POST LENS TEAR TURBIDITY AND VISUAL QUALITY AFTER SCLERAL LENS WEAR

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INTRODUCTION
Scleral contact lenses have lately become an important tool in visual rehabilitation of patients with severe irregular astigmatism or severe ocular surface disorders, as keratoconus. The tear film is the most anterior refractive surface of the eye. Its stability and transparency play an important role in the condition of vision from the optical viewpoint.

During scleral contact lens wear, the transparency of the tear film might be evaluated in its turbidity function, defined as the cloudiness or haziness of a fluid induced by large numbers of individual particles. The use of digital images of the scleral lens over the ocular surface, taken with optical coherence tomography (OCT), combined with an appropriate imagin J editor software could allow to analyzed the transparency of the post-lens tear meniscus, measuring the number of particles density suspended in the tear and the area occupied by the particles.

The purpose of this study was to evaluate the turbidity and thickness of the post-lens tear meniscus and its effect over the visual quality before and after wearing scleral lenses during eight hours in keratoconus patients.

METHODS
26 patients of keratoconus with ages ranging from 25 to 48 (mean 36.95 ± 8.65) were recruited for this study and divided in two groups: with or without implanted ICRS. Fourteen patients were included in the ICRS group and twelve patients were included in keratoconus without ICRS. All patients were fitted with scleral lens with 16.5 mm of diameter in both eyes but measures were only performed in one eye randomly. Corrected Distance Visual acuity (CDVA), contrast sensitivity (CS), pachymetry, post lens tear meniscus height and post lens tear meniscus turbidity (% area occupied and number of particles/mm²) were evaluated with Optical Coherence Tomography (OCT) before and after wearing a scleral lens.

RESULTS
A significant increase of turbidity was found in all groups assessed (p<0.05). The number of particles/mm² was 8 times higher after scleral lens wear than at the beginning of inserting the lens for all groups. CDVA decreases in all groups after scleral lens wear (p<0.001). All patients showed a statistically diminishing of CS after scleral lens wear (p<0.05). A significant correlation were found for both turbidity parameters with CDVA but no correlation between turbidity and post-lens tear meniscus turbidity (% area occupied and number of particles/mm²) was evaluated with Optical Coherence Tomography (OCT) before and after wearing a scleral lens.

CONCLUSIONS
The visual acuity decreases during the scleral lens wearing, filled with preserved saline solution, due to the increasing of post-lens tear meniscus turbidity.

The thickness meniscus tear lens decreases about 70 microns after 8 hours of scleral contact lens wearing, a positive correlation exits between the initial meniscus thickness and the final fall down.

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