World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-33, April 2024
ISSN: 2749-3644

CORRECTION OF ANISOMETROPIA BY PHAKIC INTRAOCULAR LENSES IN PATIENTS WITH CONGENITAL MYOPIA

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Article history:
Received: January 24th 2024
Accepted: March 21st 2024

Abstract:

Refractive errors occupy a leading place among the causes of visual disorders in children and adolescents. Congenital ametropia — myopia, hypermetropia and astigmatism play a negative role in the formation of visual functions, often leading to gross forms of refractive amblyopia in children. Congenital myopia belongs to a separate group of refractive errors, which differs from acquired myopia in a number of ways. Goal. Analysis of the results of correction of anisometropia in high-grade congenital myopia in children by implantation of phakic introocular posterior chamber lenses (ICL). Methods. This study was conducted in the eye center of LLC "A.A.Yusupov". Operations were performed on 18 patients, including 10 boys and 8 girls, aged from 14 to 18 years. The observation period is from 1 year to 3 years. The initial spherical refraction was determined in the range from -9.0 to -18.0 D. Results. After surgery, visual acuity in all patients was 0,3 and higher. The spherical component of postoperative refraction averages -0.49 D. The average IOP value after surgery was 17 mm Hg. The loss of endothelial cells did not exceed 1.5% (from 0.5 to 1.5%). Conclusion. Correction of high-grade unilateral myopia in children by implantation of phakic posterior chamber lenses ICL leads to satisfactory results in terms of its effectiveness, predictability, stability and safety.

Keywords: Myopic anisometropia, correction, phakic posterior chamber lenses ICL

RELEVANCE. Congenital myopia is a special form that is formed during fetal development [1,2,11]. There is a transient (transient) myopia, which disappears by the end of 1 year of life of a newborn as a result of maturation of the ciliary muscle, a decrease in the refractive power of the cornea and lens, and deepening of the anterior chamber. However, 42% of children with transient myopia become myopic again by the age of 8-9 [2,3]. In addition, there is a true congenital myopia, which is characterized by a high degree (55-91% of cases), an increase in PZO, changes in the fundus. The frequency of this myopia, according to various data, is 1.4-4.5% among children of 1 year old. The clinical picture of congenital myopia is characterized by significant polymorphism, it can combine refractive disorders, anatomical and functional disorders, organic changes in the optic nerve and membranes of the eye, and various concomitant pathology to varying degrees [5]. The current level of development of refractive surgery has made it possible to apply a number of surgical correction methods in pediatric practice. Traditionally, refractive operations are divided into two main groups: intraocular and keratorefractive methods [4,6]. Intraocular surgical methods for correcting ametropia include implantation of phakic intraocular lenses of negative or positive optical power while preserving the natural lens, as well as extraction of a transparent lens with or without IOL implantation. The advantage of intraocular correction is the absence of restrictions in the amount of corrected ametropia, i.e. the ability to use it for high and ultrahigh degree ametropia, including in combination with astigmatism. The necessary conditions for the implantation of phakic IOLs are the normal hydrodynamics of the intraocular fluid and sufficient depth of the anterior chamber [5,6]. Unsuccessful attempts to implant the first models of

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phakic IOLs, which were anterior chamber, and the resulting postoperative complications (endothelial epithelial corneal dystrophy, glaucoma, cataract, iridocyclitis) constantly stimulated researchers to further develop and improve implants [7,8,9]. The relentless interest in the implantation of phakic IOLs is due to the accuracy and stability of the refractive effect, the preservation of the eye's own accommodative ability. [10,11]. Implantation of posterior chamber phakic IOLs in the correction of high-grade anisometropia in children and adolescents has been reported in a number of publications [12,13,14]. However, the researchers note the need for long-term observation to study the effect of phakic IOL on the child's eye, which is still a foreign body.

The aim of the study was to analyze the results of correction of high-grade myopic anisometropia in children by implantation of phakic posterior chamber lenses ICL.

MATERIALS AND METHODS OF THE STUDY: The results of 18 implantations of phakic posterior chamber ICL lenses in high-grade unilateral myopia in children were analyzed. The indications for the operation were the lack of the possibility of using eyeglass and contact correction. Contraindications to this operation were: optic nerve atrophy, very high degree amblyopia, cataract, glaucoma, incomplete transparency of optical media, inflammatory diseases, progressive myopia, anterior chamber depth less than 3.0mm, endothelial cell density less than 2300. This study was conducted at the eye center of A.A.Yusupov LLC. Operations were performed on 18 patients, 10 of them boys and 8 girls, the age ranged from 14 to 18 years. The follow-up period is from 1 year to 3 years. The initial spherical refraction ranged from -9.0 to -18.0 D (average -13.5 D), astigmatism ranged from 0.5 to 2.5 D. Visual acuity with maximum correction before surgery ranged from 0.08 to 0.2. Keratometry values ranged from 42.1 to 45.6. The average eye length was 26.9. All patients underwent ultrasound biomicroscopy before and after surgery. If necessary, peripheral prophylactic retinal laser coagulation was performed for dystrophic changes of varying severity. All operations for implantation of phakic posterior chamber ICL lenses were performed by one surgeon under general anesthesia. The operation was performed through a corneal incision. Additionally, paracentesis was performed at 10 and 2 o'clock. A phakic posterior chamber lens ICL was implanted using an injector according to the manufacturer's instructions.

RESULTS AND DISCUSSION: All operations were performed without complications. One patient had minor hypotension in the first 3 days after surgery. The remaining patients had an active course of the postoperative period. Significant improvement in visual acuity without correction occurred on the first day after surgery. On the first day after implantation of the phakic posterior chamber lens ICL, all patients had visual acuity without correction of 0.3 and higher, on average visual acuity increased by 0.15. The average IOP value after surgery is 18 mmHg. One patient had an increase in IOP, which was stopped by the appointment of beta-blockers. The loss of endothelial cells did not exceed 1.5% (from 0.5 to 1.5%). 6 months after surgery, the severity in all patients was 0.4-0.5 and higher. The spherical component of postoperative refraction averaged -0.49 D (from -0.25 to – 1.5 D). The astigmatic component ranged from 0.5 to 2 D. Keratometric examination did not reveal induced astigmatism in more than 0.75 D. In 84% of cases, postoperative refraction differed from the planned one by no more than 0.5 D. Significant improvement in visual acuity without correction occurred almost immediately after surgery. Postoperative visual acuity not only reached the level of preoperative corrected visual acuity, but also exceeded this limit. The level of maximum visual acuity was observed by the end of the 2nd week after implantation of a phakic IOL. According to the results of ultrasound biomicroscopy, the preoperative depth of the anterior chamber varied from 3.0 to 3.4 mm, and in the postoperative period the distance between the lens and the endothelium averaged 2.3 mm. The distance between the anterior capsule of the lens and the posterior surface of the phakic IOL ranged from 0.5 to 0.7 mm. The lens occupied a central position in the rear camera. 12 months after surgery, the severity in all patients was 0.5 and higher (from 0.5 to 0.8). Refraction remained stable. The average IOP value after surgery was 18 mmHg.

CONCLUSIONS. Correction of high-grade anisometropic myopia in children by implantation of phakic posterior chamber lenses ICL gives satisfactory results in terms of effectiveness, predictability, stability and safety. After surgery, there is an improvement in visual acuity associated with an increase in retinal image, which creates conditions for the normal development of the visual analyzer in children.

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