Prevention of posterior capsule opacification using different intraocular lenses (results of one-year clinical study)

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Key words: *cataract surgery, intraocular lens, posterior capsule opacification, secondary cataract, anterior capsulorrhexis.*

Summary. *Aim. To evaluate and to compare the preventive effect of different intraocular lenses from different material with a round or sharp optic edge design on posterior capsule opacification.*

Methods. Our clinical study included 165 patients. Mean follow-up was 12.4±0.9 months, mean patient age was 67.5±7.8 years. Patients in the group 1 (n=46) were implanted acrylic three-piece hydrophobic intraocular lenses, sharp optic edge (AcrySof, MA3OBA, Alcon), in the group 2 (n=38) – acrylic hydrophobic single piece intraocular lenses, sharp optic edge (AcrySof, SA3OAL, Alcon), in the group 3 (n=39) – silicone three-piece intraocular lenses, sharp optic edge (CeeOn 911A, Pharmacia), and in the group 4 (n=42) – polymethyl methacrylate single piece intraocular lenses, round optic edge (Crystal, 5T, Alcon). The posterior capsule opacification was evaluated for the entire optic and in the central 3-mm zone using EPCO 2000 Software.

Results. Posterior capsule opacification values of the entire optic were 0.002±0.001 in the AcrySof MA3OBA group, 0.007±0.002 in the AcrySof SA3OAL group, 0.002±0.001 in the CeeOn 911A group, 0.029±0.008 in the polymethyl methacrylate intraocular lens group 6 months after surgery. The values were 0.011±0.005, 0.025±0.006, 0.014±0.005 and 0.122±0.021, respectively, one year after surgery. The intraocular lenses types with sharp-edge design (acrylic and silicone) showed significantly lower posterior capsule opacification values than round-edge optic design polymethyl methacrylate lenses ($p<0.05$).

Posterior capsule opacification values of the central 3-mm zone were 0.000±0.000 in the AcrySof MA3OBA group, 0.001±0.001 in the AcrySof SA3OAL group, 0.000±0.000 in the CeeOn 911A group, 0.002±0.001 in the polymethyl methacrylate intraocular lens group 6 months after surgery. The values were 0.0001±0.0001, 0.018±0.007, 0.004±0.002 and 0.028±0.009, respectively, one year after surgery.

Posterior capsule opacification values differences between AcrySof MA3OBA and polymethyl methacrylate intraocular lenses' groups and between CeeOn 911A and polymethyl methacrylate intraocular lenses' groups one year after cataract surgery were established ($p<0.05$).

Conclusions. The sharp-edge foldable intraocular lenses types (AcrySof MA3OBA, AcrySof SA3OAL, CeeOn 911A) showed statistically significant difference in posterior capsule opacification values in one-year follow-up time. The effect of these foldable lenses for prevention of posterior capsule opacification is mainly a result of rectangular, sharp-edged optic design, which creates a sharp capsular bend. A role of material of intraocular lenses (hydrophobic acrylate and silicone) in prevention of posterior capsule opacification during one-year follow-up was not established.

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Introduction

Posterior capsule opacification (PCO), or secondary cataract, is the most common long-term complication of modern successful extracapsular cataract surgery techniques and likely the most common cause of non-refractive decreased postoperative vision. PCO is the result of the proliferation, growth and transdifferentiation of residual lens epithelial cells (LECs) in the capsular bag (1).

PCO development is associated with several social, financial and medical problems because of them PCO should be eradicated as soon as possible.

Neodymium: yttrium-aluminum-garnet (Nd: YAG) laser posterior capsulotomy is usually effective in PCO treatment, but for some clinical and financial reasons, it is not an optimal alternative. Laser capsulotomy is the second most expensive surgical procedure in the Medicare system of the United States, second only to the cost of the original cataract surgery procedure (2). Nd: YAG laser capsulotomy procedure is not completely safe procedure without complications. Sometimes it is a dangerous procedure with potential damage to the intraocular lens (IOL), vitreous, retina, and other ocular structures (3). Modern cataract surgery is a refractive procedure. The satisfactory use of multifocal or toric IOLs in relatively young patients will require a low PCO rate. Clear lens extraction for myopic and hyperopic eyes, which many surgeons are now studying intensively, requires avoidance of PCO because of unacceptably increased risk of retinal detachment (4). In pediatric cataract surgery fast development of PCO could cause amblyopia; also such PCO prevention measures as primary posterior capsulotomy, performed during cataract surgery, can lead to severe complications (5).

