Reduction in LVC Enhancement Rate after Introducing Intraoperative Aberrometry for Refractive Cataract Surgery

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Purpose

- Background: Laser vision correction (LVC) can enhance results of refractive cataract surgery in cases where the postoperative refractive outcome and uncorrected vision is not as good as desired

- This analysis was conducted to determine whether the introduction of wavefront aberrometry reduced the rate of LVC enhancement after premium IOL procedures.

Methods

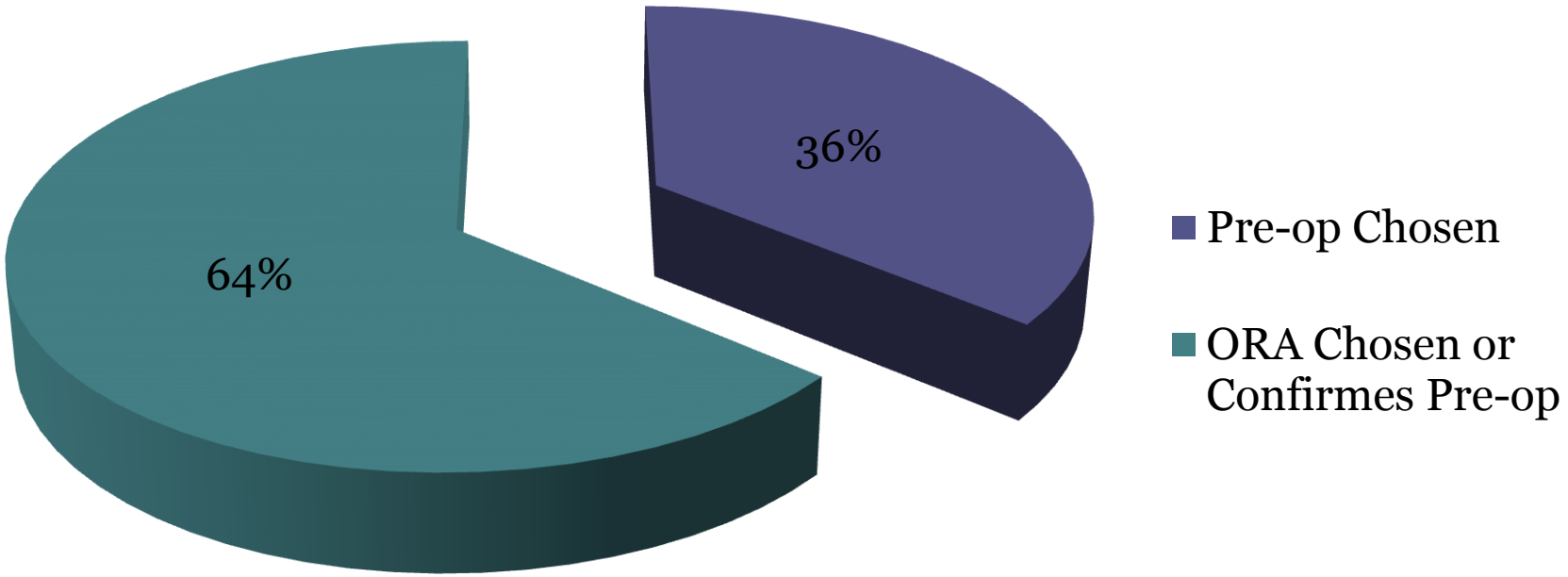
- One surgeon
- Retrospective analysis to determine the actual rate of enhancement after premium IOL (multifocal, accommodating, or toric) surgery in cases classified into two groups
  - Group 1: Cases performed prior to the introduction of intraoperative wavefront aberrometry (N=463)
    - Cases performed between January 2012 and August 2012
  - Group 2: Cases performed after the introduction of intraoperative wavefromt aberrometry (ORA System®, WaveTec Vision) (N= 516)
    - Cases preformed between September 2012 and August 2013
  - Enhancements are typically performed at 6 weeks postop.
- Supportive data analysis includes
  - The percentage of time intraoperative aberrometry measurement led to a change in the IOL power implanted
  - Comparison of prediction error for a subset of consecutive cases from each group
  - Comparison of uncorrected visual acuity at 1 month for a subset of consecutive cases from each group

