THE ROLE OF ANTERIOR SEGMENT OPTICAL COHERENCE TOMOGRAPHY IN THE DIAGNOSIS OF SECONDARY CORNEAL ECTASIA AFTER KERATOREFRACTIVE SURGERY

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Background. Secondary corneal ectasia is a rare but serious complication of keratorefractive surgery, characterized by progressive corneal thinning and deformation, resulting in impaired visual function. Early diagnosis is crucial for timely treatment and prevention of disease progression. Anterior segment optical coherence tomography (AS-OCT) enables noninvasive assessment of corneal morphological changes and facilitates the detection of pathological alterations at an early stage.

Purpose. To evaluate the diagnostic value of anterior segment optical coherence tomography parameters in the detection of secondary corneal ectasia after keratorefractive surgery.

Materials and Methods. A total of 120 subjects aged 25–56 years were examined, including 60 patients with secondary corneal ectasia (study group) and 60 healthy individuals (control group). All participants underwent a comprehensive ophthalmic examination, including anterior segment optical coherence tomography. The analyzed parameters included central corneal thickness, minimum corneal thickness, corneal radius of curvature, corneal volume, and sectoral corneal thickness distribution.

Results. Patients with secondary corneal ectasia demonstrated a significant reduction in central corneal thickness (503.6 ± 38.2 μm vs. 534.0 μm in the control group) and minimum corneal thickness (418.0 ± 21.1 μm vs. 460.0 μm). A decrease in the radius of corneal curvature, reflecting increased corneal steepening, was also observed. In addition, sectoral analysis revealed marked asymmetry in corneal thickness distribution and structural heterogeneity of the cornea.

Conclusions. Anterior segment optical coherence tomography is a highly informative method for the diagnosis of secondary corneal ectasia following keratorefractive surgery. The most significant diagnostic indicators include reduced central and minimum corneal thickness, altered corneal curvature, and pronounced irregularity in sectoral corneal thickness distribution. AS-OCT is an effective tool for the early detection of pathological corneal changes and for the longitudinal monitoring of corneal status after keratorefractive surgery.

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