

Refractive outcomes of Implantable Collamer Lens (ICL) surgery based on the Lenstar LS900® keratometer

Michael Penny¹, Alison Harapiak², Alison Maddigan², Jamie Bhamra³

¹Cumming School of Medicine, University of Calgary

²Vector Eye Centre, Calgary

³Division of Ophthalmology, Department of Surgery, University of Calgary

Background and Purpose

- Surgical planning for implantable collamer lens (ICL) surgery relies on a keratometer which provides precise measurements of the anterior corneal curvature for accurate selection of lens power and astigmatism.
- The main source of error when using toric intraocular lenses is often due to imprecise preoperative measurements of corneal curvature, especially in eyes with low astigmatism.¹

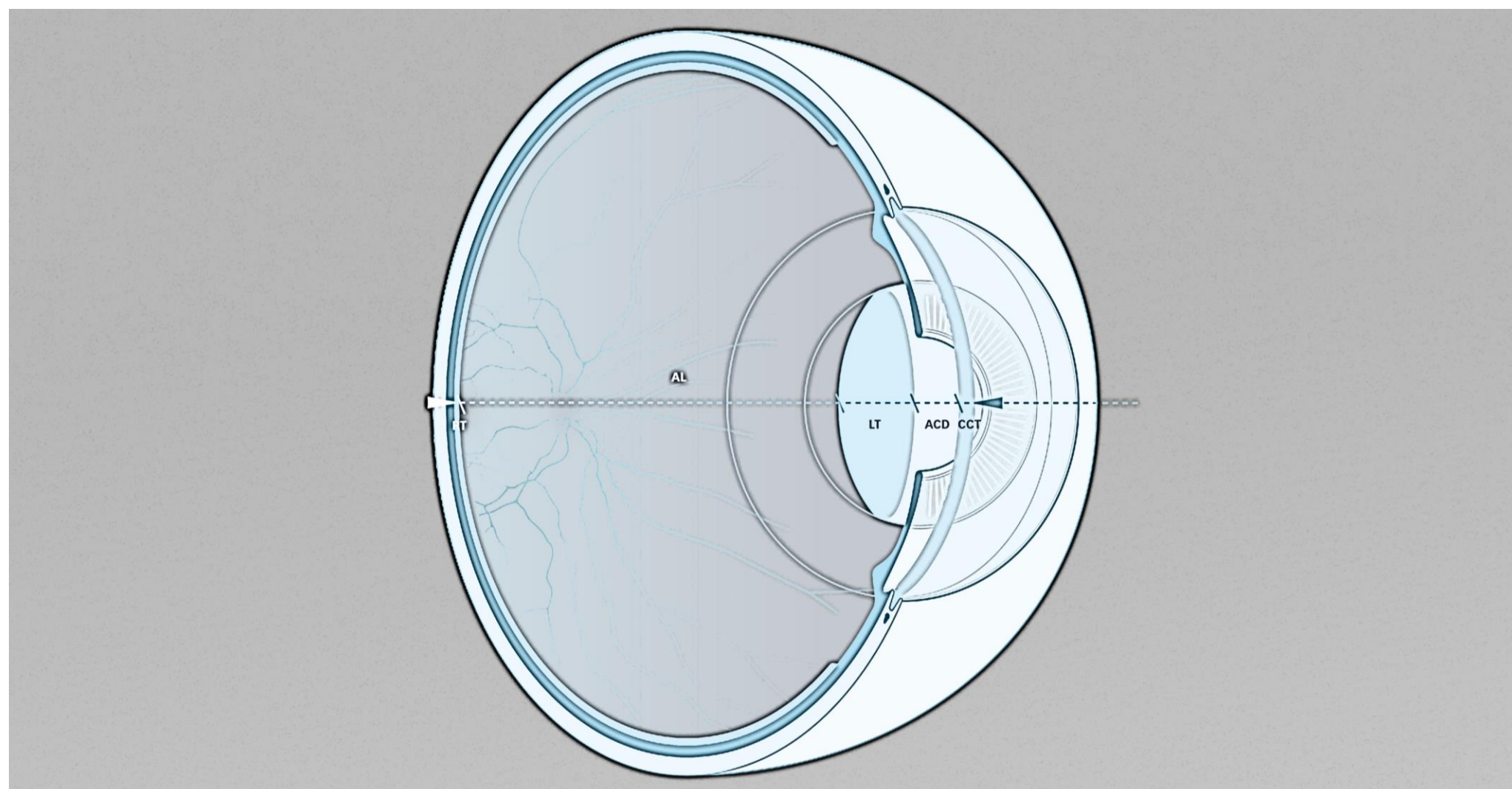


Image 1 – Eye cross section with biometric measurements²

- This study is a retrospective chart review assessing clinical outcomes of patients undergoing ICL surgery with utilization of the Lenstar LS900® (Lenstar LS 900, HAAG-STREIT AG, Switzerland) keratometer for ICL calculations.

