CORNEA AND EXTERNAL EYE

MEDIUM TERM RESULTS OF PENETRATING KERATOPLASTY

Dorin Chiselita, Anisia-Iuliana Alexa, Teodor Stefanache, Madalina-Adriana Chihaia
Iasi, Romania

Purpose: This is a retrospective evaluation of penetrating keratoplasty for optical purpose in the Eye Clinic of the Clinical Emergency Hospital "St. Spiridon "Iasi.
Methods: The study evaluated 51 eyes of 50 patients, mean age of patients was 50.8 years. Indications for penetrating keratoplasty were: stage IV keratoconus (31.3%), chronic corneal edema (29.4%), corneal dystrophies (17.6%), corneal leukoma (17.6%) and irreversible graft rejection (3.9%). Penetrating keratoplasties were performed by the same surgeon. Postoperatively, patients were evaluated regularly through a comprehensive eye exam. Mean follow-up was 22.7 months post-keratoplasty (SD ± 20.8)
Results: During follow-up 73% did not show any postoperative complication, while 17% of cases showed an increased intraocular pressure; 10% developed acute graft rejection. Survival without acute rejection of the transplant is 95% at one year and 93% at two years. Aphakic or pseudophakic cases have higher risk of developing high intraocular pressure compared to phakic eye (41% vs 3%). Among patients where the keratoplasty was performed on phakic eye (28), only one developed secondary cataract. Glaucoma before the intervention is a risk factor for increased intraocular pressure unlike patients without glaucoma. Also, performing penetrating keratoplasty combined with another procedure in the same operation increases the risk of ocular hypertension in 32% versus 18% for keratoplasty alone. Secondary astigmatism 3 months or more after keratoplasty recorded values between -3.5 and + 5 D. 30 patients(63.8%) had a final visual acuity between 0.3-0.9 Snellen line. 27.4% of patients had a better visual acuity compared to fellow eye.
Conclusion: Penetrating keratoplasty results are influenced by preoperative status, type of surgery and also by rigorous long-term follow-up of patients to prevent and address complications as soon as possible.

FEMTOSECOND LASER ASSISTED KERATOPLASTY FOR KERATOCONUS

Prof. Pashtaev N. P. , Pashtaev A.N.
The S. Fyodorov Eye Microsurgery Federal State Institution, Cheboksary Branch, Russia
Head of Department of Ophthalmology and Otolaryngology, Chuvash State University, Russia

Purpose: To evaluate the results of treatment of keratoconus of different stages by femtosecond laser assisted procedure.
Methods: Femtosecond laser (AMO Intralase 60kHz) assisted penetrating keratoplasty (FS-PKP) with “combined” trephination profile was performed for 115 eyes (main group), and traditional penetrating keratoplasty - for 112 eyes (control group) with stage 4 keratoconus. The 2 groups were compared in terms of UCVA, BSCVA, postoperative astigmatism and endothelial cell (EC) loss. An original technique of femtosecond laser-assisted deep anterior lamellar keratoplasty (FS-DALK) with optimized cutting algorithm allowing to result “mushroom-shape” transplant and recipient’s bed edge and avoid using sharp instruments for making big-bubble, was performed for 34 eyes (main group), and manual deep anterior lamellar keratoplasty (DALK) – for 35 eyes (control group) with stages 2 and 3 of keratoconus. The 2 groups were compared in terms of UCVA, BSCVA, postoperative astigmatism, EC loss, central graft thickness and residual recipient’s tissue thickness. Also, corneal hysteresis (CH) and corneal resistance factor (CFR) were

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

Bilba Rodica, Chiriac Vera, Toncoglaz Cristina, Tumuruc Irina, Coșulă Cristina
Medical Centre "Oculus prim", Chisinau

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.