evaluated before and after surgery. Roughness of bared DM was measured by atomic force microscopy (AFM) comparative to the roughness of the cut, made by mechanical microkeratome (Moria II).

Results: At 12 months observation after penetrating keratoplasty UCVA was 0.37±0.18 and 0.21±0.12 (p=0.023), BSCVA was 0.81±0.15 and 0.47±0.17 (p=0.01) in main and control group, respectively. Postoperative astigmatism was equal to 3.25 ± 1.2^{D} in main group and was higher in the control one – 4.5 ± 1.3^{D} (p=0.024). EC loss was equal in two groups – 18.9% (main) and 21.4% (control, p>0.05). After the lamellar procedure at 6 months observation UCVA was 0.21±0.17 and 0.12±0.13 (p=0.031), BSCVA was 0.54±0.15, and 0.42±0.14 (p=0.023) in main and control group, respectively. At 12 months UCVA was 0.29±0.19 and 0.26±0.2 (p>0.05), BSCVA was 0.66±0.15 and 0.54±0.18 (p>0.05), respectively. Part of patients, achieved BSCVA≥0.5 was 97.1% in the main group and 71.4% in the control one (p=0.013). Postoperative astigmatism was equal to 3.7±1.4 D in the main group and was higher (p=0.04) in the control one (4.8±1.9 D). EC loss (7.4 and 6.1%, p>0.05), central graft thickness (506±20 and 521±28 um, p>0.05) and residual recipient's tissue thickness (25±4 and 25±5 um, p>0.05) were comparable. CH and CRF had improved from 6.6±1 and 4.8±1.1 mm Hg to 9.9±0.7 and 9.3±0.8 mm Hg (p<0.001) in the main group. AFM showed roughness mean square (RMS) of DM=92±6.3 nm, comparable to RMS of microkeratome-assisted cut of 120±19 nm (p>0.05).

Conclusions: Introducing femtosecond laser techniques resulted in faster visual recovery, lesser postoperative astigmatism and lager part of patients, achieved BSCVA≥0.5, comparative to traditional methods.

Key words: keratoconus, femtosecond laser, penetrating keratoplasty, deep anterior lamellar keratoplasty, big-bubble technique, atomic-force microscopy.

CROSSLINKING UV™ – X EPI-ON

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Keratoconus is a bilateral noninflammatory conelike ectasia of the cornea. Corneal Collagen Cross linking with riboflavin (UV^{TM}–X) strengthens the intrinsic biomechanical property of the cornea using ultraviolet A (UVA) and riboflavin 0.1%.

Aim: To evaluate the clinical usefulness of crosslinking – UV^{TM} for stopping the progression of keratoconus.

Method: Clinical prospective study, that included 82 eyes with moderate or advanced progressive keratoconus (K: 48 – 72 D). Two techniques of treatment were performed: in 42 eyes - UV^{TM}-X epi-off and in 40 eyes - UV^{TM}-X epi-on. The first is accomplished with central corneal abrasion, riboflavin drops and exposure to UVA (365 nm, 3 mW/cm2) at 5 cm distance for 30 minutes. UV^{TM}–X epi-on is performed without desepitalization of the cornea with balanced solution of riboflavin instilled for 20 minutes and UVA exposure (365 nm, 9mW/cm2) for 10 minutes. Postoperative examinations were carried over the course of 1 day, 1 week, 1, 3 and 6 months, including visual acuity, biomicroscopy, corneal topography, pachymetry, refractometry, keratometry.

Result: In all treated eyes, the progression of keratoconus was stopped. In 42 eyes (51,2 %) visual acuity was improved. The priority of UV^{TM}–X epi-on tehnique results in absence of pain syndrome and fast postoperative recovery.

Conclusion: Crosslinking – UV™-X is a way for stopping the progression of keratoconus.