According to the literature data, the frequency of PCO ranges between 3% and 50% during the first 5 postoperative years (1, 6). The reasons for that variation can be different postoperative follow-up time, patient age, influencing factors of ocular and systemic diseases and use of different evaluation systems.

Recent clinical studies have showed decrease of PCO frequency until 0.9–17% when modern foldable IOLs are used in cataract surgery (7).

Numerous clinical and experimental studies of O. Nishi (8-11), D. Apple (1, 4, 7), Q. Peng (12, 13), G. Auffarfh (14) and others have demonstrated the benefit on PCO prevention of in-the-bag IOL fixation, IOL material and design. But until now it is not clear, if IOL material or its design is more important in PCO prevention.

The aim of this study was to evaluate and to compare the preventive effect of different intraocular lenses from different material with a round or sharp optic edge design on posterior capsule opacification.

Material and methods

The prospective clinical study was carried out in the Clinic of Ophthalmology of Kaunas University of Medicine in 2001–2003 after approval of Kaunas Regional Ethics Committee. Inclusion criterion was the presence of senile cataract in an otherwise normal eye in patients of 50-80 years of age, in which the same surgeon performed cataract phacoemulsification procedure by the same technique and anterior capsule overlapped the IOL optic for 360 degrees. Exclusion criteria were a history of any ocular or systemic disease and complications during or after cataract surgery.

During this clinical study 165 eyes (patients) were analyzed. The mean age of patients during cataract surgery was 67.5±7.8 years. Mean age of 93 participating women was 67.9±7.5 years and of 72 men – 67.0±8.1 years. There was no difference in age among women and men ($p>0.05$). For all patients mean follow-up time was 12.4±0.9 months.

All patients were distributed into four groups according to the IOL type used during cataract surgery. In the group 1 (n=46) acrylic three-piece hydrophobic intraocular lenses, sharp optic edge (AcrySof, MA3OBA, Alcon) were implanted, in the group 2 (n=38) – acrylic hydrophobic single piece intraocular lenses, sharp optic edge (AcrySof, SA3OAL, Alcon), in the group 3 (n=39) – silicone three-piece intraocular lenses, sharp optic edge (CeeOn 911A, Pharmacia), and in the group 4 (n=42) – polymethyl methacrylate (PMMA) single piece intraocular lenses, round optic edge (Crystal, 5T, Alcon).

Mean age at the time of cataract surgery in the first group was 67.6±7.7 years, in the second group – 67.3±7.6 years, in the third group – 66.9±7.9 years and in the fourth group – 68.2±8.1 years ($p>0.05$).

All operations were performed by the same surgeon (V. J.) under topical and intravenous anesthesia. After the pupil had been dilated, a 3.0 mm scleral or corneal tunnel was performed and

the anterior chamber was reformed with viscoelastic material (Provisc, Healon or Celoftal). A continuous curvilinear capsulorrhexis in an anterior capsule of the lens was created by the use of utrata forceps (Katena). After completion of capsulorrhexis, which is supposed to be about 5.0 mm in diameter, careful hydrodissection with balanced salt solution (BSS) followed. Phacoemulsification was performed resorting to "divide and conquer" technique. The complete equatorial cortex was meticulously aspirated with the irrigation / aspiration (I/A) tip. The posterior capsule was polished in case of necessity. The anterior chamber and capsular bag were refilled with viscoelastic material, the corneal incision being enlarged to 3.5 mm for foldable IOL implantation and to 6.0 mm for hard IOL implantation. All IOLs were implanted in the bag and the viscoelastic material was removed with the I/A tip; at the same time lens epithelial cells were polished from the anterior capsule. Scleral tunnel was sutured with one single 10-0 ethilon suture. Corneal tunnel was closed with hydration of corneal stroma with BSS. In cases of the wound leakage one single 10-0 ethilon suture was used.

