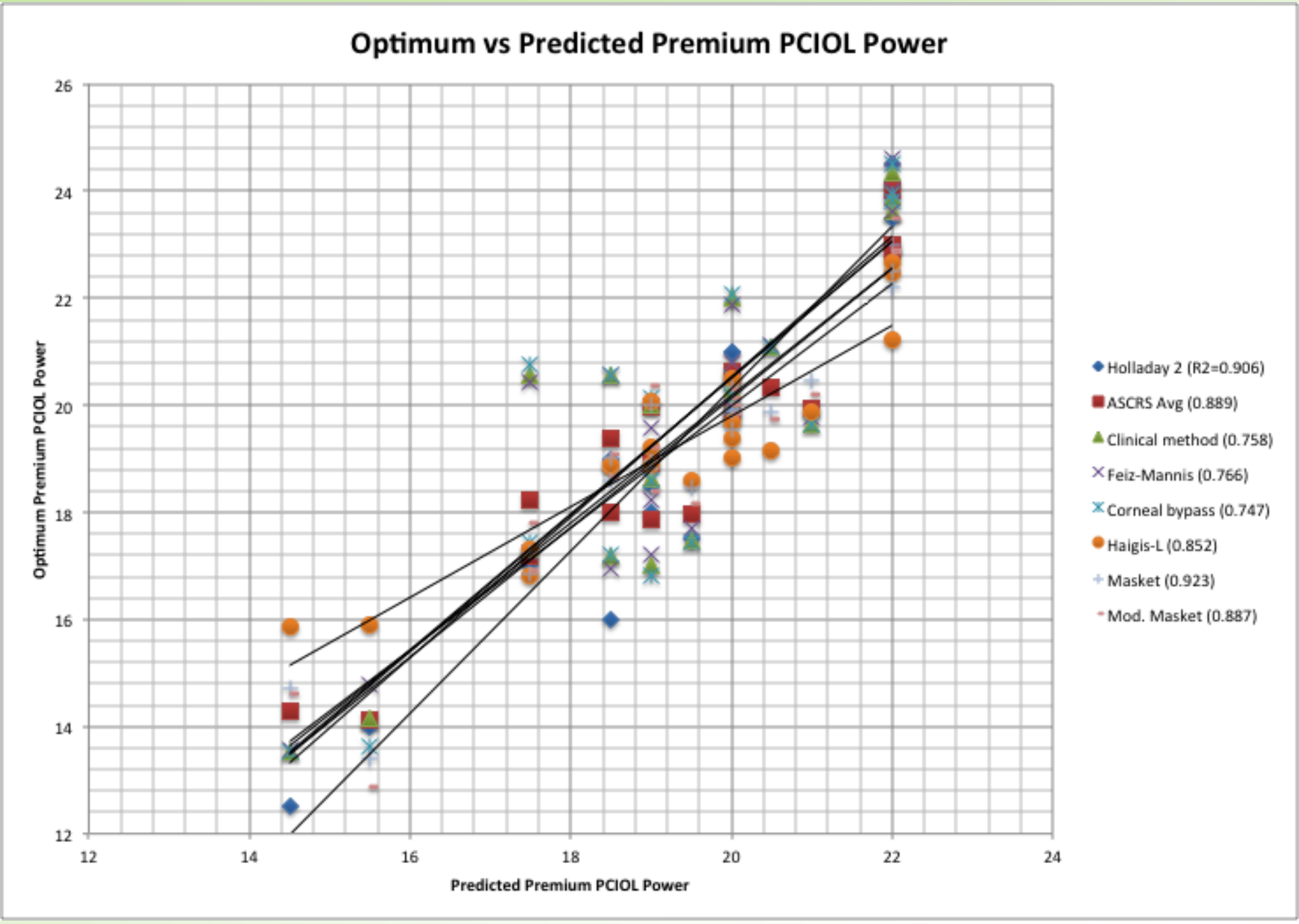
- **UNVA in the multifocal PCIOL group significantly improved from 0.50 ± 0.10 to 0.05 ± 0.08 logMAR units (p <0.001).**

