

Effect of the Base Curve of Silicone Hydrogel Bandage Contact Lenses on Post-PRK Outcomes

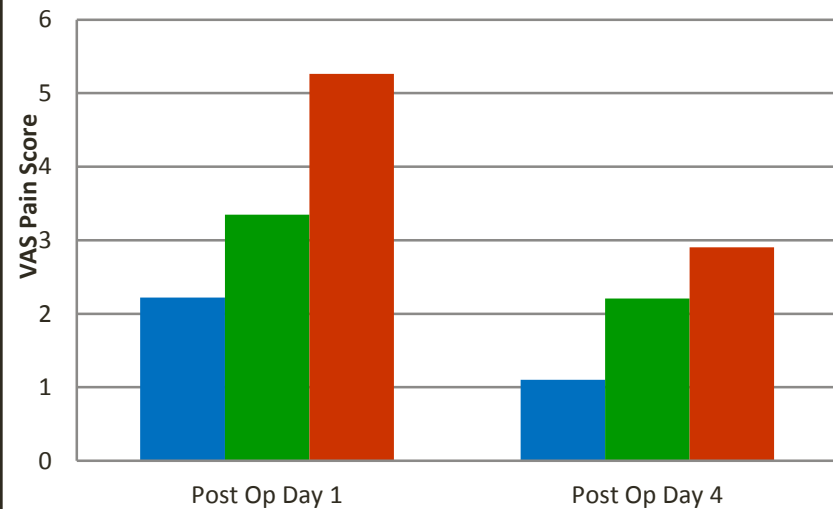
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*Charles D Reilly is currently a consultant for Abbott Medical Optics and Alcon Labs, but he was not at the time the research was conducted. All remaining authors have no financial interests in the subject matter of this presentation.

Background

- Bandage soft contact lenses (BSCs) are routinely used after photorefractive keratectomy (PRK) to mitigate pain.
- A previous study found the Acuvue® Oasys® significantly more comfortable than 2 other common BSCs.

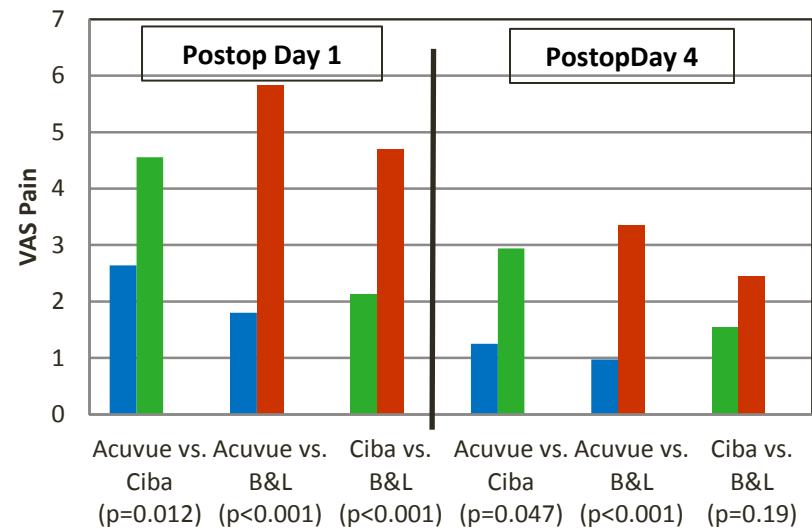
Pooled Absolute Pain Scores



LEGEND

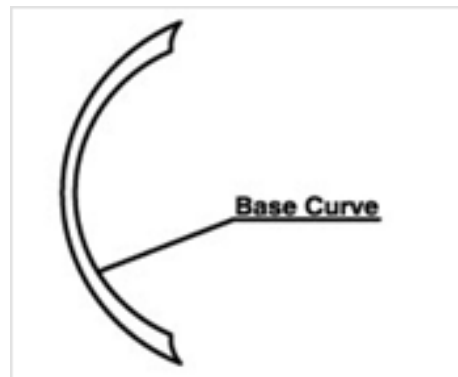
- Acuvue Oasys
- Ciba AirOptix
- B&L Pure-Vision

Absolute Pain Scores



Purpose

- Evaluate relative pain and rate of contact lens loss with two base curvatures (BC) of the Acuvue[®] Oasys[®] BSCL following PRK.
- Refractive lenses customize BC for enhanced vision,^{*} but is this appropriate for pain reduction in BSCLs?
- 8.4 mm vs 8.8 mm
 - Tighter to prevent slippage?
 - Customize fit according to corneal shape?