Postoperative examinations of all patients were performed on the first day, and after six and twelve months. During each examination, after maximum mydriasis (installation sol. tropicamidi 1%, after 5 minutes sol. ciclogyly 1%, and examination after 30 minutes), standardized retroillumination images of the posterior lens capsule were taken using TOPCON SL 8 Z digital slit-lamp. These images were imported into the EPCO 2000 (evaluation of posterior capsule opacification) program for analysis. The posterior capsule opacification was evaluated for the entire optic and in the central 3-mm zone; the boundaries of the posterior capsule and each opaque area of the posterior capsule were drawn on the stored images using the computer mouse so that the fraction of the opaque area could be calculated with EPCO software. The density of the opacification was clinically graded as 0 (none), 1 (minimal), 2 (mild), 3 (moderate), or 4 (severe). Individual PCO score for each image was calculated by multiplying the density of the opacification by the fraction of capsule area involved behind the entire optic and central 3-mm zone (Fig. 1.). The anterior capsule overlapping area on the IOL optic

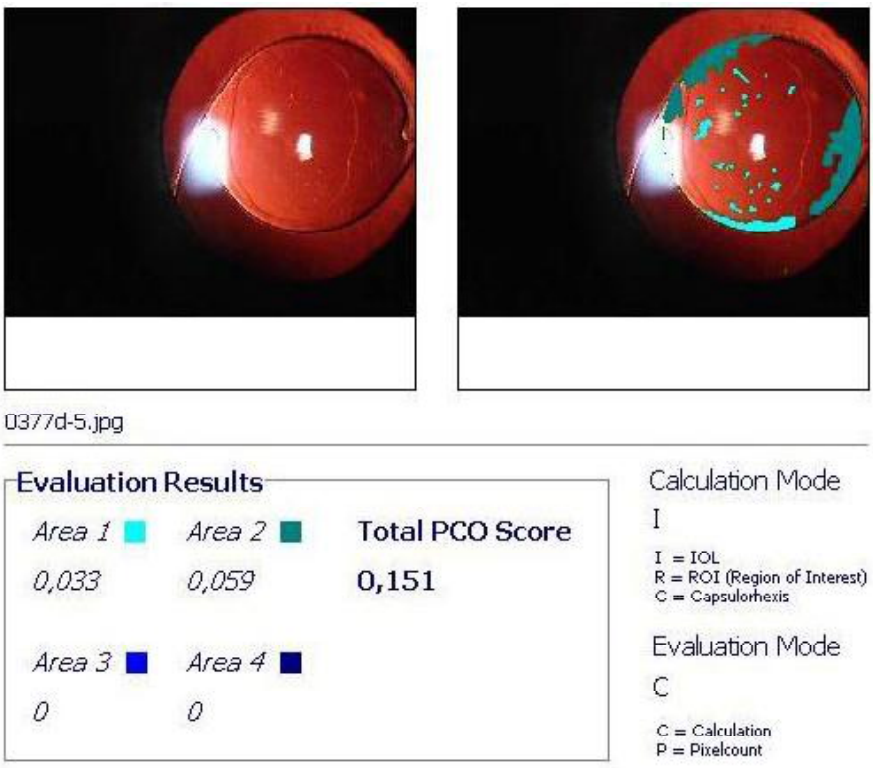

Fig. 1. **Evaluation of posterior capsule opacification value (opacity density x area) in the entire IOL optic area with EPCO 2000 software**