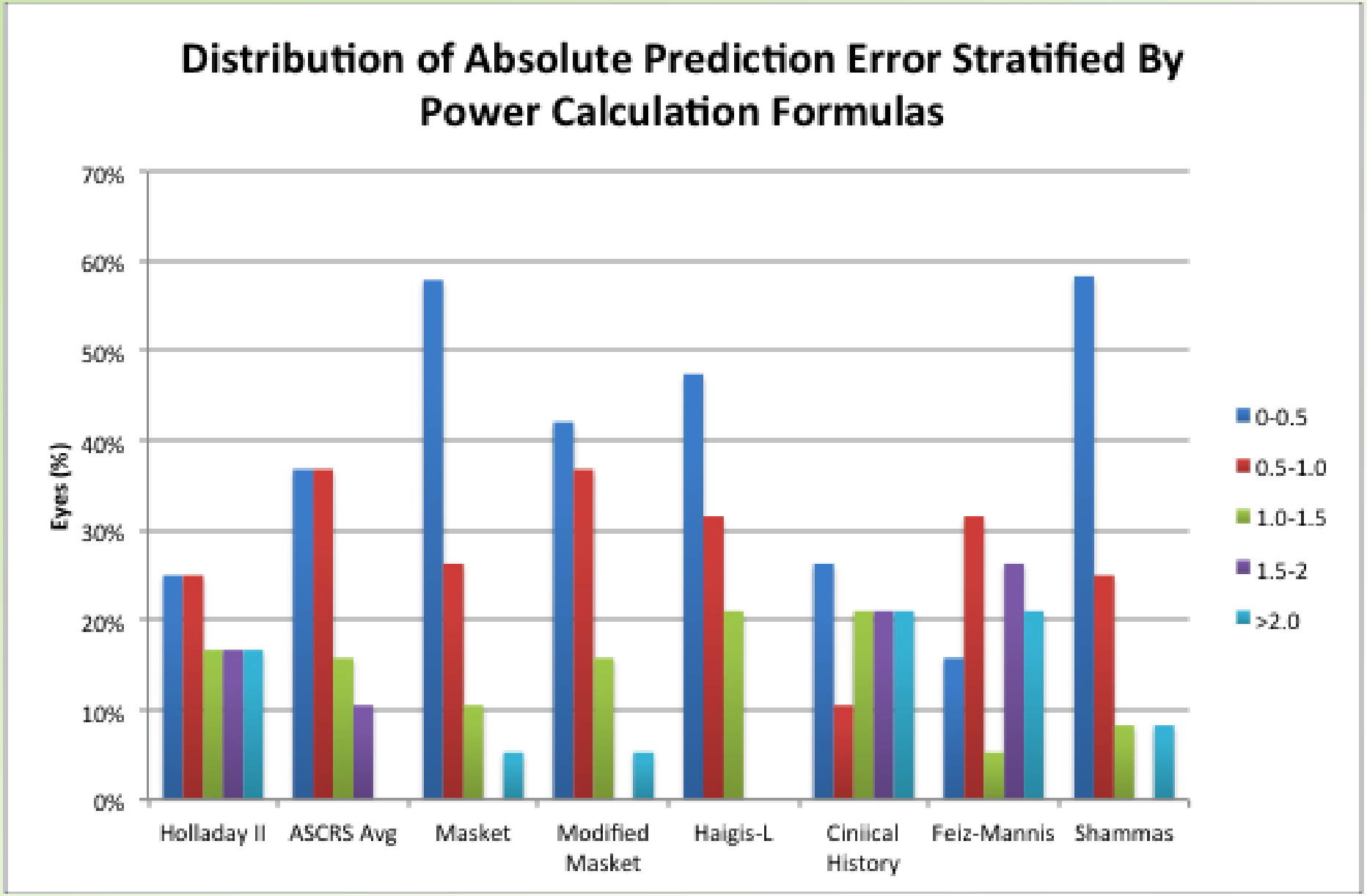
- **Astigmatism in the toric PCIOL group significantly improved from 1.18 ± 0.23 D to 0.64 ± 0.40 D (p = 0.027).**

