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The Effect of Two Weeks and Twenty-Four Hours Soft Contact Lens Cessation Times on Corneal Refractive Surgery Outcomes

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INTRODUCTION

Soft contact lens (SCL) wear can reduce accuracy of pre-operative corneal measurements and outcomes of corneal refractive surgery (CRS)1-3. Hypoxia induced by overnight removal of SCLs can result in reduced corneal metabolism4,5 and alterations to endothelial structure resulting in increased light scatter and less light transmission6,7. This may affect corneal healing following CRS. The time required for resolution of SCL-induced corneal changes can vary and can be longer than 2 weeks11,12. Despite this, prior to CRS, a standard SCL cessation time is advised for all patients. This cessation time varies according to governing bodies. United States Food and Drug Administration (FDA) guidelines recommend that SCL be left out for at least 2 weeks prior to initial consultation. Whereas, the Royal College of Ophthalmologists in the United Kingdom recommends removing SCL for 1 day before CRS5. Short SCL cessation times prior to CRS may be insufficient for resolution of SCL-induced corneal changes.

HYPOTHESIS

Visual and refractive CRS outcomes would be worse in a SCL group compared to a no-contact lens (NCL) group and worse in a SCL group who ceased SCL wear for 24 hours when compared to those who ceased SCL wear for two weeks prior to examination and treatment.

METHODS

CRS outcomes of dominant eyes for two groups of previous full-time SCL wearing patients were analysed retrospectively; those who ceased SCL wear for two weeks (n = 45) and twenty four hours (n = 49) prior to examination and treatment. In both groups results were compared to a NCL control group (2 weeks SCL group n = 45; 24 hours NCL group n = 49).

LASK and PKR/LASEK outcomes at one, three and six months post-operative visits were assessed for efficacy (unaided distance visual acuity (UDVA) and residual refractive error), predictability (number of eyes within ± 0.250 and ± 0.500 of desired refractive outcome) and safety.

RESULTS

The demographics of the groups tested can be seen in Table 1. There was a trend towards superior CRS outcomes for efficacy, predictability and safety in the two weeks SCL cessation group compared to NCL group. These results were significantly better for LogMAR UDVA in the SCL group and were maintained to the six month post-operative visit (LASK p = 0.03, LASEK/PKR p = 0.03; Table 2).

Table 2: Six month post-operative VA and refraction parameters for the 2 weeks SCL cessation group

| Table 3: Three month post-operative VA and refraction parameters for the 24 hours SCL cessation group

CONCLUSION

Previous SCL wear did not negatively impact on the outcomes of CRS. CRS outcomes with SCL cessation times of 2 weeks and 24 hours did not result in negative outcomes compared to a NCL control group.

While these results were statistically significant, the number of letters difference in UDVA between the SCL and NCL groups was low. Therefore one cannot conclude that these results are clinically significant, as the standard uncertainty value for visual acuity outlined in the International Standards Organisation guidelines is two letters of Snellen VA (0.04 LogMAR), with a 95% confidence level of 4 letters14.

It is likely that the SCL wearers had previously adapted to some under-correction of astigmatism in their SCLs and to the increased surface irregularity with SCL wear15. Therefore previous SCL wearers may have coped with the flatter topography profile following CRS (Figure 1) and post-operative haze4. However, these results are surprising when one considers the effect of the larger image size on VA in the NCL group following CRS. One would expect this would improve VA in this group compared to the SCL group who were accustomed to the larger image size in SCLs, compared to spectacle lenses pre-operatively16.

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Table 1

| Table 4

References


