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Clinical Course Followed Up in Contact Lens Applications of Traumatic Aphakia Contact Lens Applications of Traumatic Aphakia

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Abstract

Aim: To compare the clinical results of vision rehabilitation performed with contact lens in aphakic patients who underwent surgery due to ocular trauma.

Methods: A total of 29 eyes of 29 patients who developed aphakia following ocular trauma and used contact lenses for aphakia, followed up from September 2003 to February 2015 were included examined. Their age, gender, best visual acuity with contact lenses (BVACL), the kind of contact lenses they used, their reasons for stopping the use of contact lenses or changing them and the complications related to contact lenses were recorded.

Results: Out of the 29 patients, 8 were women and 21 men. Their average age was 36.5 ± 15.8 (12 to 61) years. Out of the 21 subjects who used hydrogel contact lens (Net Lens), 3 of them were applied cosmetic soft contact lens (Net lens 55 proesthetic) due to aniridia, rigid gas permeable contact lens (RGPCL) were applied to 5 of the patients, hydrogel lens (Weicon CE) with 60% water content to 2 of the patients and Elastofilcon A (Silsoft) to one. According to the Snellen eye chart BVACL was 0.5 and above in 8 of the patients (27.6%), between 0.2 to 0.4 in 18 of the patients (62%) and below 0.1 in 3 of the patients (10.4%). Eight of the subjects (27.6%) stopped using contact lenses during their follow-up.

Conclusion: Good quality and dependable eye sight rehabilitation is obtained by the use of contact lenses in aphakia connected to trauma.

Keywords: Contact lens; Traumatic aphakia; Vision rehabilitation

Introduction

Damage may occur in the texture of cornea, lens, vitreous and retina due to penetrant or blunt eye traumas. Patients with penetrating injury occasionally have extensively irregular corneal lacerations, severe iris injury or loss, and concurrent traumatic cataract. In many of the patients, after primary repair and lensectomy, it is impossible to insert the intraocular lens (IOL) in the remnants of the capsular bag if any remnant exists. Occasionally, in traumatic aniridia, iris fixation is even impossible, and scleral fixation remains the only surgical option in these cases; however, visual acuity remains poor because of the concomitant irregular astigmatism that would not be eliminated by IOL implantation [1]. In traumatic aphakia, as a result of the trauma suffered by the patient, the patient loses his phakic lens and no anatomic structure is available in the damaged eye to attach the intraocular lens (IOL). In such cases: eyeglasses, contact lens, or surgical suturation and intraocular lens (IOL) implantation can be counted among the visual rehabilitation choices. Appearance of anisometropia, especially due to the one sided nature of most traumatic events, renders the use of eyeglasses impossible. Almost 2% enlargement of the objects appears for 1 dioptric correction in aphakia eyeglasses. This situation constitutes almost 25% enlargement in the images during aphakia correction. In addition, quality vision is not obtained with these glasses because they cause range narrowing (circular scotomization) at the rate of 25%, skipping of image i.e. sudden appearance of images entering the circumference of vision from the side [2]. Because the magnification level in contact lenses is negligible, they are preferred over eyeglasses for binocular vision. Another superiority of the contact lens is its providing rehabilitation of irregular astigmatism which occurs due to trauma [3,4]. Aphakic contact lenses with cosmetic properties in different colors can be used to avoid light sensitivity in cases where aniridi exists along-side with aphakia; thus making use of both functional and cosmetic effects.

Materials and Methods

Twenty nine eyes of 29 patients, 8 of them women 21 men, who have applied to Cornea Unit of the Ankara Ulucanlar Research and Training Hospital of the Eye, from September 2003 through February 2015 due to traumatic aphakia but had their surgeries performed in our hospital or in other centers at the early stages and also those patients who wished to use contact lenses were included in this study. In addition, aniridia is also present in three of these patients. The study protocol was approved by the Ethics Review Committee of Ministry of Health Numune Research and Education Hospital, carried out in accordance with the principles of the Declaration of Helsinki.

Prior to attempting the contact lens trial, full ophthalmologic examinations were performed including their best corrected visual acuity with glasses by snellen chart, non-contact tonometry, bio-

microscopic examination and detailed fundus examination in these patients.

Lenses were selected according to the patients' keratometric values and the patients' adaptability. Because of irregular astigmatism and scar, rigid gas permeable contact lens (RGPCL) was applied at the beginning of the trial period on all patients however only 5 of the subjects could tolerate this procedure. Gas permeable hard contact lenses with aspheric design Aquilla with Dk: 143 were applied to these patients. In the remaining 24 patients soft aphakic contact lenses made of hydrogel were implemented, because its adaptation and adjustment is easy and also in order to avoid disfotopsy findings like halo, glare related to pupil irregularity with RGPCL.