Methods

- Twenty-six eyes of thirteen patients underwent ICL surgery between May 2019 and January 2021, with surgical planning and lens selection calculations based on Lenstar keratometry measurements.
- Patient baseline characteristics, visual acuity, refractive data, and corneal measurements were recorded preoperatively and at the 2-week postoperative follow up visit.

Results

Baseline characteristics	
Number of eyes, n	26
Number of patients, n	13
Age (years), mean (SD)	35.3(5.04)
Female, n (%)	7(53.85%)
Spherical ICL, n (%)	6(23.08%)
Toric ICL, n (%)	20(76.92%)
Baseline refractive SEQ (diopters), mean (SD)	-7.48(3.8)
Baseline UCVA (logMAR), mean (SD)	1.82(1.64)
Pre-op central ACD (mm), mean (SD)	3.25(0.31)
Pre-op corneal thickness (mm), mean (SD)	0.534(0.05)
Pre-op White to White (mm), mean (SD)	11.62(0.36)

Figure 1 – Baseline characteristics of included patients. SD = standard deviation; SEQ = Spherical equivalent; logMAR = Logarithm of the Minimum Angle of Resolution; UCVA = uncorrected visual acuity; ACD = Anterior chamber depth

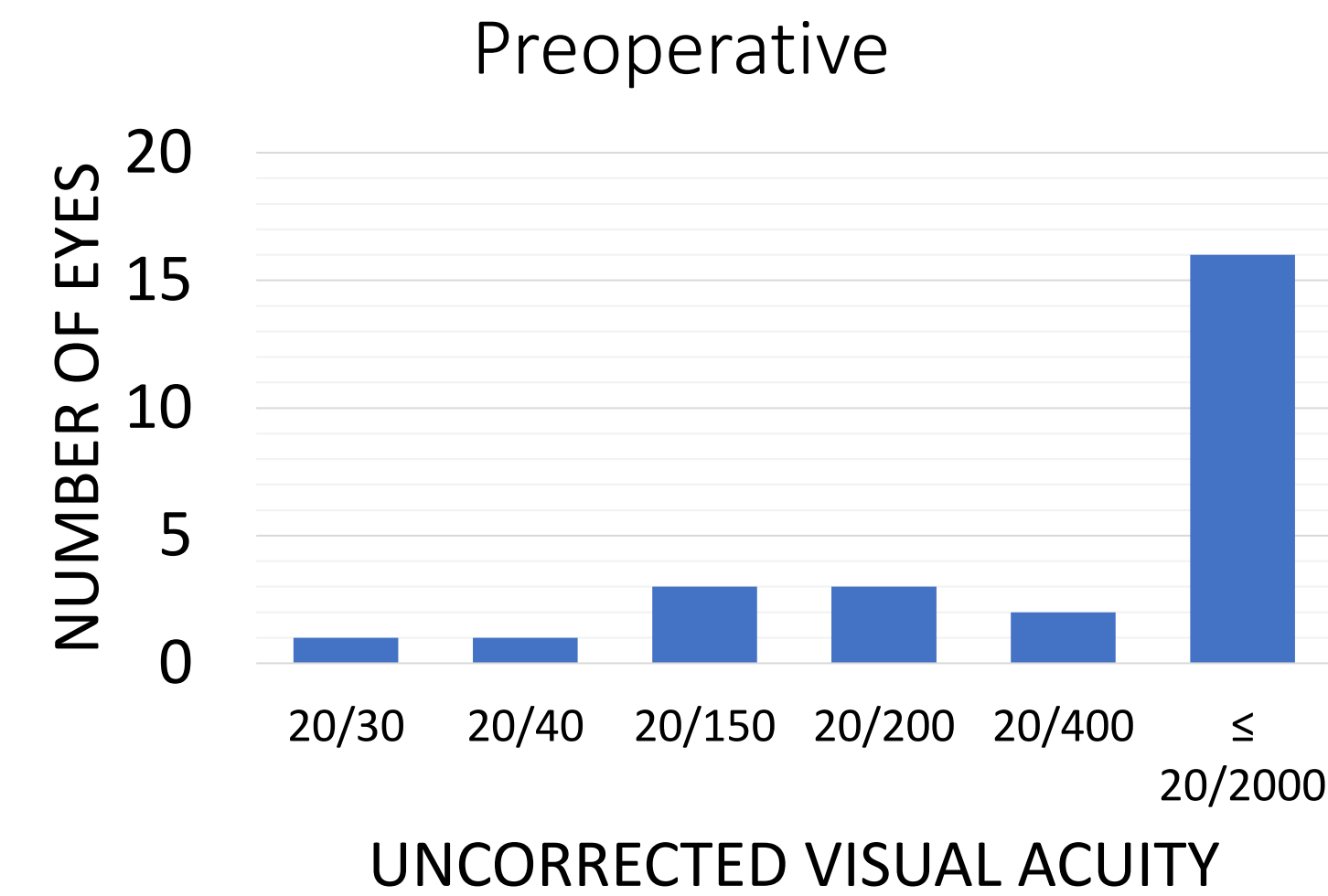


Figure 2 – Preoperative uncorrected visual acuity

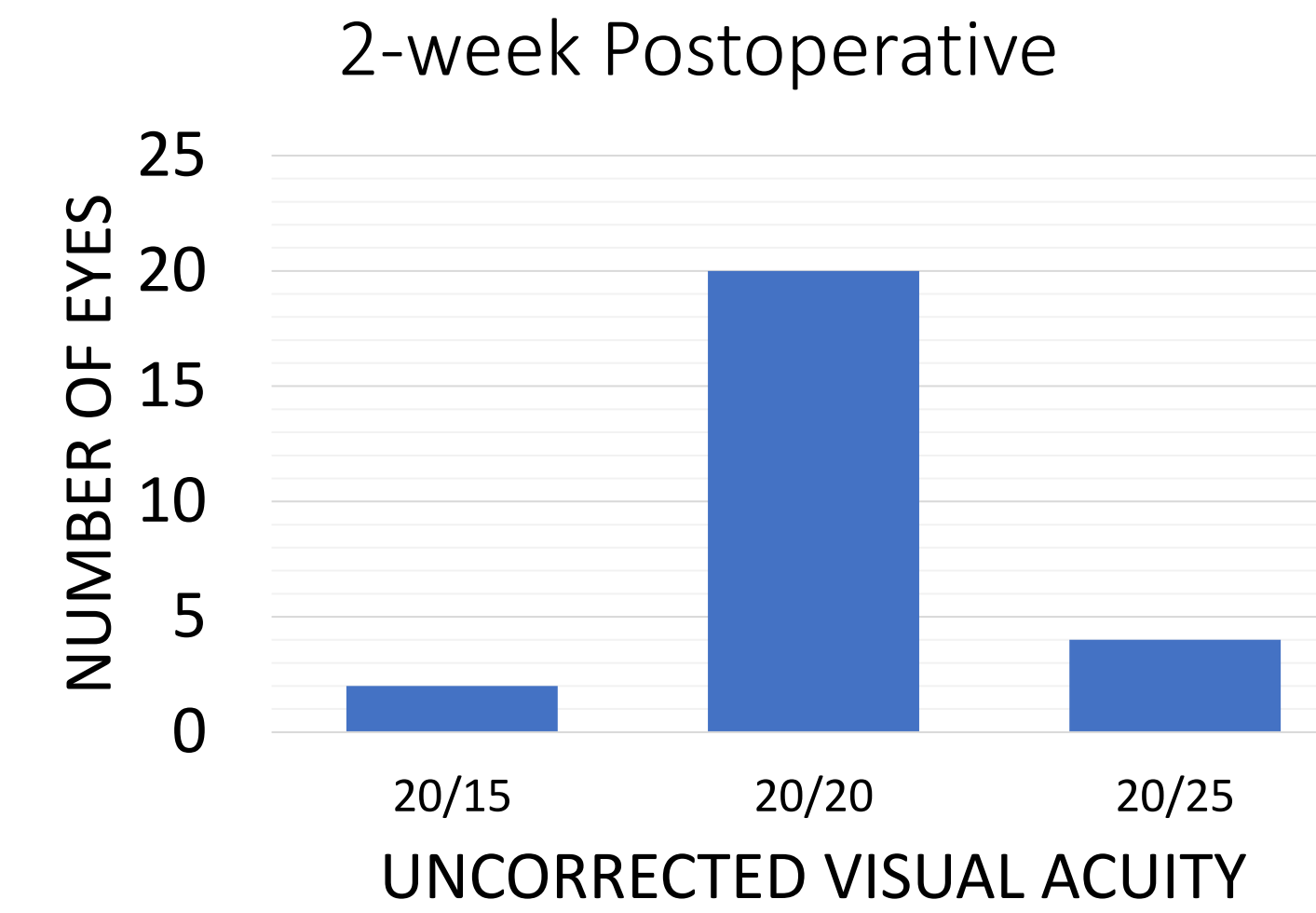


Figure 3 – 2-week postoperative visual acuity

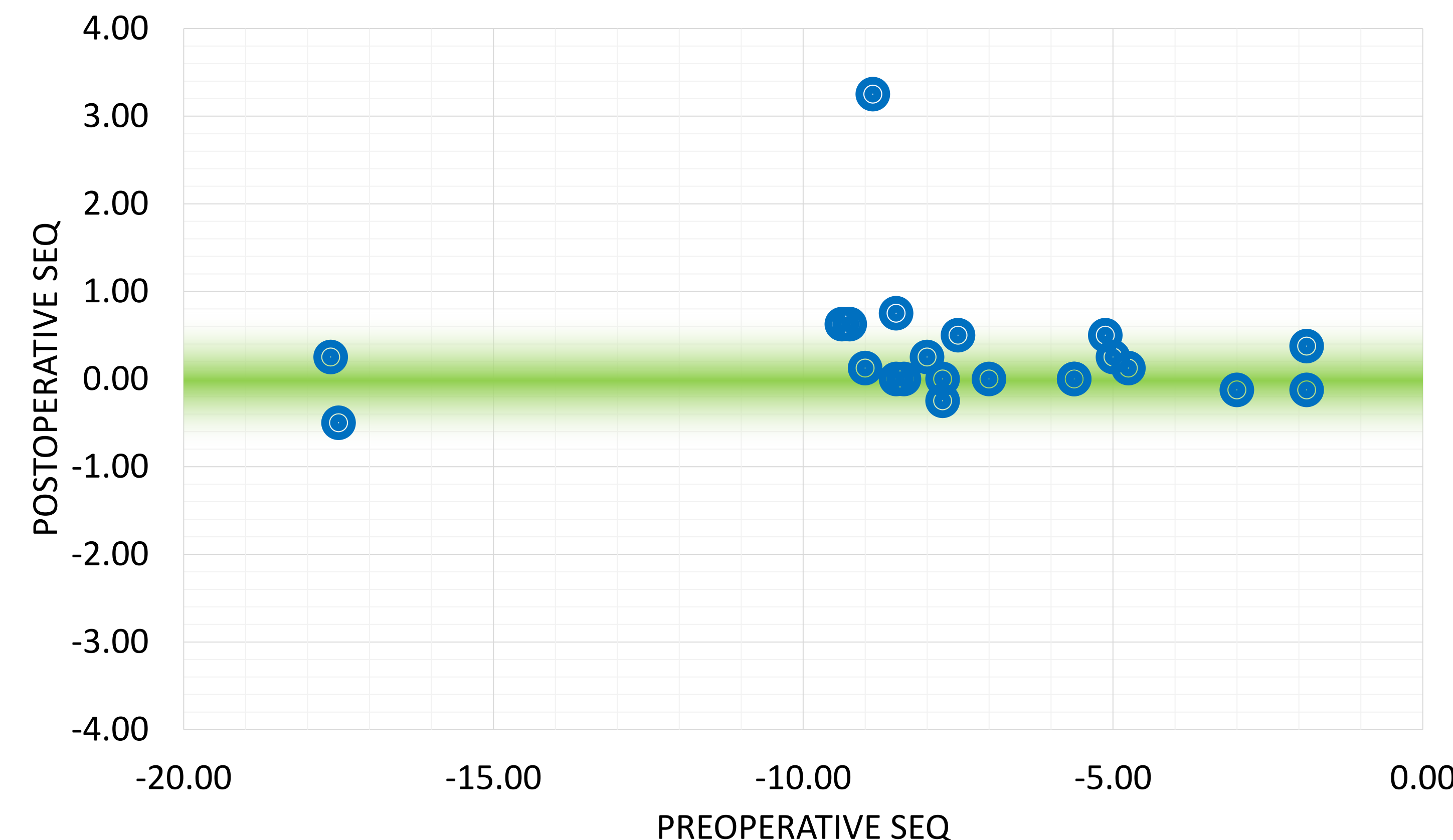


Figure 4 – Preoperative Vs. 2-week postoperative refractive spherical equivalent. SEQ = Spherical equivalent

Safety

- There were no intraoperative complications reported.
- The most common postoperative complaint was the perception of halos, noted in 2/13 (15.4%) of patients.

Discussion and Conclusions

- The mean 2-week postoperative spherical equivalent was $+0.30 \pm 0.71$ D, and the mean UCVA was 0.01 ± 0.06 logMAR.
- Only one patient had a refractive outcome outside of ± 1 diopter and was due to a prior acanthamoeba keratitis with paracentral scar. Postoperative UCVA in that eye still achieved 20/25.
- This study aligns with prior work which revealed similar findings of precise clinical outcomes, and biometric measurement accuracy with use of the Lenstar LS900®.³⁻⁵
- Limitations to this study include a small sample size and a short duration of follow up.
- **These findings support the use of the Lenstar LS900® keratometer for surgical planning in ICL implantation for predictable refractive outcomes and excellent postoperative visual acuity.**

References

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