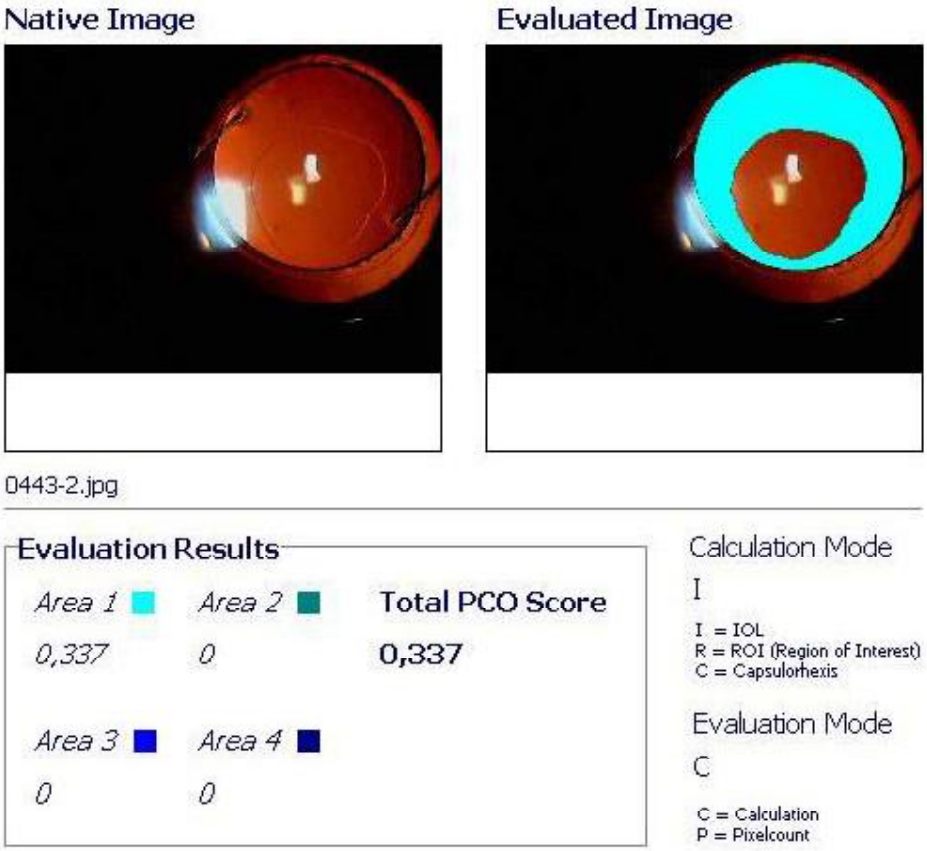

Fig. 2. **Evaluation of anterior capsule overlapping with EPCO 2000 software**

(percentage of optic area) on the IOL optic was calculated with the same system (Fig. 2) (15).

Statistical analysis was performed using the statistical program packages: "Statistica 5.5", "Excel 2000". The differences between independent samples results were analyzed using Mann–Whitney U test. A two-sided p value less than 0.05 was considered statistically significant.

Results

The averages of PCO values of the entire optic area after six and twelve months are presented in Table 1. The intraocular lenses types with sharp-edge design (acrylic and silicone) showed significantly lower PCO values than round-edge optic design PMMA lenses ($p<0.05$).

The average PCO values of the central 3-mm optic zone after six and twelve months are presented in Table 2. Statistically significant differences in PCO values in the central 3-mm optic zone between AcrySof MA3OBA and PMMA intraocular lens groups and between CeeOn 911A and PMMA intraocular lens groups one year after cataract surgery were established ($p<0.05$).

There was no eye that required treatment with Nd: YAG laser capsulotomy during one year after cataract surgery.

The average overlapping of capsulorrhexis and IOL optic on the first day after cataract surgery in the first group (AcrySof, MA3OBA IOL) was 33.7%±11.9%, in the second group (AcrySof, SA3OAL IOL) – 35.5±13.6%, in the third group (CeeOn 911A IOL) – 36.4±13.4 % and in the fourth group (PMMA IOL) – 33.8±13.6%. There was no difference on the overlapping of capsulorrhexis on IOL optic averages between the groups on the first day, after six and twelve months after surgery ($p>0.05$). Significant negative correlation was established between PCO values and overlapping in the first group twelve months after surgery ($r=-0.307$, $P<0.05$; Pearson correlation) (Fig. 3). Negative correlation between PCO values and overlapping in the other groups was not significant.

Table 1. **Measurements of posterior capsule opacification values in the entire intraocular lens optic area in the groups**

Evaluation time	PCO value mean±SE	PCO value mean±SE	p
	1 group	2 group	
6 months	0.002±0.001	0.007±0.002	p=0.31
12 months	0.011±0.005	0.025±0.006	p=0.02*
	1 group	3 group	
6 months	0.002±0.001	0.002±0.001	p=0.78
12 months	0.011±0.005	0.014±0.005	p=0.52
	1 group	4 group	
6 months	0.002±0.001	0.029±0.008	p=0.007*
12 months	0.011±0.005	0.122±0.021	p=0.000*
	2 group	3 group	
6 months	0.007±0.002	0.002±0.001	p=0.23
12 months	0.025±0.006	0.014±0.005	p=0.14
	2 group	4 group	
6 months	0.007±0.002	0.029±0.008	p=0.02*
12 months	0.025±0.006	0.122±0.021	p=0.000*
	3 group	4 group	
6 months	0.002±0.001	0.029±0.008	p=0.01*
12 months	0.014±0.005	0.122±0.021	p=0.000*

* difference between the means of PCO values in compared groups is statistically significant.
SE – standard deviation.

