Assessment of Early Visual Outcomes Following Premium IOL Implantation with Femto-Created Arcuate Incisions

Presented by: Taylor Strange, DO
Alliance Vision Institute
Fort Worth, TX

DISCLOSURES

- LENSAR
- RxSight

INTRODUCTION

- The light adjustable lens (LAL) is an intraocular lens (IOL) that provides noninvasive postoperative adjustment to the lens power, correcting both residual sphere and cylinder.
- Controlled application of 365 nm ultraviolet light activates photosensitive molecules in the IOL to adjust the spherocylindrical power.
- However, multiple postoperative treatment adjustments are required to adjust the spherocylindrical power for the desired refraction before treatment lock.
- Correcting pre-existing astigmatism using femtosecond laser arcuate keratotomy (AK) has been hypothesized to reduce the number of adjustments needed postoperatively.
- This study examines the outcomes of a combined dual modality femtosecond laser-assisted arcuate keratotomy and implantation of LAL+ in patients undergoing cataract surgery.

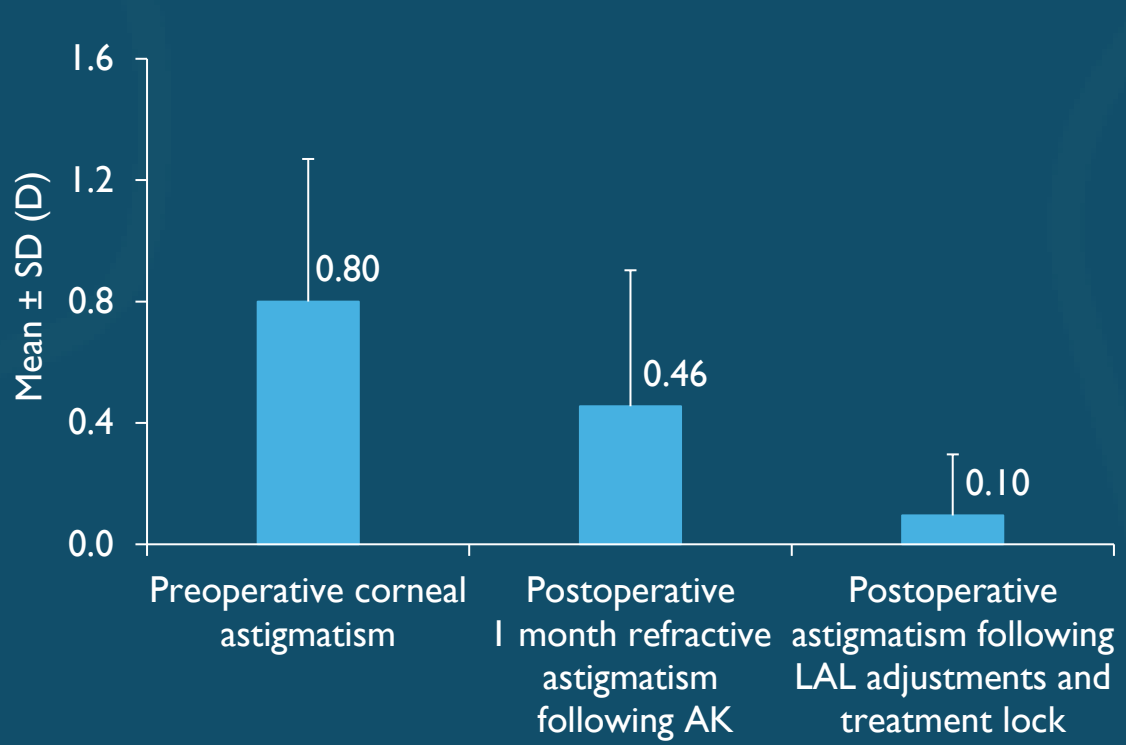
PURPOSE

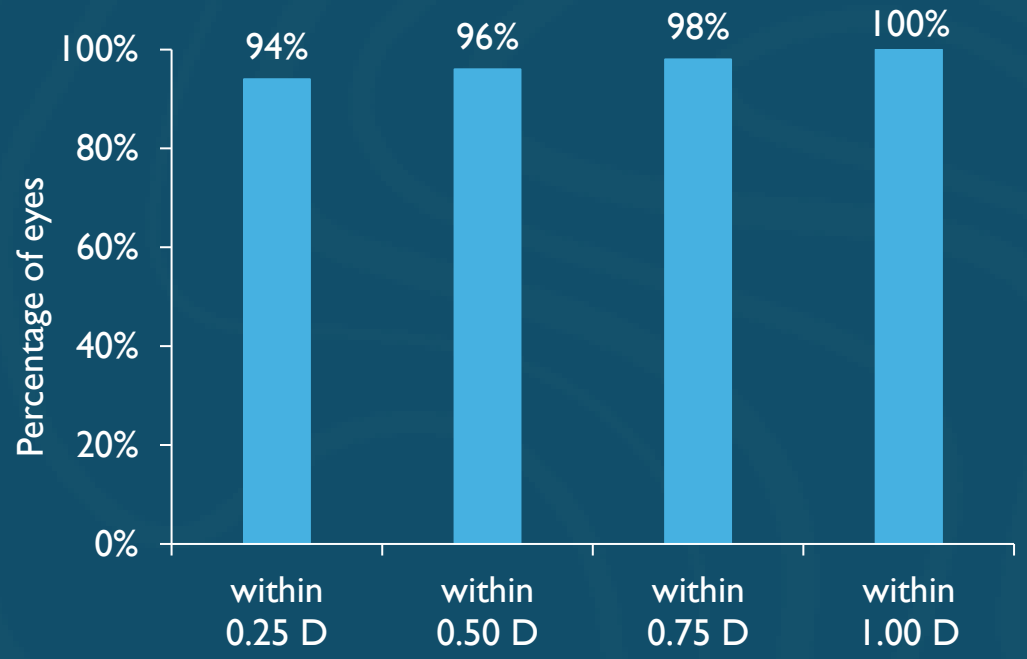
- To evaluate the visual and refractive outcomes following dual pulse laser-assisted cataract surgery and arcuate keratotomy for astigmatism correction in patients receiving a premium intraocular lens.

METHODS

Study Design	Retrospective study.
Study Procedure	Case records of 50 patients (50 eyes) who had undergone femtosecond arcuate incisions for treatment of astigmatism (ALLY, LENSAR) and implantation of LAL+ IOL (Rx Sight) were reviewed. None of the subjects had a history of corneal surgery and corneal pathology.
Outcome Measures	Uncorrected visual acuity at distance and near; number of light delivery device treatments; percentage eyes with residual astigmatism ≤0.25, ≤0.50, ≤0.75, ≤1.0 D; percentage dioptric reduction in astigmatism.

