

R1 R2 R3 PG0 PG1 Estagiário Tecnólogo
PIBIC Last Name -Bottós First Name -Juliana Middle - Mantovani

Service (sector) Cataract N° CEP 012/06

Corneal and Total Wavefront Analyses in Pseudophakic Eyes implanted with Spherical and Aberration Free Intraocular Lenses

Juliana Mantovani Bottós, Kátia Mantovani Bottós, Karolinne Maia Rocha, Ana Carolina Yamada, Walton Nosé, Paulo Schor **Federal University of São Paulo – UNIFESP/EPM** Optical aberrations of the cornea are known to be balanced by the intraocular structures of the human eye, to produce the whole optical system. The anterior cornea surface creates a positive spherical aberration (SA). Reduction of this SA therefore requires a crystalline or artificial lens that has a negative SA. The impairment of this natural balance by traditional positive-spherical-surface refractive surgery procedure (including crystalline lens exchange) leads to a significant decrease in retinal image quality and might therefore account for visual symptoms. Negative SA or aspherical intraocular lenses (IOLs) aim to induce less SA than traditional (positive SA) IOLs, keeping up the natural corneal SA value that seems to improve some visual function. **PURPOSE:** To compare corneal and total wavefront aberrations measurements using the Pentacam system and the LADARWave aberrometer respectively in 40 eyes implanted with a spherical IOL and an aberration free IOL. **METHODS:** Randomized, prospective and double-blinded study. Twenty patients were randomized to receive two different IOL types: 20 eyes received the SoFlex L161SE (Bausch & Lomb, Rochester, N.Y.), a spherical IOL and 20 eyes received SofPort L161AO (Bausch & Lomb, Rochester, N.Y.), an aspheric IOL. Corneal and total wavefront analyses were performed 30 and 90 days postoperatively using Pentacam system (Oculus, Inc., Lynnwood, Wash.) and LADARWave aberrometer (Alcon Laboratories, Fort Worth, Texas, USA), respectively. The wavefront maps were analyzed using 5 mm pupil diameter and up to the sixth order of Zernike coefficients. **RESULTS:** There were no statistically significant differences between SofPort and SoFlex groups regarding corneal SA values (SofPort $0.46 \pm 0.08 \mu\text{m}$; SoFlex $0.48 \pm 0.09 \mu\text{m}$). Comparing total wavefront analysis, the mean root-mean-square (RMS) values for higher-order aberrations (HOA) was statistically significant lower with the SofPort IOL than the SoFlex IOL (SofPort $0.42 \pm 0.21 \mu\text{m}$; SoFlex $2.64 \pm 0.83 \mu\text{m}$; $p < 0.05$). The SofPort also showed less SA than SoFlex IOL (SofPort $0.16 \pm 0.06 \mu\text{m}$; SoFlex $0.23 \pm 0.10 \mu\text{m}$; $p < 0.05$). **CONCLUSION:** There were no significant differences between the groups comparing corneal wavefront aberrations measured with Pentacam system. Otherwise, the SofPort IOL showed significant less spherical aberration than SoFlex IOL regarding total wavefront aberrations performed with LADARWave aberrometer.