Results: Enhancement Rates

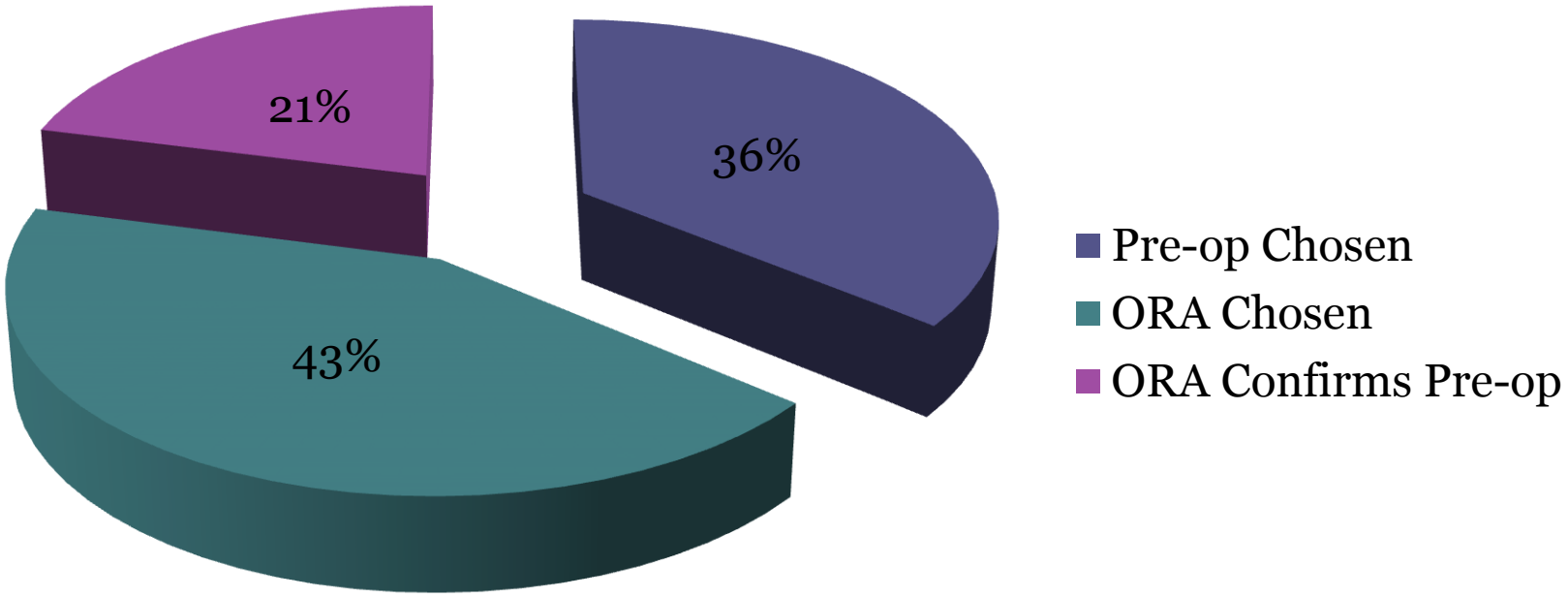
- Group One – Prior to introduction of intraoperative aberrometry – 463 cases
  - 32 cases required LVC enhancement - 7%
- Group 2 – After introduction of intraoperative aberrometry – 516 cases
  - 9 cases required LVC enhancement – 2%

