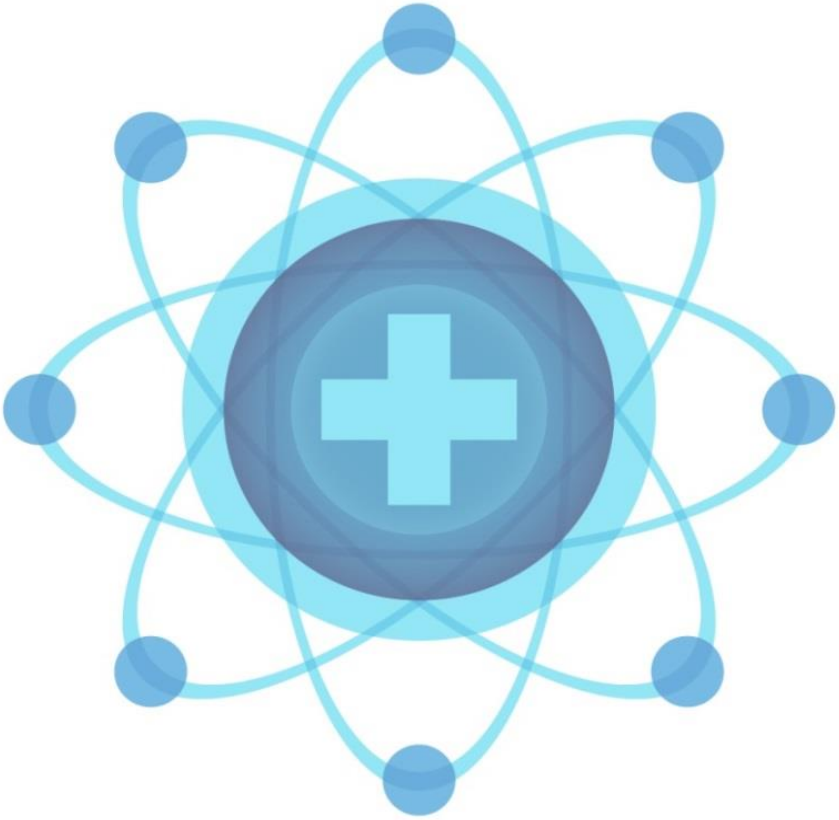

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CLINICAL EXPERIENCE IN THE USE OF STREAMLIGHT NON-CONTACT LASER VISION CORRECTION TECHNOLOGY IN THE SURGICAL TREATMENT OF MYOPIA AND MYOPIC ASTIGMATISM

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Abstract: The results of non-contact vision correction using the transepithelial PRK (Streamlight) method were studied in comparison with traditional technology. 40 patients (80 eyes) with myopia and myopic astigmatism were operated on. Patients were divided into 2 groups. The healing of the epithelial defect was significantly faster in the Streamlight group. NCVA after 5, 7 days, and 8 weeks in the Streamlight group were significantly better.
Keywords: myopia, myopic astigmatism, STREAMLIGHT, PRK, vision correction, non contact correction.

Introduction. In the structure of excimer laser surgery, a large proportion of all interventions are for the correction of myopia. It is known that the choice of excimer laser correction method for myopia and astigmatism in combination with a thin cornea is difficult due to the poor predictability of the results, the above requires the development of such methods for correcting refractive errors that would combine maximum safety and high postoperative result [3,4,6].The technique of transepithelial photorefractive keratectomy (Streamlight), being applicable in the world excimer laser practice, has established itself as an operation that combines all the advantages of PRK (simple technique, minimal risk of intra- and postoperative complications associated with the formation of a corneal valve, the possibility of performing with a thin cornea without the risk of keratectasia).The advent of the single-stage transepithelial photorefractive keratectomy (transepiPRK) procedure in clinical practice has sparked a real resurgence of interest among refractive surgeons[1,5,7,11]. Previously, traditional technique (PRK) was used for superficial ablation in mild or moderate myopia and astigmatism, which has established itself as a fairly safe and effective method of laser vision correction (Manasvee S. et al., 2000). This method can be used even in those patients for who, flap methods as Lasik and Femtolasikare contraindicated, for example, due to thin corneas Today, with the