Table 2. **Measurements of posterior capsule opacification values in the central 3-mm intraocular lens optic zone in the groups**

Evaluation time	PCO value mean±SE	PCO value mean±SE	p
	1 group	2 group	
6 months	0.000±0.000	0.001±0.001	p=0.67
12 months	0.0001±0.0001	0.018±0.007	p=0.04*
	1 group	3 group	
6 months	0.000±0.000	0.000±0.000	p=1
12 months	0.0001±0.0001	0.004±0.002	p=0.77
	1 group	4 group	
6 months	0.000±0.000	0.002±0.001	p=0.06
12 months	0.0001±0.0001	0.028±0.009	p=0.002*
	2 group	3 group	
6 months	0.001±0.001	0.000±0.000	p=0.69
12 months	0.018±0.007	0.004±0.002	p=0.11
	2 group	4 group	
6 months	0.001±0.001	0.002±0.001	p=0.50
12 months	0.018±0.007	0.028±0.009	p=0.28
	3 group	4 group	
6 months	0.000±0.000	0.002±0.001	p=0.08
12 months	0.004±0.002	0.028±0.009	p=0.01*

* difference between the means of PCO values in compared groups is statistically significant.
SE – standard deviation.

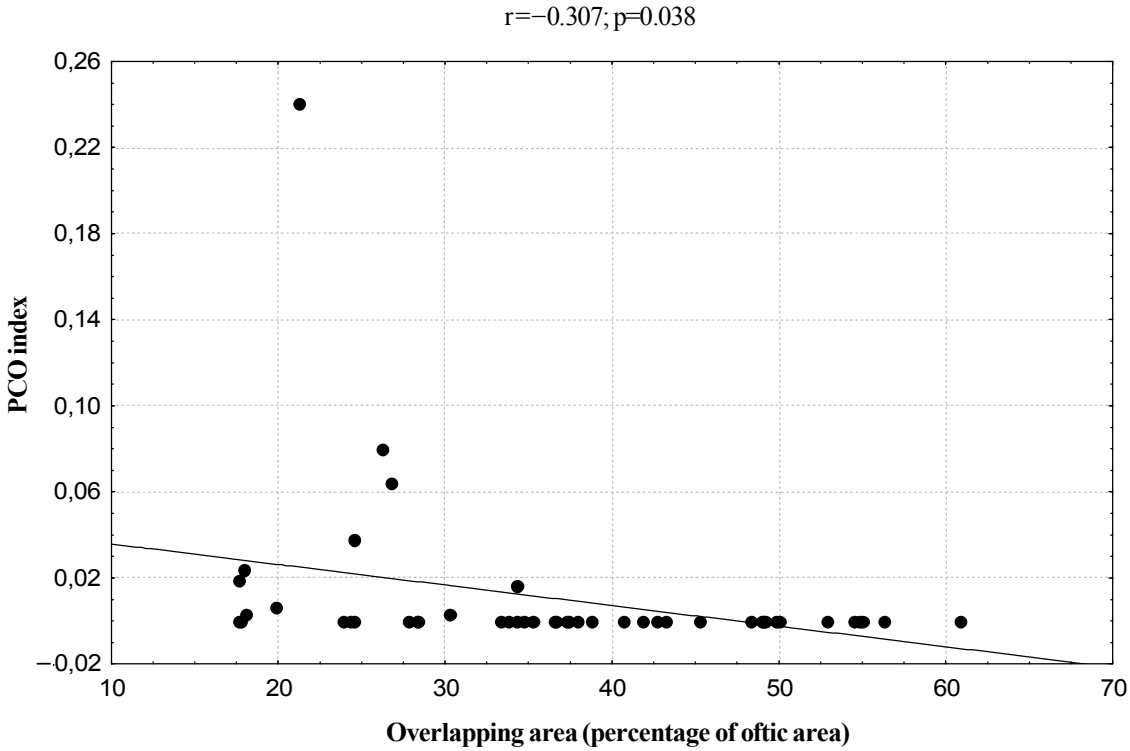

Fig. 3. **Posterior capsule opacification value correlation with the amount of anterior capsule overlapping on the IOL optic in the first group (AcrySof MA3OBA IOL) one year after cataract surgery**

Discussion

Posterior capsule opacification is the most common complication of primary cataract surgery. Formation of PCO significantly depends on the age of patients – the younger is the patient, the more rapid is PCO development. Pediatric patients are reported to have a rapid development of PCO (almost 100%) (16). The incidence of PCO reported is generally based on follow-up time after cataract surgery. In 1998, D. A. Schaumberg et al on the basis of meta analysis of literature on PCO incidence indicated a postoperative PCO incidence of 11.8% at 1 year, 20.7% after 3 years, and 28.5% after 5 years following cataract surgery (6). One main problem of studies on PCO prevalence is the variety of methods to define PCO (1, 6). Subjective methods, like visual acuity, contrast sensitivity or glare sensitivity, are influenced by a lot of confounding factors. Nd: YAG capsulotomy rate also is not an objective standard for prevalence of PCO because of highly different indication criteria of the laser surgeons and patients demand. And only evaluation of the posterior capsule can be objective method for PCO prevalence estimation.

