

Effect of Mini Scleral Lenses on Higher Order Aberration in Irregular Cornea

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Introduction

Irregular astigmatism and higher-order aberrations resulting from severe keratoconus and post Intracorneal ring segments are common causes of reduced quality of vision in most patients. Scleral lenses are considered a vision-saving device when all other treatment modalities fail. The advantage of mini scleral lenses include visual benefits, ability to reduce visual symptoms, increased wearing hours, and improved quality of life.

Purpose

To evaluate whether fitting of mini scleral contact lenses (Rose K2XL, DAVID-THOMAS,UK) can reduce higher-order aberrations in irregular corneas such as keratoconus eyes with and without Intracorneal ring segments.

Methods

A prospective clinical trial was planned which included 29 eyes of 18 patients established cases of keratoconus with or without corneal Intracorneal ring segments (Intacs). Best corrected visual acuity (BCVA), topographic refractive analysis, spherical, and cylindrical refraction were determined prior to contact lens fitting. Total error and higher order aberration was measured by iTrace system (Tracey Technologies Corp., Houston, TX) before and after fitting of mini scleral contact lens. Paired sample t-test and descriptive statistics were used to evaluate the differences in study parameters before and after wearing the mini scleral lens (Rose K2XL, DAVID-THOMAS,UK).

Results

Both the keratoconus groups with and without Intacs, showed significant reduction ($p < 0.01$) in resultant higher-order aberration and total error after fitting mini scleral lenses. There was significant improvement ($p < 0.01$) in best corrected visual acuity after mini -scleral contact lens fitting



Conclusions

The mini-scleral lens was useful in reducing total error and higher-order aberrations in patients with irregular astigmatism such as keratoconus eyes with and without intacs. Mini scleral contact lens is an effective solution for patients with highly irregular cornea..

References

1. Segal O, Barkana Y, Hourvitz D, Behrman S, Kamun Y, Avni I, Zadok D. Scleral contact lenses may help where other modalities fail. Cornea 2003;22:308-10.