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standard technique, the epithelium is removed manually with 20% alcohol and a scraper; however, the rate of wound healing during an operation using this technique is not much different from other existing techniques [10].During the StreamLight™ procedure, the epithelium is removed using an excimer laser.Many refractive surgeons, including ourselves, believe that transepiPRK or PRK are the preferred methods for all myopic patients with a cornea thickness of less than 480 μm[2,9].
Contraindications for superficial ablation, as well as for femtolaser vision correction, are cataracts, glaucoma, severe dry eyes,uveitis, collagen autoimmune diseases. Many authors do not recommend these techniques in patients with hypermetropia, patients with high myopic spherical equivalent and astigmatism greater than 3D [8].
Materials and methods. The clinical material was collected on the basis of the Department of Ophthalmology of the Innovative Clinic of Dr. Maksudova (DMC), Tashkent, Uzbekistan. We examined and operated on 40 patients (80 eyes) with myopia and myopic astigmatism. There were 23 male patients and 17 female patients. The age of the patients ranged from 22 to 28 years, the average age was 25.1±2.0 years. Patients were divided into 2 groups. In the first group, patients underwent surgery using Streamlight™ technology, in the second group, using traditional PRK technology. All patients underwent laser vision correction using a Wavelight EX 500 excimer laser device (Alcon lab., USA). Indications for surgery were myopia and astigmatism in all cases, as well as corneal thickness less than 480 μm. Both groups underwent a standard procedure before surgery.
In the StreamLight group, the conjunctiva and corneal interface were pre-cooled with ice-cold BSS during 30 seconds. After removing excess fluid from the conjunctiva and cornea with a dry spear-shaped sponge, deepithelialization of the cornea was performed in the StreamLight PTK mode for 25–35 seconds, depending on the degree of refraction. StreamLight™ has the option to individually determine the depth of epithelial ablation in the range from 45 to 65 μm after epithelial mapping. After a 7-10-second break to cool the cornea, laser ablation of the corneal stroma was performed, followed by cooling the cornea for one minute with ice-cold BSS from a syringe. In the traditional PRK method, the corneal epithelium was removed manually using an alcohol solution and an instrument.
After completion of operations, eye drops of tobramycin and corticosteroids without preservatives were instilled, a soft bandage contact lens (Acuvue®Moist) was applied to the cornea. The bandage contact lens was removed 5 days after surgery in both groups. Patients were advised to continue instilling three times a day corticosteroids without preservatives for 6 weeks, as well as drops of beta-blocker timolol after 2 weeks, 2 drops per day for a month, to reduce transiently rising IOP after instillation of corticosteroids. Also, patients were recommended instillations of tear-replacing drugs without preservatives based on hyaluronic acid.
The optical zone of laser ablation was 6.0-6.5 mm. Prior to laser vision correction, patients underwent the following methods of examination of the organ of vision: visometry, keratotopography WaveLight Oculyzer II (Alcon, USA), A-scan Tomey "OA-2000" (Tomey, Japan), optical coherence tomography of the cornea DRI OCT triton (Topcon , Korea), B-scan, examination of fundus.

Results and discussion.

Preoperative data shown in Table 1. There was no significantly statistically difference between our two groups ($p > 0.05$).

	Streamlight n=40 eyes	Tradition PRK n=40 eyes
Age	24.7±0.9	25.1±0.8
Axial (MM)	25.1±0.8	25.4±0.7
Sph.eq (D)	4.78±1.1	4.25±1.2
Cyl.com (D)	2.1±0.9	1.89±0.8
K1 (D)	42.8±1.1	42.6±1.2
K2 (D)	45.5±1.4	44.8±1.2
UCVA	0.08±0.01	0.08±0.01
MCVA	0.9±0.1	0.89±0.1
Pachymetry (MKM)	476.1±2.3	475.8±1.8

Table 1. Preoperative data.

In the Fig.1 shown that the epithelial wound healing was achieved faster in the Streamlight group. We admitted that the wound completely closed in 52.1±3.5 hours in Streamlight group, and in 65.2±2.7 hours in traditional PRK group ($p < 0.0001$).
In the Table 2 shown postoperative results after 2 types of surgery. We have checked NCVA at 5 and 10 days and vision acuity was significantly better in Streamlight group ($p < 0.001$), after 8 weeks both groups had comparable NCVA ($p > 0.05$).