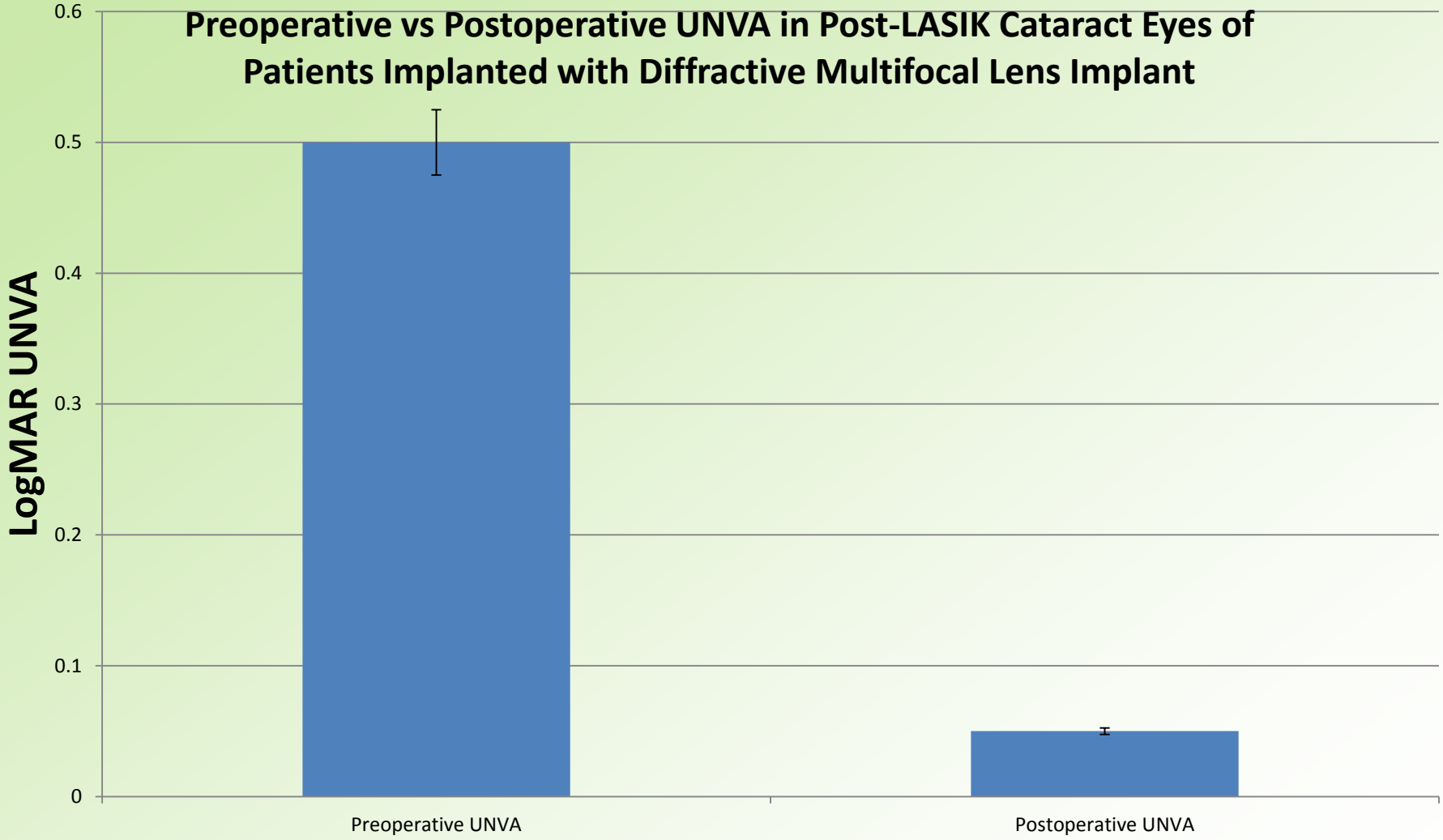
- **59% of eyes were within ± 0.5 D of target outcomes, 72.6% within ± 1.0 D, 86.2% within ± 1.5D, 95.3% within ± 2.0 D and 100% were within ± 2.5 D.**

- **Back-calculated optimum IOL powers correlated highest with ASCRS Average IOL power, modified Masket, Masket, and Haigis-L power calculations**

- **Excimer laser enhancement was performed in 12 eyes (43% of eyes) because of residual refractive error.**


Optimum vs Predicted Premium PCIOL Power
Optimum Premium PCIOL Power
Predicted Premium PCIOL Power
26
24
22
20
18
16
14
12
12
14
16
18
20
22
24
Holladay 2 (R2=0.906)
ASCRS Avg (0.889)
Clinical method (0.758)
Feiz-Mannis (0.766)
Corneal bypass (0.747)
Haigis-L (0.852)
Masket (0.923)
Mod. Masket (0.887)


Distribution of Absolute Prediction Error Stratified By Power Calculation Formulas
70%
60%
50%
40%
30%
20%
10%
0%
Eyes (%)
Holladay II
ASCRS Avg
Masket
Modified Masket
Haigis-L
Cinlical History
Feiz-Mannis
Shammas
0-0.5
0.5-1.0
1.0-1.5
1.5-2
>2.0


Preoperative vs Postoperative UNVA in Post-LASIK Cataract Eyes of Patients Implanted with Diffractive Multifocal Lens Implant
LogMAR UNVA
0.6
0.5
0.4
0.3
0.2
0.1
0
Preoperative UNVA
Postoperative UNVA

Conclusions

- **Inaccuracies in formulas for premium IOL power calculations are further inflated in the post-LASIK eye.**
- **Intraoperative aberrometry IOL power calculations have been shown to achieve excellent refractive outcomes in post-LASIK cataract eyes; however, its use is limited by its cost and availability.**
- **Our study demonstrates that the ASCRS IOL calculator, specifically the Average IOL Power, Masket, Modified Masket, Shammas, and the Haigis-L formulae are highly predictable and are a low cost alternative to intraoperative aberrometry.**

Conclusions

- **Our study demonstrates that implantation of multifocal posterior chamber IOLs in the post-LASIK eye can result in significantly improved reading vision even when placed monocularly.**
- **Implantation of toric posterior chamber IOLs resulted in a significant reduction of preoperative astigmatism.**
- **Inaccuracies in IOL calculations in the post-LASIK cataract eye resulted in a high rate of excimer laser enhancement postoperatively.**