


Retrospective Comparison of
Accuracy of Standard Preoperative
IOL Calculations Versus
Intraoperative Calculations Using
Wavefront Aberrometer



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Study Design



- ❧ Retrospective chart review of patients who had the ORA used during their surgery from January 2012 through January 2013
 - ❧ Exclusion criteria
 - ❧ post-op BCVA worse than 20/25
 - ❧ surgeon chose a lens other than recommended by either the IOL Master or ORA system
- ❧ Primary Outcome
 - ❧ How close was the patients postop refraction to the target refraction?
 - ❧ Is the patient 20/25 or better uncorrected?

All Patients

- ∞ The ORA system was utilized on 179 eyes
 - ∞ 46 of these were excluded
- ∞ 36 patients are post refractive
 - ∞ 25 post LASIK
 - ∞ 11 post RK

All Patients

- ∞ Average post op: 55 days (median 34.5 days)
- ∞ Decision
 - ∞ IOL Master Chosen: 34%
 - ∞ Includes surgeon manipulation of IOL master data using standard post refractive calculations.
 - ∞ ORA Chosen: 40%
 - ∞ Surgeon chose the middle (excluded): 25.7%

All Patients

isDecision ORA				
isDecision_ORA	Frequency	Percent	Cumulative Frequency	Cumulative Percent
IOL Master Chosen	61	34.08	61	34.08
ORA Chosen	72	40.22	133	74.30
ORA confirms IOL Master	46	25.70	179	100.00

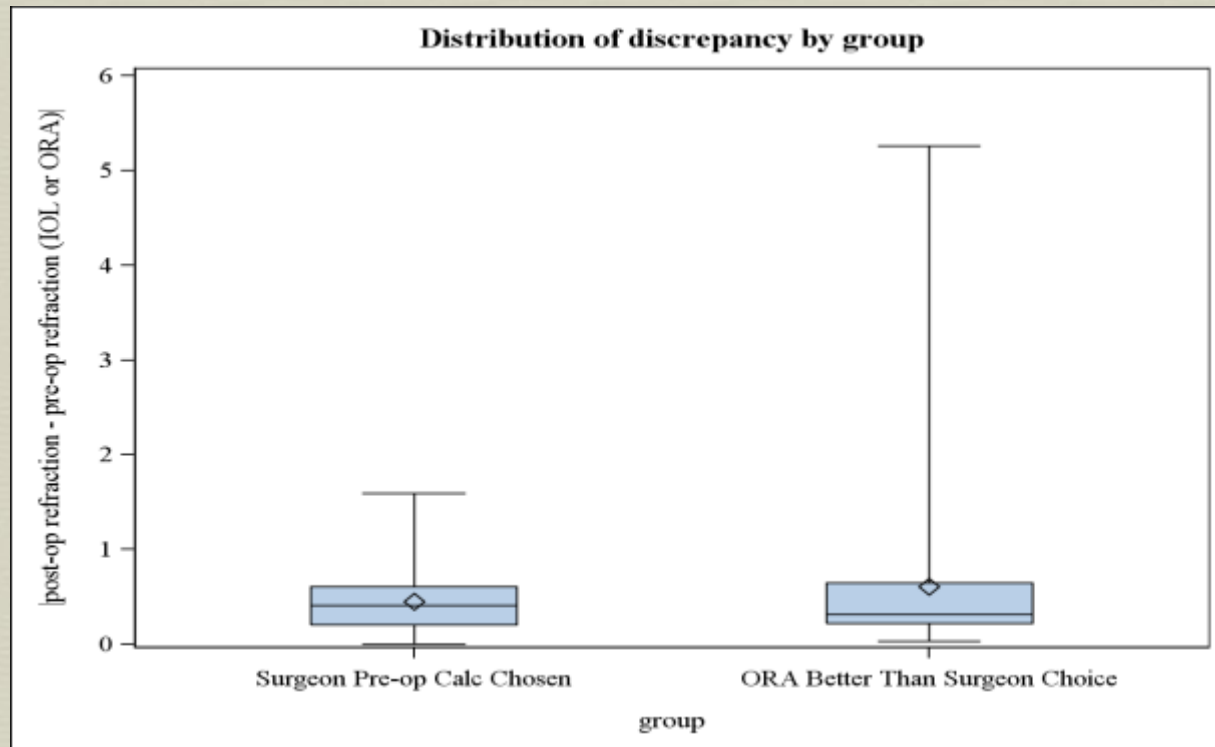
The three groups do not differ in median outcome variable ($|$ postop refraction – target refraction $|$) with a p-value of 0.72 using the Kruskal-Wallis test.

Outcome: Refractive Error

Analysis Variable : discrepancy post-op refraction – predicted post-op refraction (IOL or ORA)							
group	Obs	N	Minimum	Mean	Median	Maximum	Std Dev
IOL Master Chosen	61	57	0.00	0.45	0.41	1.60	0.34
ORA Chosen	72	69	0.03	0.60	0.32	5.26	0.79

The primary outcome of interest is the absolute difference between post-op refraction and pre-op refraction (IOL master/ORA). Each patient contributed 1 refractive error measure, either from IOL Master or ORA, depending on which one was chosen.

Outcome: Refractive Error



No difference in median error ($p=0.94$,
Wilcoxon rank-sum test).

Outcome: Post-op UCVA (Is vision 20/25 or better?)

Table of group by PostOpVA1			
group	PostOpVA1(Is vision 20/25 or better)		
	no	yes	Total
Surgeon Pre-op Calc Chosen	22 36.67	38 63.33	60
ORA Better Than Surgeon Choice	33 45.83	39 54.17	72
Total	55	77	132
Frequency Missing = 1			

The proportion of patients with vision 20/25 or better does not differ between the 2 groups ($p=0.29$, Chi-square test).

What About Visual Acuity?

- ∞ Who is better at predicting post-op refraction?
 - ∞ There was no statistically significant difference between IOL Master and ORA in terms of predicting post-op refraction
- ∞ Is visual acuity better than 20/25 uncorrected?
 - ∞ Entire group: no difference
 - ∞ Post-Lasik: no difference
 - ∞ Post RK: no difference

Conclusions



- ✧ ORA is as good as IOL Master at selecting a lens
- ✧ Although statistically there is no difference in post op refraction and post op visual acuity between the groups it seems that we believe that the ORA is better
 - ✧ The ORA selected lens was chosen 40% of the time
 - ✧ 72% in post refractive patients
 - ✧ 64% in post-RK
 - ✧ 80% in post-LASIK patients

Limitations

- ❧ Retrospective study
- ❧ Reliance on the nurses correct input of surgeon's choice on the lens and the pre-op refractive goal
- ❧ We did not look at which calculation was used (i.e. SRK-T, Hoffer-Q, Holliday)
- ❧ Difference in patient population using ORA vs IOL Master
- ❧ Small sample size for post-refractive patients: post-Lasik (n=25), post-RK (n=11)