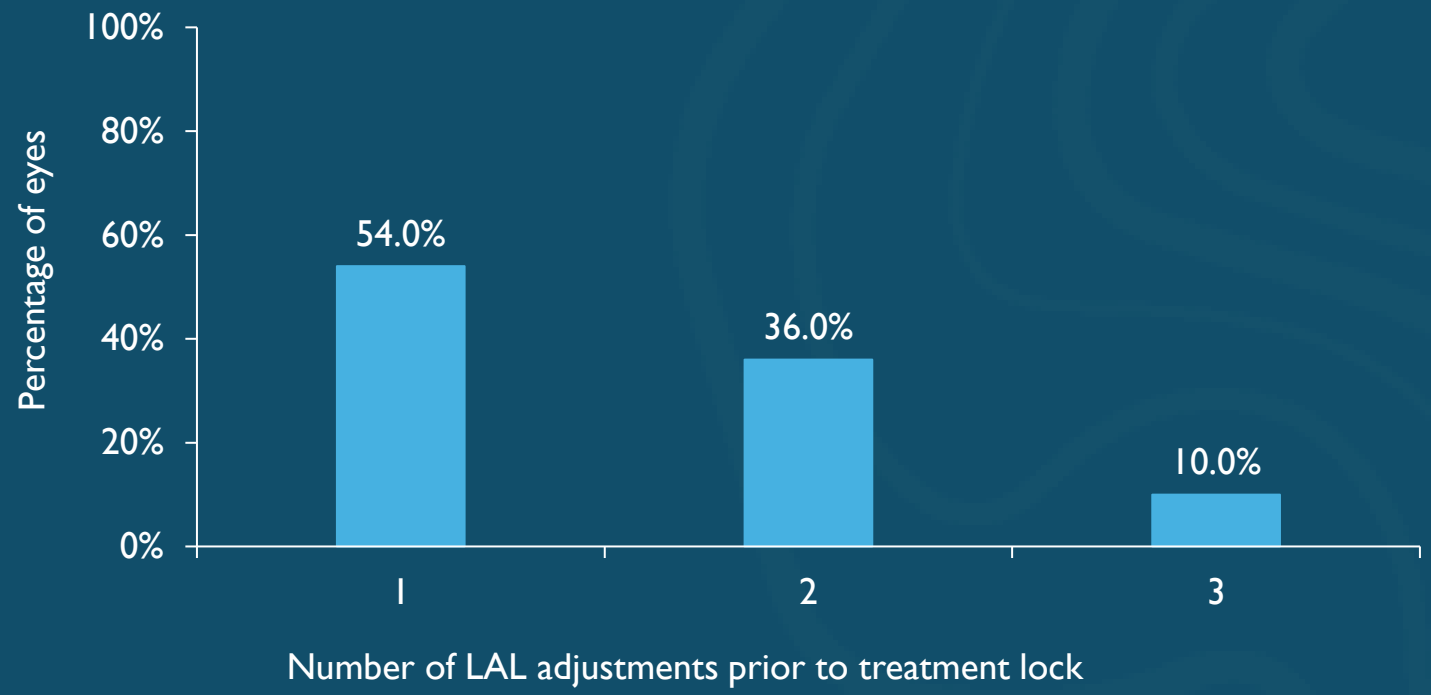
RESULTS: ASTIGMATISM





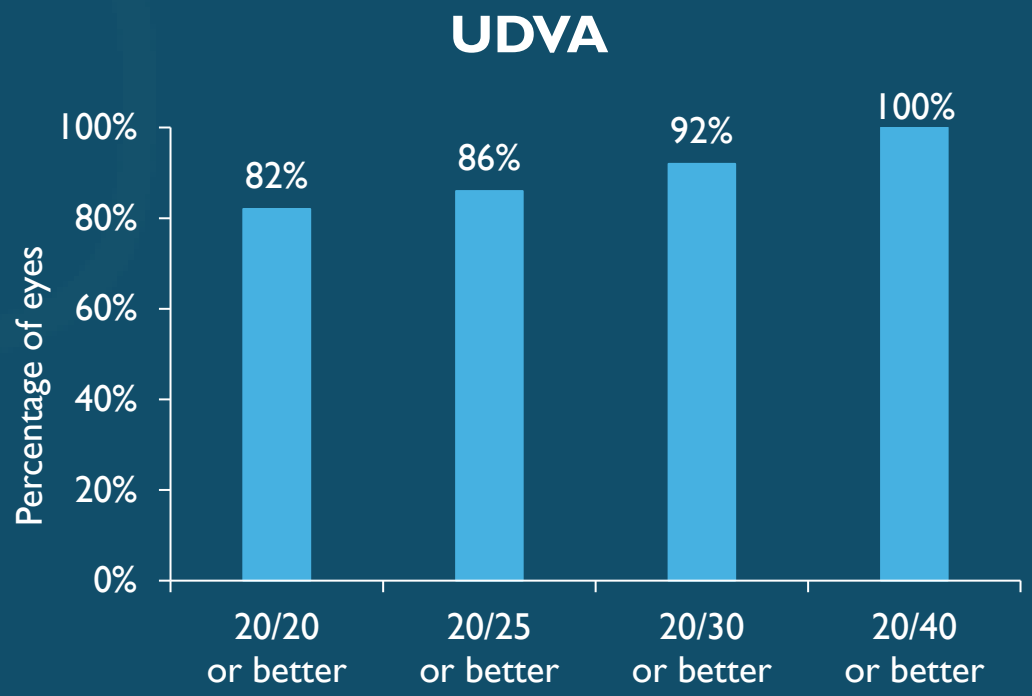
- Astigmatism was reduced by 0.34 D following arcuate keratotomy and 0.36 D following LAL adjustments.
- Following the combined procedure of LAL implantation and arcuate keratotomy, the residual refractive cylinder was within 0.50 D and 1.00 D in **96%** and **100%** of eyes, respectively.