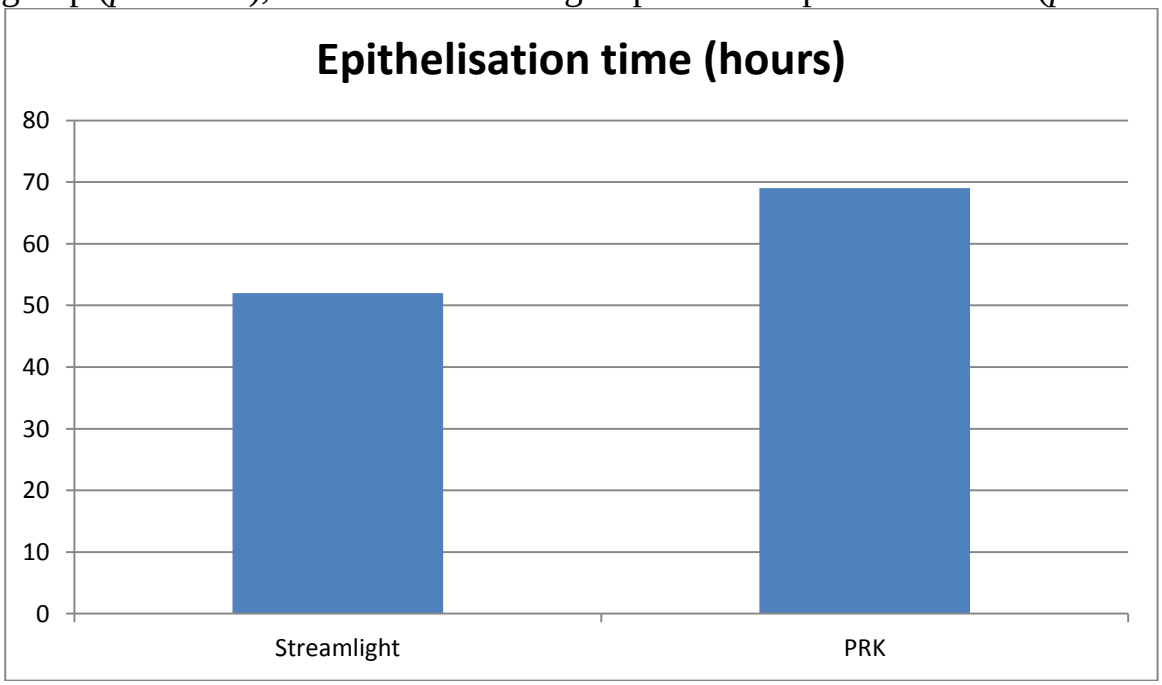

Fig1. Time of full epithelisation of the cornea after surgery

	Streamlight n=40	**PRK n=40**
5 days	**0.67±0.08**	**0.58±0.07**
10 days	**0.86±0.11**	**0.67±0.12**

8 weeks	**0.98±0.10**	**0.91±0.11**

Table 2. Postoperative NCVA

	Streamlight		**PRK**	
	Sphere	**Cylinder**	**Sphere**	**Cylinder**
5 days	**0.49±0.09**	**0.26±0.08**	**0.55±0.07**	**0.26±0.08**
10 days	**0.46±0.11**	**0.25±0.07**	**0.47±0.12**	**0.26±0.06**
8 weeks	**0.15±0.10**	**0.24±0.07**	**0.21±0.09**	**0.25±0.05**

Table 3. Postoperative refraction

In our examination during 8 weeks no patient had a postoperative complications, haze or regress of refraction in both groups.

Conclusion.

The result of our study showed that both methods, Streamlight and traditional PRK, are safe and effective in correcting ametropias, in particular myopia and myopic astigmatism. But it should be taken into account that with the one-stage streamlight procedure, the healing of the epithelium occurred faster, the pain syndrome was also less pronounced, and the NCVA was higher than with PRK.

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