Abstract:

Aim: This study aimed to examine the effect of trabeculectomy with mitomycin C surgery, the most common glaucoma surgery, on corneal biomechanical characteristics on the basis of its two common types, PEXG and POAG.

Methods: In this prospective comparative case series study, 32 glaucoma patients of whom 17 patients were suffering from PEXG and 15 patients from POAG were enrolled. All patients underwent complete ocular examination, CCT using ultrasound pachymetry and corneal biomechanical study using ORA. The patients were hospitalized and trabeculectomy surgery with mitomycin was done. Three months after surgery, patients were examined and ORA was taken again. Excluded criteria included a history of contact lens and any ocular surgery, systemic disease, such as connective tissue disease and diabetes, corneal disorders such as corneal ectasia, and Oscar dystrophies and scar, central corneal thickness less than 500 and more than 580 microns, an IOP after surgery of less than 5 and no more than 21 and any surgical complications.

Results: The mean CH in patients with PEXG was lower compared to patients with POAG (5.66 ± 1.13, 7.49 ± 0.88, respectively) before surgery, which had a statistically significant difference (P <0.001). CRF in patients with PEXG was significantly lower compared to patients with POAG (8.19 ± 1.48 vs. 9.35 ± 1.60, respectively) before surgery, with P = 0.049.

CH remarkably increased and reached 6.69 ± 0.78 (P <0.001) in the PEXG group after TBX + MMC surgery. CH increased in the POAG group after TBX + MIC surgery and reached 8.23 ± 1.09, which was statistically significant (P = 0.001).

There was a significant relationship between CH and IOPg changes in both PEXG and POAG groups (P <0.001 and P = 0.01, respectively).

Although TBX + MMC surgery changed the amount of CH in PEXG and POAG groups, no significant difference was shown in the parameters between the two groups comparing the CH changes.(p= 0.33)

Conclusion: This study showed that the biomechanical characteristics of the cornea, particularly CH, had certain changes after surgery and it increased, reflecting the dynamic nature of these parameters. Our knowledge on biomechanical changes after glaucoma surgery can help us better understand the pathophysiology of glaucoma diseases and make the right decisions to follow-up with the patients.

Key words: corneal biomechanical properties, Trabeculectomy, primary open angel glaucoma, pseudoexfoliative glaucoma