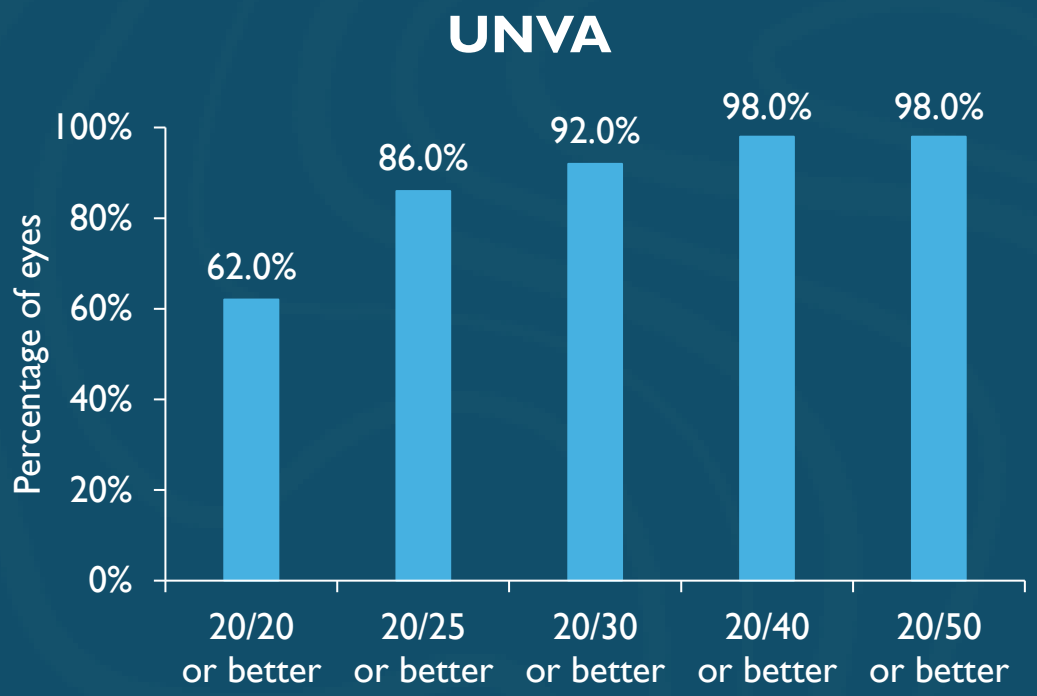
RESULTS: NUMBER OF TREATMENTS



- The mean number of light delivery device treatments was 1.56.
- More than 50% of patients required only one treatment adjustment prior to treatment lock.

