

عنوان مقاله:

Investigation of Optical Eye Power Function under Capsule Properties

محل انتشار:

نهمین کنفرانس بین المللی دانش و فناوری مهندسی مکانیک، برق و کامپیوتر ایران (سال: 1402)

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خلاصه مقاله:

The gradual changes of the capsule geometry and material properties with age and its important role in the design of intraocular lens implants were the motivation of extensive researches on describing the capsule biomechanical behavior. The present work aimed to study the lens accommodation response to different capsule thickness and material properties at different ages. A material and geometry parametric study was performed, drawing some guidelines on the choice of lens capsule thickness and biaxial/uniaxial elastic material parameters, and exploring the response sensitivity of the finite element model at different age groups. The ۱۶ and ۴۸-year-old lenses were considered for lens accommodation simulation. The sensitivity of lens accommodation was studied at each age group by considering constant thickness (cnst-t) and variable thickness (var-t) capsules, and biaxial (Biax) and uniaxial (Uniax) material characteristics tests. The lens was stretched through zonules, and corresponding absolute changes in central optical power (COP) were measured. The ۱۶-year lens model was more sensitive to material properties than thickness variation, while thickness variation was more relevant to  $\Delta$ COP of the ۴۸-year lens model. The ۴۸-year model had the least sensitivity to capsule thickness and material property variations.

کلمات کلیدی:

Human lens capsule, Accommodation, Strain, Finite Element Analysis

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