- Overall – **71% reduction** of enhancement rate in premium IOL cases

Results: Intraoperative Decision



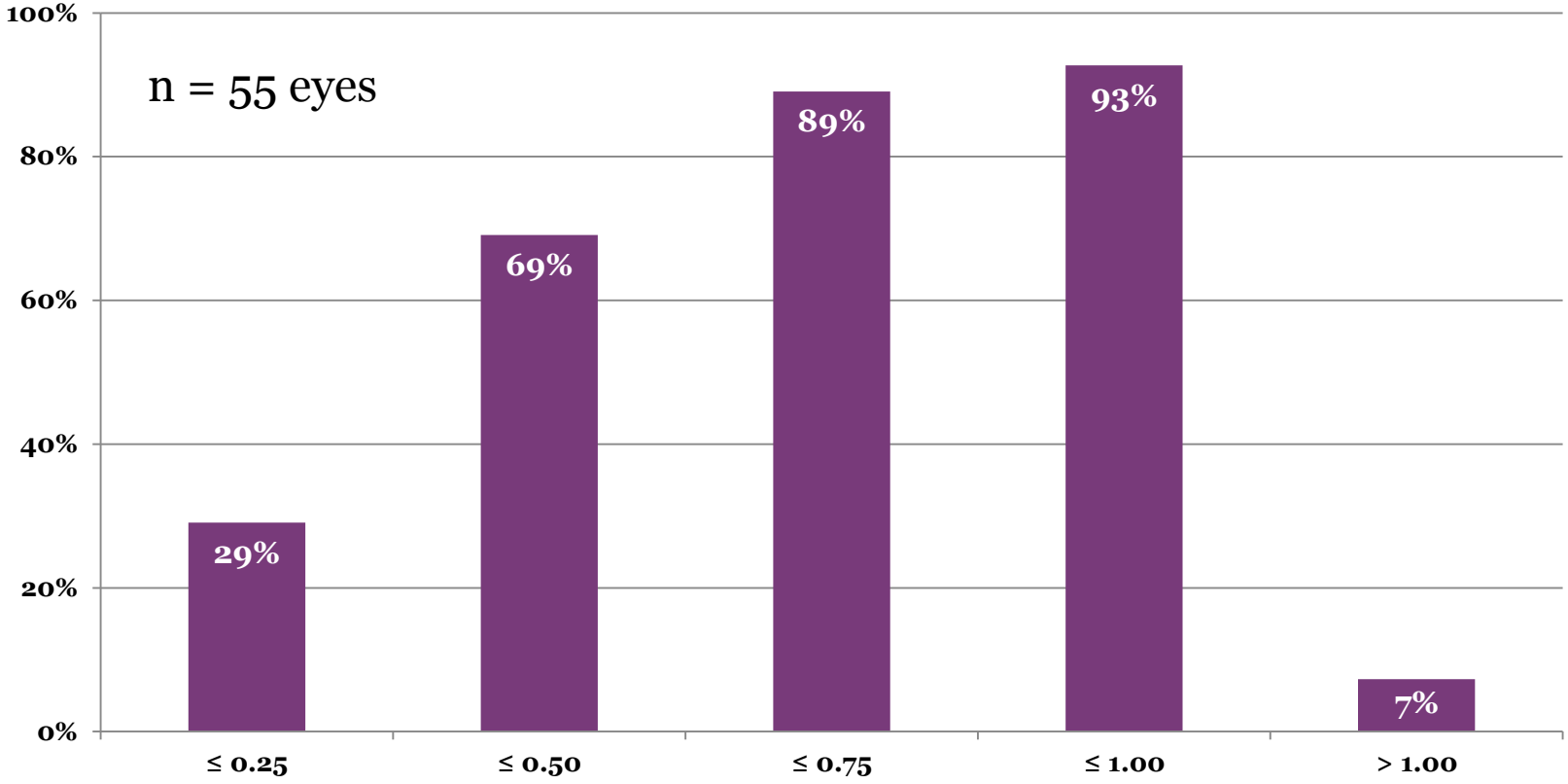
Results: Intraoperative Decision



Uncorrected Distance Visual Acuity (UCDVA)