In this clinical prospective study we had the possibility to use EPCO 2000 software system for morphological evaluation of posterior lens capsule. This system is widely in use in numerous clinical studies (14, 17). There was no eye that required treatment with Nd: YAG laser capsulotomy during one year after cataract surgery, so using Nd: YAG capsulotomy rate for evaluation of PCO incidence it was equal to zero in all four groups. Using EPCO 2000 software, we could establish significant differences among the groups.

The cause of PCO development is multifactorial, and principles of prevention of this complication are based on what is known on pathogenesis of PCO at this time. D. Apple identified six important steps for prevention or at least delay of this complication. That is surgery related factors: 1) hydrodissection-enhanced cortical cleanup; 2) in-the-bag IOL fixation; 3) relatively small (smaller than that of the IOL optic) anterior capsulorrhexis; and intraocular lens related factors ("ideal" IOL): 4) biocompatible IOL to reduce stimulation of cellular proliferation; 5) maximal IOL optic-posterior capsule contact (angulated haptic, "bioadhesive"

biomaterial); and 6) square, truncated IOL optic edge (7).

Numerous clinical and experimental studies are underway aimed at better understanding which factor – IOL material or design is more important in PCO prevention.

In 1998, O. Nishi et al demonstrated that the PCO-reducing effect is related to truncated sharp-edge IOL design. In his experimental animal study, he used sharp-edge hydrophobic acrylic (AcrySof) IOL and standard round optic edge PMMA IOL. Three weeks after surgery, O. Nishi revealed that the lens capsule wrapped tightly around the sharp optic edge and the migration of LECs was inhibited at the site of sharp rectangular lens capsule bend. It was not revealed the same sharp capsular bend in PMMA IOL group with round optic edge and therefore LECs could freely migrate into the posterior capsule center (8). Experimental studies of the other IOL with sharp-optic edge manufactured from different material (hydrophobic acrylic and PMMA (9), hydrophobic acrylic and silicone (10)) histologically determined the same sharp capsular bend. This enabled to make a conclusion that the preventive effect of IOL on posterior capsule opacification might be dependent on IOL sharp-edge optic design.

According to our study data, the intraocular lenses models with sharp-edge design (acrylic and silicone) showed significantly lower PCO values than round-edge optic design PMMA lenses ($p<0.05$). Like many other studies (8-11, 14, 18), our study confirms the theory of O. Nishi regarding sharp-edge IOL design importance in PCO prevention.

F. Casprini et al in a two-year clinical study compared PCO development using hydrophobic acrylic IOLs with different optic edge design – sharp-edge (AcrySof MA3OBA) and round-edge (Sensar AR 40). The difference of PCO development between groups was significant only at 2 years, with the MA3OBA group having less PCO. In addition, both IOL groups had a low PCO rate. This could be explained only as a result of the acrylic hydrophobic material, which strongly adheres IOL optic to the posterior capsule, reducing LEC migration by the barrier effect of the round-edged optic (19).

We evaluated three patient groups, in which eyes were implanted using foldable sharp-edge IOLs, manufactured from different materials (hydrophobic acrylate and silicone). The difference of PCO value between the groups was not statistically significant. The lowest PCO value was established in AcrySof MA3OBA (0.011±0.005) and CeeOn 911A IOL (0.014±0.005) groups one year after surgery. In AcrySof SA3OAL group PCO value was a little higher (0.025±0.006), but statistically significant difference was found only between AcrySof SA3OAL and AcrySof MA3OBA groups ($p=0.02$) and only one year after surgery. However, the difference of PCO value between AcrySof SA3OAL and CeeOn 911A IOL groups was not significant. One year follow-up time did not show superiority of any of two IOL materials (hydrophobic acrylate or silicone) on PCO prevention.