The average duration of lens use was 25-34 months (6-96 months). There was no decrease in visual acuity during the patients' use of lenses in their follow-up.

Results

Contact lenses were applied in the cornea unit for aphakia rehabilitation to patients who had perforation due to trauma and cataract surgery at our clinic or in other centers. Out of the 29 patients applicable, 8 were women and 21 men. Their average age is 36.14 (12-61) years.

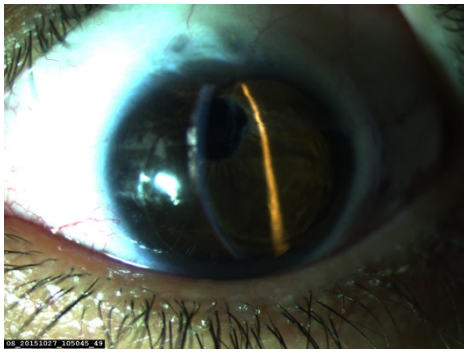

Figure 1: Hydrogel contact lens applying on cornea.

Eighteen of the subjects were using hydrogel contact lens containing 38% water (Net Lens) (Figures 1 and 2). Net Lens 55 Prosthetic soft contact lenses were applied to 3 of the patients due to aniridi (Figures 3 and 4). Aquilla (Acuoficon-fluorosilicone acrylate) rigid gas permeable contact lenses with Dk: 143 made of asferic properties were applied to 5 of the patients and Weicon CE hydrogen lens with 60% water content to 2 of the patients and Silsoft (Elastofilcon A) to one subject (Table 1).

Type of lens	Number of patients	Lens material	Water content	DK
NETLENS	18	P-HEMA	38%	
NETLENS 55 proesthetic	3	MMA-N-VINIL	55%	
WEICON-Alcon	2	MMA-VP	60%	28
AQUILLA-Ciba Vision	5	FLUROSILICON AKRILAT		143
SILSOFT-Bausch & Lomb	1	ELASTOFILCON A	0.2%	340

Table 1: Types of Lenses.

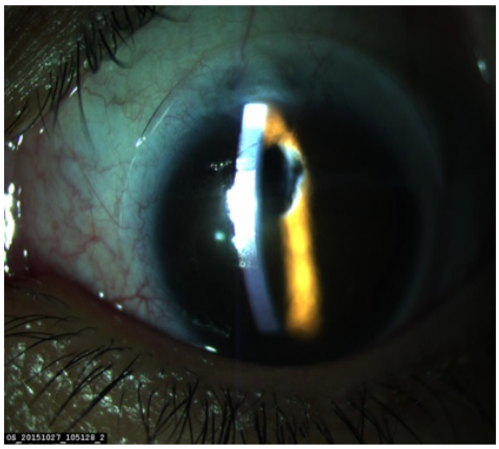

Figure 2: Hydrogel contact lens applying on cornea.

Figure 3: Transillumination of cosmetic aphakic hydrogel contact lens.

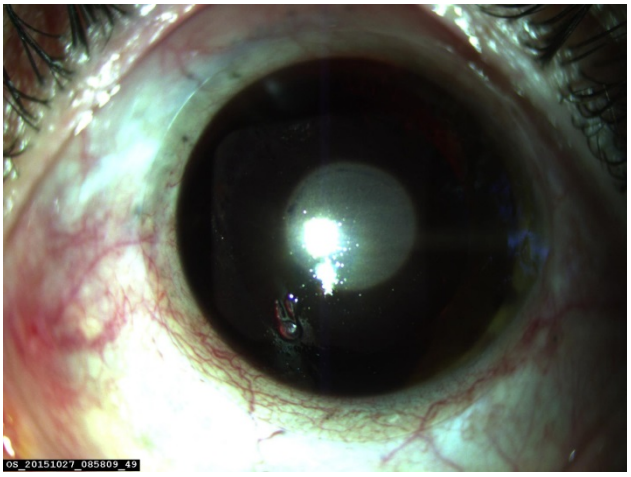

Figure 4: Cosmetic hydrogel contact lens on cornea.

The best corrected vision acuity with contact lenses (BCVACL) according to the Snellen chart was seen to be 0.5 and above in 8 of the patients (27%), at 0.2 -0.4 in 18 patients (62%) and below 0.1 in 3 of the patients (10.4%) (Figure 5).