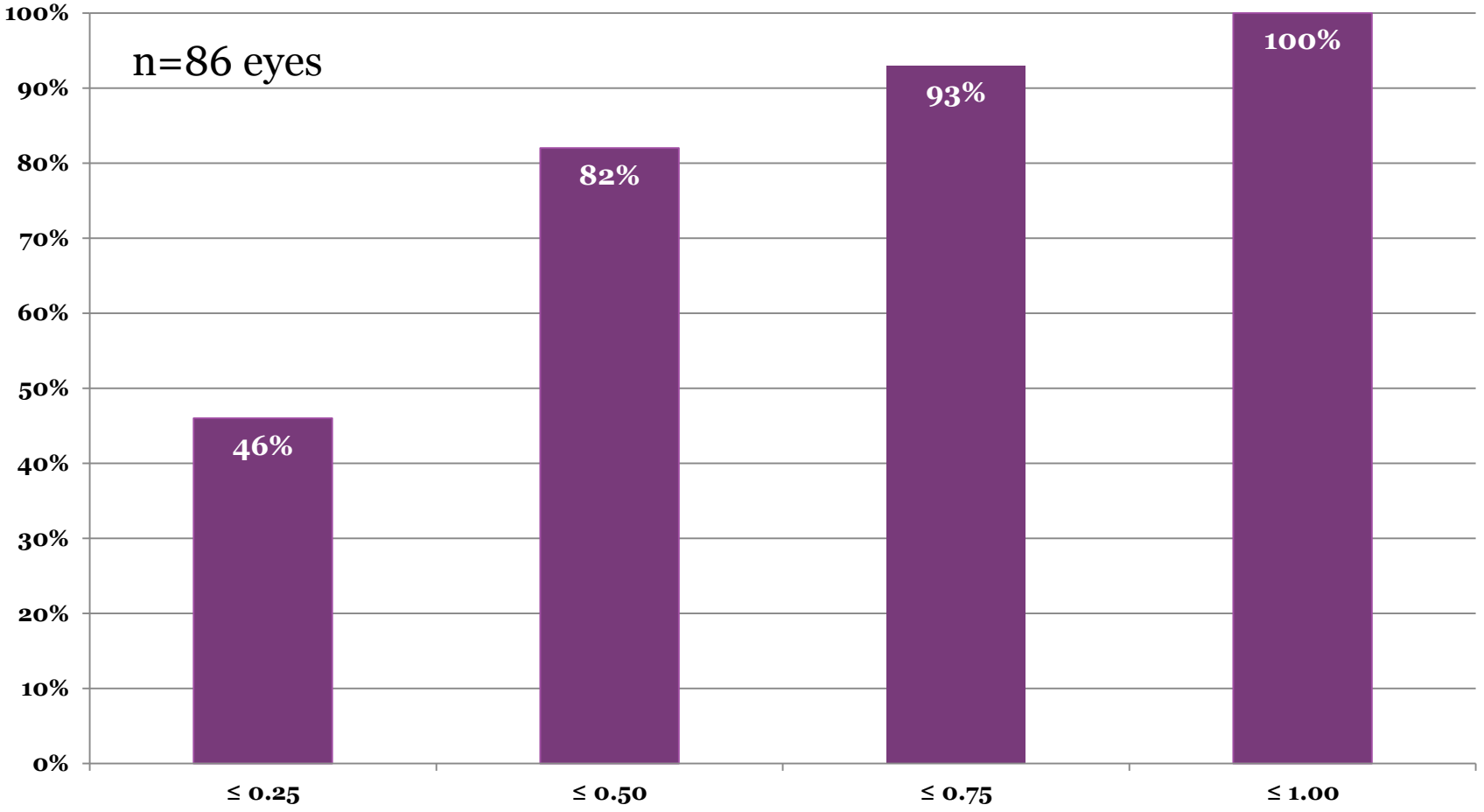
	Mean LogMAR	Standard Dev.	Min	Max
Group 1 n=55	0.17	0.17	-0.12	1.00
Group 2 n = 86	0.10	0.09	0.00	0.30

Mean Absolute Value Prediction Error (MAVPE) and Distribution Group 1



Mean	Standard Deviation	Min	Max
0.42 D	0.31 D	0.01 D	1.34 D

Mean Absolute Value Prediction Error (MAVPE) and Distribution Group 2



Mean	Standard Deviation	Min	Max
0.31 D	0.23 D	0.01 D	0.97 D

Summary

- Enhancement rates in premium IOL cases decreased significantly after incorporating Intraoperative aberrometry
- Supportive data analysis set demonstrated improved UCDVA in the intraoperative aberrometry group
  - Difference in mean acuity is statistically significant ($p<0.03$)
- Supportive data analysis set demonstrated a reduction in prediction error (MAVPE) and a higher proportion of eyes within 0.50 D of predicted post-op SE in the intraoperative aberrometry group
  - Difference in prediction error is statistically significant ($p<0.01$)

Conclusion

- While successful, LVC enhancement after premium IOL surgery increases risk, expense, and time commitment for surgeon and patient and decreases patient satisfaction. In this private practice setting, the incorporation of intraoperative aberrometry significantly reduced the rate of LVC enhancement by 71%.