Capsulorrhexis appears to reduce PCO incidence because of symmetrical bag distension, excellent IOL stability in the bag, and good cortical residual cleaning after hydrodissection (1). The intact capsulorrhexis effectively isolates the IOL from vascular uveal tissue by cocooning the lens in an intact capsular bag, reduces the severity of the blood-aqueous barrier breakdown and the foreign-body cellular reaction on the intraocular lens surface (20). Recent studies have indicated that the frequency of PCO is much lower in cases with small capsulorrhexis where the anterior capsule was 360 degrees on the optic than in those with large capsulorrhexis (21-23).

G. Ravalico et al in their clinical study established that there exist two different patterns of PCO depending on whether the capsulorrhexis edge lies off the intraocular lens optic or completely on for 360 degrees. Their study demonstrated that with large capsulorrhexis where the capsulorrhexis edge is completely off the IOL optic, early wrinkles appear in the posterior capsule by 2 weeks and get worse with time. LECs can be seen around these wrinkles, leading to relatively severe PCO development (Fig. 4). Patients with small capsulorrhexis demonstrated a completely different pattern of PCO development. LECs were gradually spread centrally across the posterior capsule, and wrinkles were rarely seen (Fig. 5) (21). Later it was established that the wrinkles seen with large capsulorrhexis are due to anterior capsule LECs, which are able to migrate onto the posterior capsule, when the anterior capsular flap comes into contact with the posterior capsule. LECs of both equatorial and anterior capsule are important in the production of PCO, and their relative contribution depends on the rela-

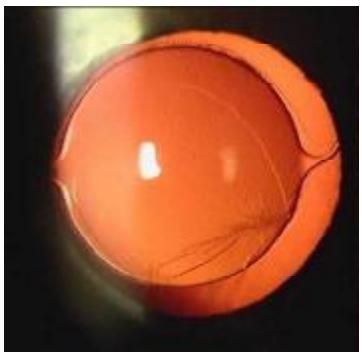

Fig. 4. **Development of posterior capsule opacification with large, decentered or incomplete anterior capsule overlapping on the IOL optic**

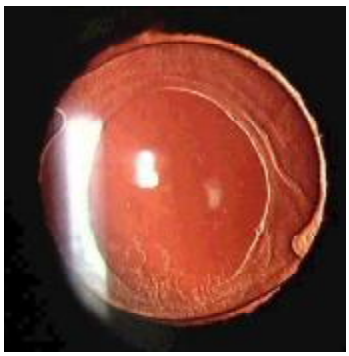

Fig. 5. **Development of posterior capsule opacification with relatively small and well-centered anterior capsulorrhexis**

tionship of the anterior capsule edge to the lens optic (22).

The effectiveness of a sharp-edge concept depends on the relationship between capsulorrhexis and optic. According to the data from recent studies, a 360-degree overlapping of the capsulorrhexis centered on the optic of the IOL is important for creation a square, sharp-edge effect. If the capsulorrhexis is decentered and off the optic edge, an ingrowth of LECs behind the IOL optic is facilitated and strong negative correlation between anterior capsule overlapping and PCO development exists (7, 10, 14, 23). In our study we established significant negative correlation between PCO values and overlapping in the first group twelve months after surgery ($r=-0.307$, $P<0.05$; Pearson correlation) (Fig. 3). Negative correlation between PCO values and overlapping in the other groups was not significant. The reason for that could be too short (one-year) follow-up period during which only very low PCO developed; and the other possible reason could be, that in our study we included only those eyes, in which complete overlapping during cataract surgery was documented.

Conclusions

The sharp-edge foldable intraocular lenses types (AcrySof MA3OBA, AcrySof SA3OAL, CeeOn 911A) showed statistically significant difference in posterior capsule opacification values in one–year follow–up period. The effect of these foldable lenses in preventing posterior capsule opacification is mainly a result of rectangular, sharp-edged optic design, which creates a sharp capsular bend.

A role of material of intraocular lenses (hydrophobic acrylate and silicone) in prevention of posterior capsule opacification was not established during one-year follow–up period.

Significant negative correlation between PCO values and overlapping was established in the first group twelve months after surgery. The lowest PCO value in this group can be explained by forming "barrier" effect when capsulorrhexis was symmetrical and relatively small.

EPCO 2000 software is an important tool for accurate testing of differences in posterior capsule opacification formation depending on various IOL styles and surgical methods markedly before the visual function decreases and the necessity to perform laser capsulotomy emerges.