<http://sambotec.co.kr/en/pages/view/13>

Materials and Methods

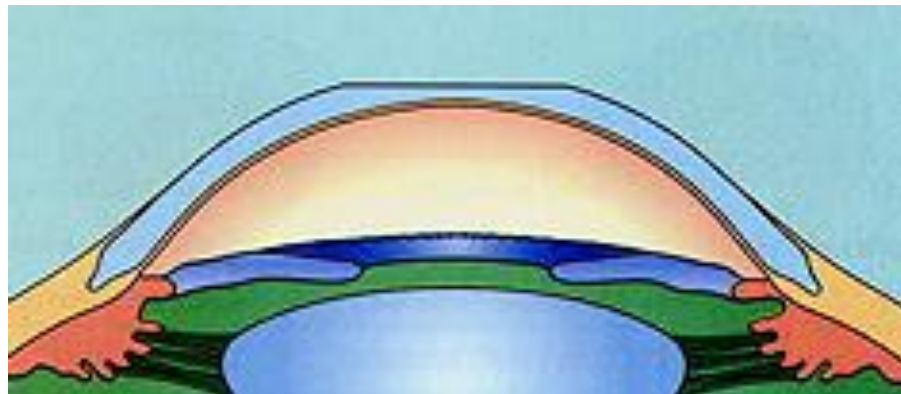
- Randomized, controlled, double masked study containing 140 patients
- Eyes were randomized to receive 8.4 or 8.8 mm BC lenses postoperatively.
- Allegretto® or VISX™ laser choice was surgeon-dependent.
- Discomfort measured on a VAS Pain (0-10) scale at 1 and 4 days postoperatively. This was assessed using a patient questionnaire.

Materials and Methods

- Inclusion criteria:
 - Bilateral primary PRK for myopia
 - Age ≥ 21 at the date of pre-operative evaluation
 - Medically appropriate candidate for PRK
- Soft contact lenses were removed at least thirty days and hard contact lenses at least one month per decade of wear prior to treatment.

Materials and Methods

- Patients stratified according to steep keratometry (K)
 - Pre-op K used to estimate peripheral steepness
 - Only the central cornea is affected by refractive surgery
 - Assume that the pre-op central K reflects the post-op peripheral K
 - Post-op K to estimate central steepness
 - This is the area affected by refractive surgery



<http://www.worldclasslasik.com/new-york-lasik/what-is-prk/>

Data Analysis

- Data was analyzed to reflect the effect of corneal shape on which base curve was most comfortable
- Three separate analyses were performed
 - All patients analyzed together
 - Allegretto laser only (marketed as maintaining a more prolate cornea)
 - VISX laser only (may lead to more oblate corneas)
- Left and right sides of each chart show pre- and postoperative K readings
- Bars reflect patient-reported VAS Pain scores for each BC of the Acuvue Oasys lens.

Figure 1: All Patients: Pain Scores by Preoperative (A) and Postoperative (B) Keratometry Readings for 8.4 vs 8.8 mm BC Acuvue Oasys lens