RESULTS: UDVA AND UNVA AT ONE MONTH

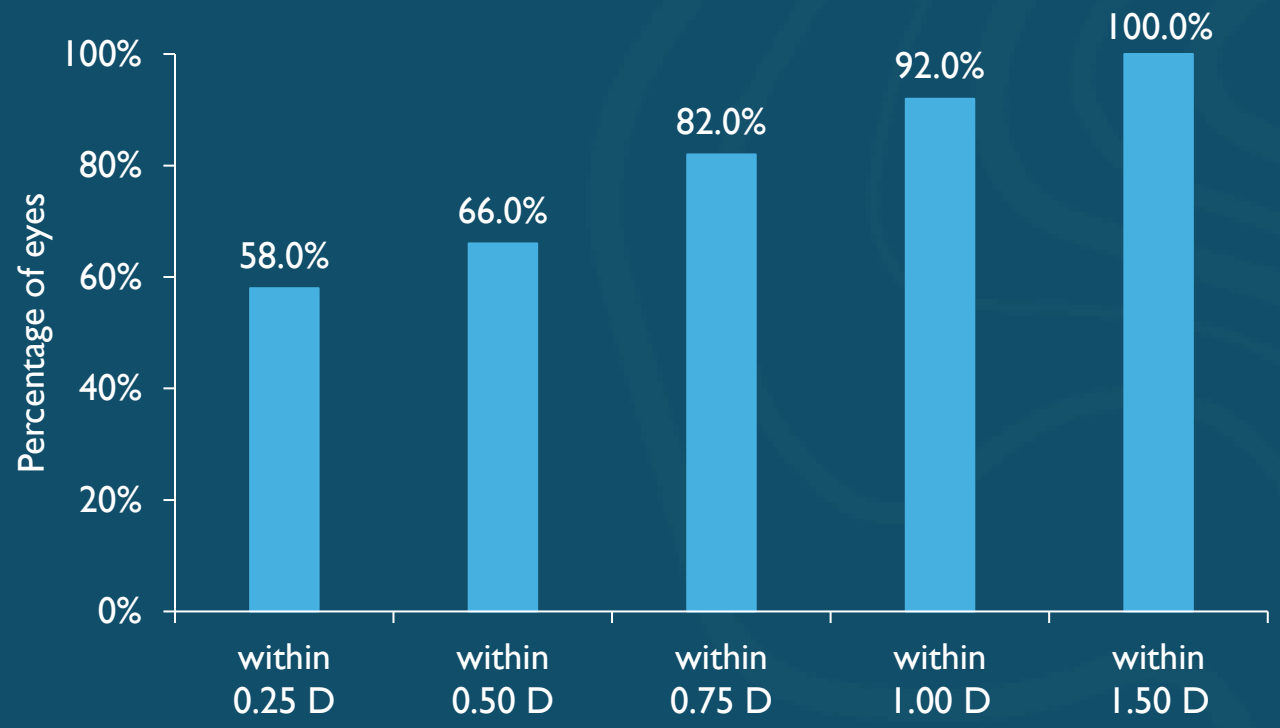




Following the combined procedure of LAL treatments and arcuate keratotomy:

- UDVA was 20/25 or better in 86% of eyes and 20/30 or better in 92% of eyes, respectively.
- UNVA was 20/40 or better in 98% of eyes.

RESULTS: MRSE



- The mean MRSE was -0.29 ± 0.52 D, with 66% and 92% of eyes achieving MRSE within 0.50 D and 1.00 D, respectively.

DISCUSSION

- Standard AK incisions are usually made perpendicular to the corneal surface, which leads to wound gaping.
    - The epithelial plug that fills the gap is replaced by a fibrotic scar, inducing wound contraction over time and reducing the effect of AK.
- The LENSAR femtosecond laser creates AK incisions that are perpendicular to the coronal plane. This allows the anterior cornea to slide forward in relation to the posterior cornea.
    - The realigned stroma heals without wound gaping or formation of an epithelial plug., reducing the risk of astigmatism regression.
- Studies evaluating the outcomes of beveled incisions created with LENSAR laser have reported excellent astigmatic outcomes that were stable over the follow-up period of 1 year.[1,2]

1. Visco et al., *J Cataract Refract Surg*, 2019; 2. Weinstock. Comparison of regression of femtosecond laser arcuate incisions for astigmatism correction at the time of cataract surgery. Presented at ASCRS annual meeting, 2022.

DISCUSSION

- The combined procedure of LAL implantation and AK with ALLY femtosecond laser reduced the number of treatment adjustments following cataract surgery, yielding good visual, refractive, and astigmatic outcomes postoperatively.
    - Following the combined procedure of arcuate keratotomy and LAL adjustments, there was **88.1%** reduction in astigmatism.
    - The average number of LAL adjustments following AK was **~1.5**, and more than half of the patients required only one treatment adjustment to achieve the desired refraction.

THANK YOU