Antrinės kataraktos prevencija intraokuliniais lęšiais (vienerių metų klinikinio tyrimo rezultatai)

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Rakažodžiai: kataraktos operacija, intraokulinis lęšis, antrinė katarakta, užpakalinės kapsulės drumstėjimas, priekinis kapsuloreksis.

Santrauka. Tyrimo tikslas. Įvertinti antrinės kataraktos vystymąsi priklausomai nuo implantuoto intraokulinio lęšio optinės dalies krašto formos bei medžiagos.

Tyrimo medžiaga ir metodai. Ištirti 165 tiriamieji, kurių amžiaus vidurkis operacijos metu buvo 67,5±7,8 metų. Pagal implantuotą lęšio modelį tiriamieji suskirstyti į keturias grupes: pirma grupė (n=46) – tiriamieji, kuriems implantuoti nemonolitiniai akriliniai hidrofobiniai intraokuliniai lęšiai, status optinės dalies kraštas („AcrySof“, modelis MA3OBA, „Alcon“); antra grupė (n=38) – implantuoti monolitiniai hidrofobiniai intraokuliniai lęšiai, status optinės dalies kraštas („AcrySof“, modelis SA3OAL, „Alcon“); trečia grupė (n=39) – implantuoti naujos kartos silikoniniai intraokuliniai lęšiai, status optinės dalies kraštas („CeeOn 911A“, „Pharmacia“); ketvirta grupė (n=42) – implantuoti kieti monolitiniai polimetilmetakriliniai intraokuliniai lęšiai, apvalus optinės dalies kraštas („Crystal“, tipas 5, „Alcon“). Pacientai tirti praėjus 6 ir 12 mėnesių po operacijos. Vidutinė pacientų stebėsenos trukmė – 12,4±0,9 mėnesio. Antrinė katarakta arba užpakalinės lęšiuko kapsulės drumstumas vertintas visame intraokulinio lęšio optinės dalies plote ir centrinėje 3 mm skersmens dalyje EPCO 2000 programa.

Rezultatai. Užpakalinės kapsulės drumstumo indeksas (drumsties plotas padaugintas iš intensyvumo) visame intraokulinio lęšio optinės dalies plote, praėjus pusei metų po kataraktos operacijos, pirmoje tiriamųjų grupėje buvo 0,002±0,001, antroje grupėje – 0,007±0,002, trečioje grupėje – 0,002±0,001, ketvirtoje grupėje – 0,029±0,008, o praėjus vieneriems metams po operacijos – 0,011±0,005, 0,025±0,006, 0,014±0,005 ir 0,122±0,021, atitinkamai. Nustatytas reikšmingas užpakalinės kapsulės drumstumo indekso skirtumas apvalų (polimetilmetakriliniai) ir statų (kitos grupės) optinės dalies kraštą turinčių intraokulinių lęšių grupėse ($p<0,05$).

Užpakalinės kapsulės drumstumo indeksas intraokulinio lęšio optinės dalies centrinėje 3 mm skersmens dalyje, praėjus pusei metų po kataraktos operacijos, pirmoje grupėje buvo 0,000±0,000, antroje grupėje – 0,001±0,001, trečioje grupėje – 0,000±0,000, ketvirtoje grupėje – 0,002±0,001, o praėjus vieneriems metams po operacijos – 0,0001±0,0001, 0,018±0,007, 0,004±0,002 ir 0,028±0,009, atitinkamai. Praėjus vieneriems metams po operacijos, gautas reikšmingas skirtumas tarp pirmos („AcrySof“ MA3OBA) ir ketvirtos (polimetilmetakriliniai), trečios („CeeOn 911A“) ir ketvirtos (polimetilmetakriliniai) tiriamųjų grupių ($p<0,05$).

Išvados. Statų optinės dalies kraštą turintys sulankstomi intraokuliniai lęšiai („AcrySof“ MA3OBA, „AcrySof“ SA3OAL, „CeeOn 911A“) sustabdė antrinės kataraktos vystymąsi palyginti su apvalų kraštą turinčiais kietais polimetilmetakriliniais intraokuliniais lęšiais vienerių metų laikotarpiu po operacijos. Pagrindinė šio skirtumo priežastis – status sulankstomų intraokulinių lęšių optinės dalies kraštas, atliekantis barjero funkciją. Antrinės kataraktos vystymosi skirtumo, priklausomai nuo sulankstomų intraokulinių lęšių, turinčių statų optinės dalies kraštą, medžiagos (hidrofobinio akrilo ir silikono), stebėsenos laikotarpiu neišryškėjo.

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