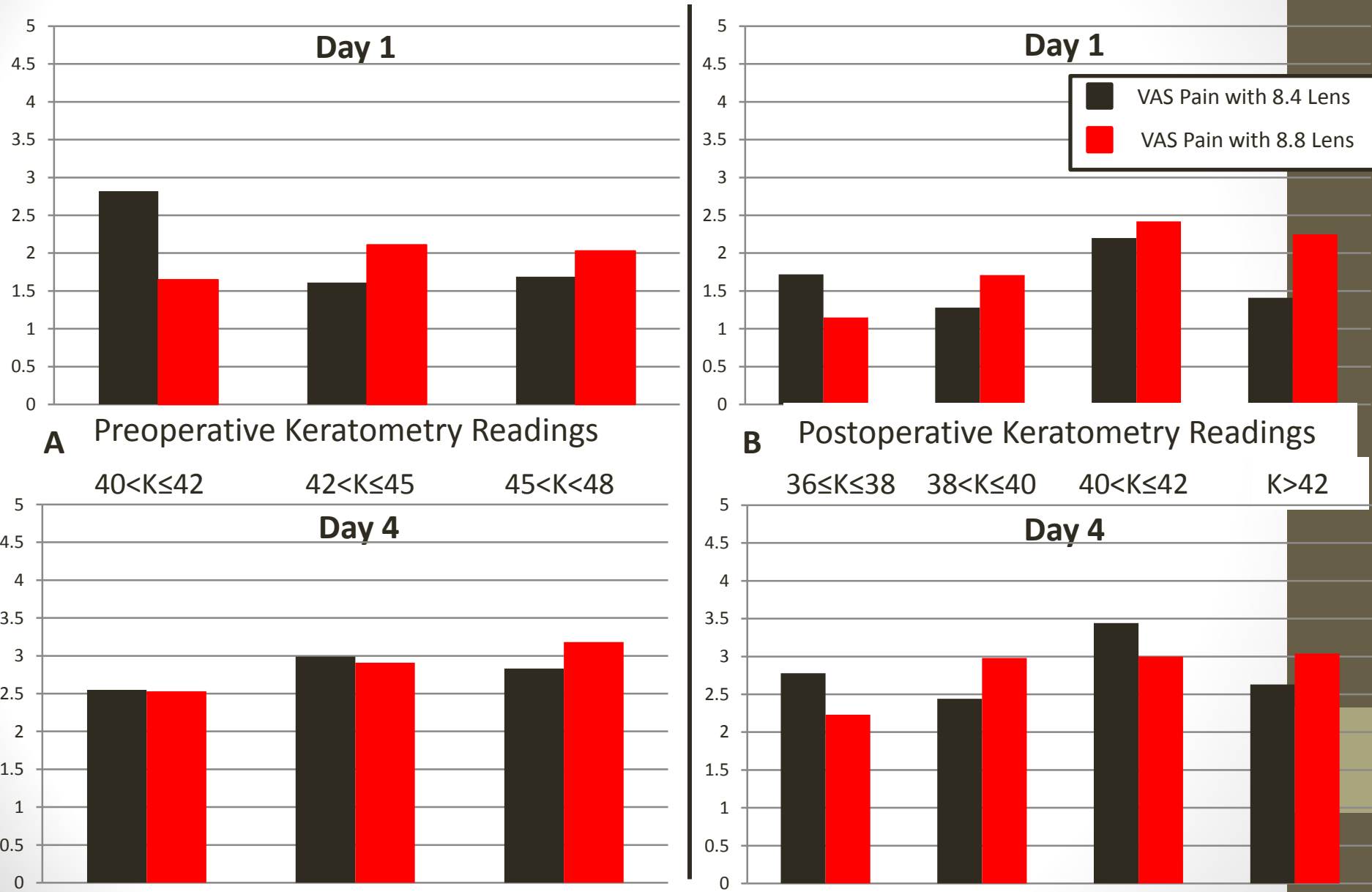


Figure 2: Allegretto Laser: Pain Scores by Preoperative (A) and Postoperative (B) Keratometry Readings for 8.4 vs 8.8 mm BC Acuvue Oasys lens