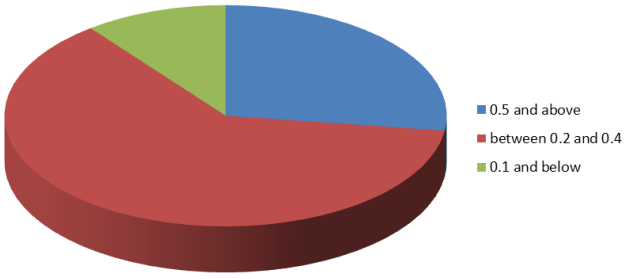

Figure 5: Vision acuity ratios.

Out of the 38 patients who were included in this study, 8 of them stopped using contact lenses in early period. Out of those patients 4 were using hydrogel soft contact lens with 60% and 38% water content and they could not adjust to using their contact lenses. Among them, the 7 year old junior patient who was using Weicon hydrojel soft lens with 60% water content and with patching after 4th years of follow-up stopped using contact lens because there was no improvement in the sharpness of his vision. The reason of discontinuation in another patient was advancement of deep stromal corneal vascularization, yet in another patient was following retina detachment surgery which came about in the 4th year of follow-up and in the last patient a surgery was performed upon his acceptance regarding the settlement of intraocular lens with scleral fixation.

During the follow-up, no complications were developed outside of dry eye symptoms like burning, stinging and dryness. Out of the 29 patients who continued using contact lenses, the occurring symptoms in 7 of them were relieved with preservative free artificial tears and no additional treatment was necessitated.

Discussion

Eyeglasses, various types of contact lenses and surgical choices are available for rehabilitation of traumatic aphakia.

Contact lenses have been considered great optical options for addressing both aphakia and corneal irregularity [5]. Use of contact lens is an effective method in cases when sight rehabilitation by use of eyeglasses becomes impossible due to anisometropia, especially in one sided subjects. Placement of lens inside the eye is an effective means of treatment in cases where capsule support is available. But in cases where capsule support from behind is not possible, it is mandatory to place an intraocular lens (IOL) to the anterior chamber, and an IOL fixation or a IOL implantation attached to the iris to the anterior chamber [6-11]. But in case the eye has been exposed to trauma, damage may be caused in the anterior chamber intraocular lenses foremost at the endothelium, the angle and the iris. Risk of development of secondary glaucoma increases. Fixation to posterior chamber may cause conjunctiva and erosion due to suture in sclera, deviation in the IOL or dislocation of IOL [6-10].

In general, in the correction of refractive errors of traumatic aphakia, rigid gas permeable contact lenses are recommended as effective, reliable and tolerable method [12-14]. Rigid highly gas permeable contact lenses have gained more popularity nowadays, especially in the patients with concomitant high astigmatizm [15,16]. Central corneal opacity is an issue in the RGP use especially at the bearing point on the cornea. Peripheral corneal neovascularization has also been reported [17,18]. In each case, we prefer the type of lens according to the patient's expectations, adaptability, transparency of his cornea and his visionary potential. For example even though they are the first choice rigid gas permeable contact lenses have some disadvantages in terms of adaptation and usage. Great care is needed during the usage of the lens because scratch and crack in the lens affects the sight. The fact that the lens can easily fall out with sudden lid movements, or because noticing its presence is too difficult in cases when it slides to the fornix or to under the lid because it is too small. Also especially when the pupil dilates in dim environments, since the RGPCL's diameter is small, it may cause dysphotopsy occurrences like glare, halo and reflections from the side of the lenses [19].

Some types of soft contact lenses have been used for correction of aphakia. In aphakia due to its high permeability to oxygen and easy handling [20]. Since the group facing trauma is usually among the young patients leading active lives, soft hydrogel contact lenses increase adaptation in Daily life. Also the cosmetic lenses applied in cases of aniridia occurrences accompanying aphakia events reduce symptoms like photopsia, glare and increase sight quality. Also in our study, since they are easily used and more comfortable, the hydrogel lenses have been a good alternative for us to use in patients who cannot tolerate RGPCL's and do not want to use them.

In recent years, scleral family lenses have become favorable because of availability of high Dk material and newer design. These lenses are indicated when all other contact lenses fail to improve the vision, with any inability to get an optimal fit with RGP or RGP intolerance, or any complication of other lens groups [21].

In conclusion, whether they are RGPCL or hydrogel contact lenses, they have provided successful visual rehabilitation in patients with no need for surgery.

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Conflicts of Interest:

Kazancı B, None; Kavuncu S, None; Ozek D, None; Ileri D, None; Yılmazbaş P, None.

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