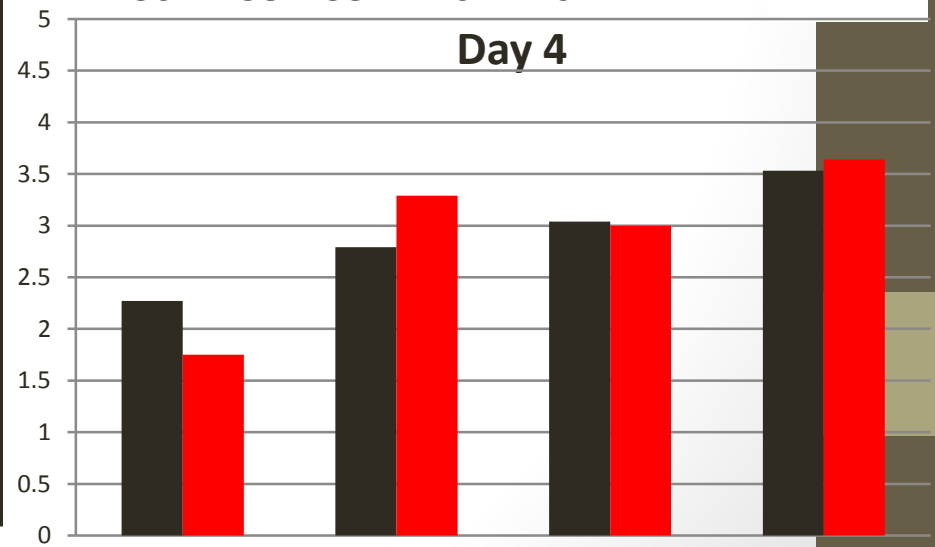
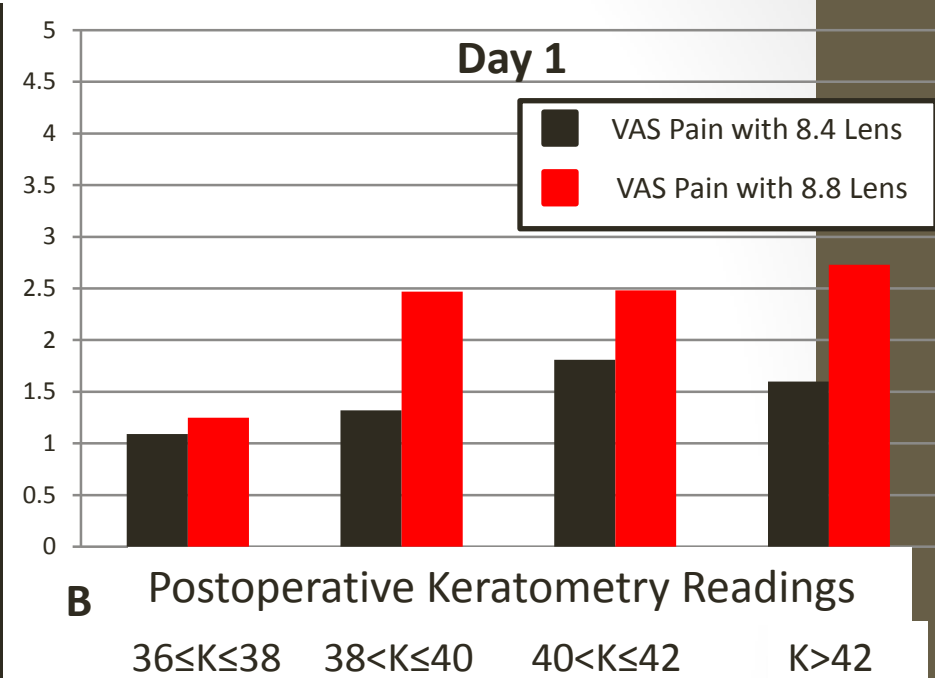
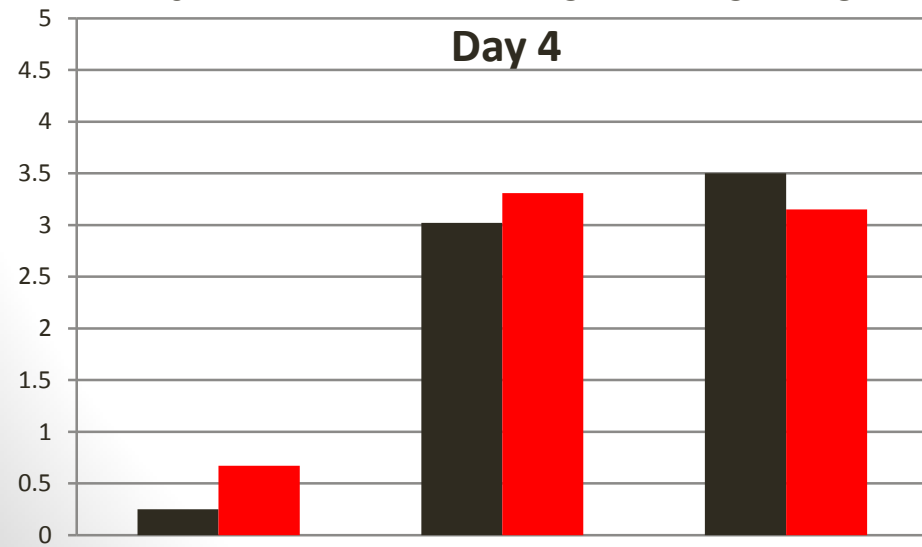
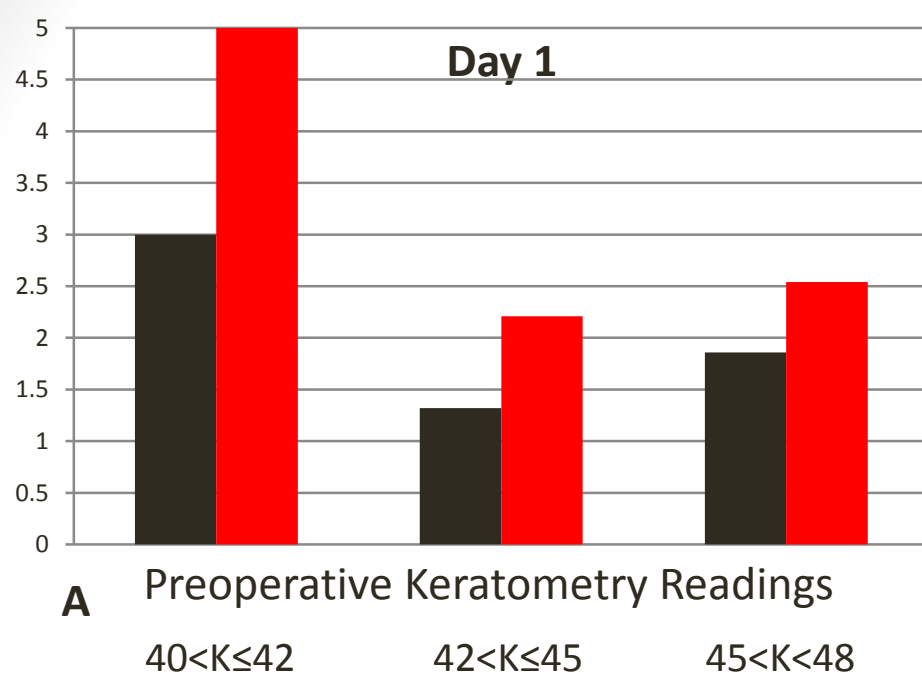
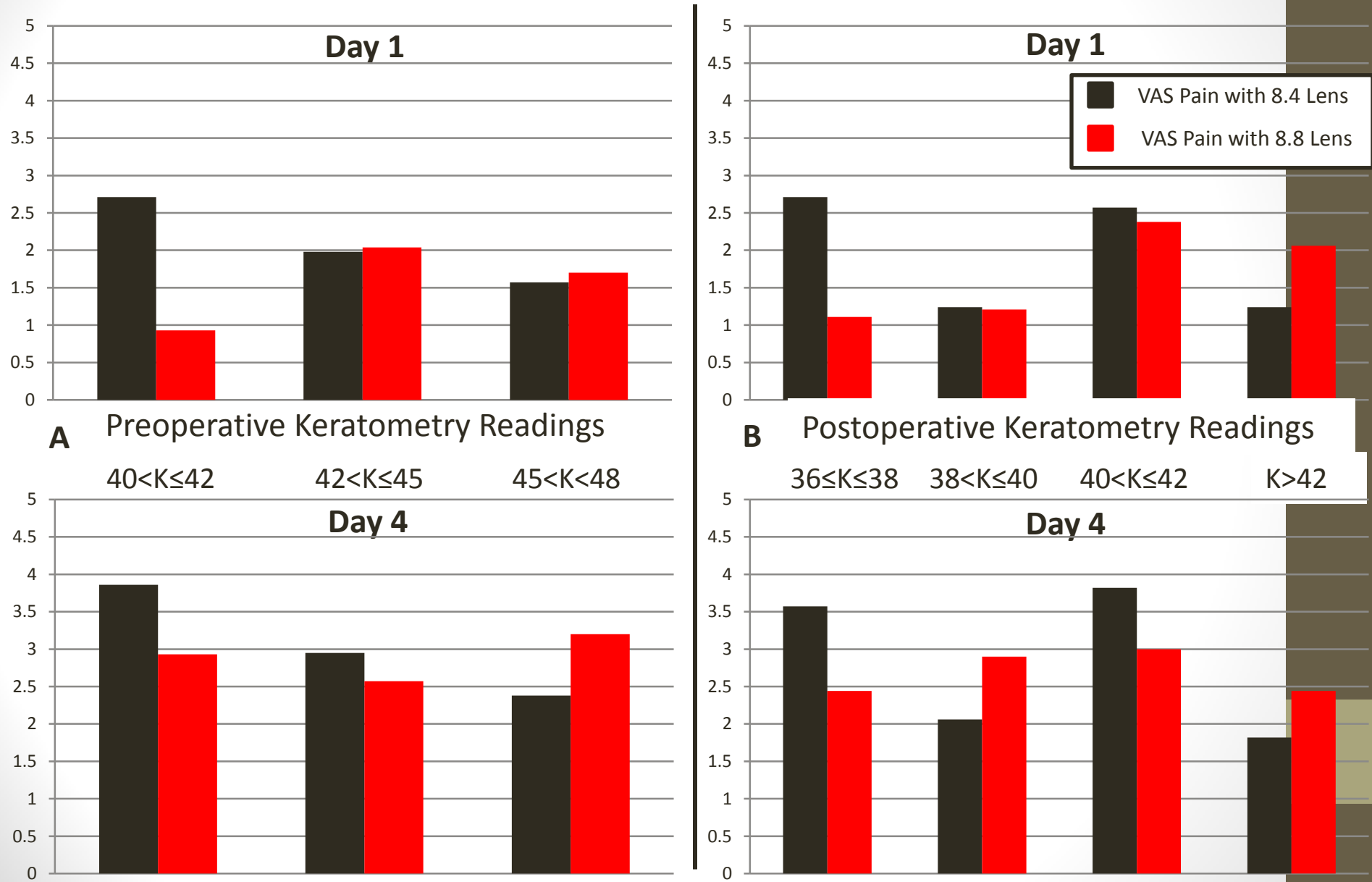


Figure 3: VISX Laser: Pain Scores by Preoperative (A) and Postoperative (B) Keratometry Readings for 8.4 vs 8.8 mm BC Acuvue Oasys lens



Results

- Patients' corneal curvature was the differentiating factor for which lens was most appropriate
 - Steeper corneas (high K) → Tighter BC (8.4)
 - Flatter corneas (low K) → Looser BC (8.8)
- Laser type determined comfort too!
 - Allegretto[®] → Tighter BC (8.4) regardless of K
 - VISX[™] → BC depends on K value
- Five eyes lost their BSCL.
 - Four of the eyes were wearing 8.8 mm BC and had very steep preoperative Ks (≥ 45).

Conclusion

- When using Acuvue Oasys as a BSCL after PRK
 - Steeper Ks are more comfortable with 8.4mm
 - Flatter Ks are more comfortable with 8.8mm
 - Patients treated on the Allegretto should always receive an 8.4 mm lens, likely because they have more prolate corneas postoperatively.
- Fitting a BSCL to corneal curvature also decreases lens loss
- Further studies needed to clarify if fitting lenses according to corneal curvature is appropriate for other brands of BSCLs.