Graefes Arch Clin Exp Ophthalmol (2008) 246:1609–1615
DOI 10.1007/s00417-008-0886-4

INFLAMMATORY DISORDERS

Uveal and capsular biocompatibility of two foldable acrylic intraocular lenses in patients with endogenous uveitis — a prospective randomized study

Martin Roesel · Carsten Heinz · Britta Heimes · Joerg Michael Koch · Arnd Heiligenhaus

Received: 31 January 2008 / Revised: 8 June 2008 / Accepted: 10 June 2008 / Published online: 19 July 2008
© Springer-Verlag 2008

Abstract
Background To compare a hydrophobic and a hydrophilic acrylic single-piece intraocular lens (IOL) in uveitis patients with respect to biocompatibility and visual outcome.
Methods Prospective, randomized study in patients with noninfectious uveitis after phacoemulsification and implantation of either a hydrophobic AcrySof™ (group 1, $n=30$) or a hydrophilic Akreos adapt™ (group 2, $n=30$), sharp-edged acrylic IOL. The primary outcome was uveal biocompatibility, detected by giant-cell deposition, anterior chamber cell count and laserflare photometry over a 6-month follow-up period. Secondary outcome measures were capsular biocompatibility, as detected by posterior capsule opacification (PCO), lens epithelial cell outgrowth and Nd:YAG capsulotomies, and visual outcome.
Results The groups did not differ with respect to anatomic type of uveitis, immunosuppressive treatment, associated systemic disease, and intraoperative manipulation. The number of giant cells on the anterior IOL surface was higher in group 1 than in group 2 ($p=0.03$). The number of anterior chamber cells, laser flare photometry levels, and uveitis reactivations after surgery did not differ between the groups. After 6 months, the number of patients with PCO development ($p=1.0$) and Nd:YAG capsulotomies ($p=0.21$), lens epithelial cell outgrowth, visual outcome and uveitis complications were comparable in both groups.
Conclusions Both of the acrylic IOLs used had good uveal and capsular biocompatibility, leading to significant improvement in BCVA in patients with noninfectious uveitis. No obvious differences were detected at 6 months with respect to uveal and capsular biocompatibility and visual outcome.

Keywords Uveitis · Phacoemulsification · Biocompatibility · Acrylic intraocular lenses · Cataract surgery

Introduction

Cataract formation is a frequently encountered complication of uveitis [1–5]. For cataract, phacoemulsificaton and implantation of a foldable intraocular lens (IOL) is the generally preferred surgical treatment [6]. After IOL implantation, recurrence of inflammation, fibrin formation, cellular deposits on the IOL, capsule opacification, and IOL decentration and dislocation might limit the visual outcome. Previous observations suggest that small-incision surgery and implantation of foldable lenses with acrylic material provide the best results [2]. While hydrophobic and hydrophilic foldable acrylic IOLs are available and can provide good visual outcome [7], the hydrophobic type has been favored in uveitis patients.

The authors have no financial interest in any of the materials used in this study.

M. Roesel · C. Heinz · B. Heimes · J. M. Koch · A. Heiligenhaus
Department of Ophthalmology, St. Franziskus Hospital, Muenster, University Duisburg-Essen,
Duisburg, Germany

A. Heiligenhaus (✉)
Department of Ophthalmology, St. Franziskus Hospital,
Hohenzollernring 74,
48145 Muenster, Germany
e-mail: arnd.heiligenhaus@uveitis-zentrum.de

The aim of this prospective clinical trial was to compare the uveal and capsular biocompatibility of a hydrophobic and a hydrophilic acrylic, foldable, sharp-edged, single-piece IOL in patients with inactive endogenous uveitis.

Patients and methods

In this monocenter, prospective, randomized clinical trial patients suffering from chronic endogenous uveitis and with an opacified lens limiting their vision were included. Patients who had previously undergone anterior segment surgery or with other ocular diseases that frequently result in postoperative fibrin formation (e.g., perforating eye trauma or proliferative diabetic retinopathy) were excluded from this study. The study was performed in accordance with the Declaration of Helsinki. Informed consent was obtained before the surgery. The study design was approved by the local ethics committee.

Before surgery, the best-corrected visual acuity (BCVA), slit-lamp appearance, funduscopic findings, and intraocular pressure (IOP, Goldmann applanation tonometry) were recorded. The diagnostic work-up included complete blood count with differential, Lyme titers and Western blot, fluorescent treponemal antibody absorption, chest X-ray, angiotensin converting enzyme, ANA, tuberculosis skin-test, HLA-B27, creatinine, liver enzymes, blood coagulation, and MRI imaging of the brain. The patients were examined by a rheumatologist, neurologist, dermatologist, and an ear, nose, and throat consultant. Any associated diseases were documented.

In all of the patients, inactivity of inflammation (<1 + cells in the anterior chamber) was attempted for at least 3 months prior to surgery. The doses of topical and systemic corticosteroids and immunosuppressive drugs were adjusted to the individual course of uveitis. In the AcrySof group, 50% were on second-line immunosuppression (methotrexate= nine, azathioprine=five, and one on combined methotrexate and infliximab). In the Akreos group, 47% needed second line immunosuppression (methotrexate=seven, azathioprine= three, cyclosporine A=two, interferon alpha = two. In 17 of the treated patients from the AcrySof group, and in 14 patients from the Akreos group, systemic steroids were given before surgery. The mean dosage in the hydrophobic group was 5.3, and was 3.0 mg in the hydrophilic group. In addition, prednisolone acetate 1% eye drops were given five times daily for 1 week before surgery.

The operations were performed under general anesthesia. All patients received standard endocapsular phacoemulsification surgery with a limbal incision of 2.5 mm, curvilinear capsulorhexis (CCC) of approximately 5.0 mm, phacoemulsification, and irrigation-aspiration for complete removal of the lens cortex. Cells were polished from the central 5 mm of the posterior capsule, the incision was enlarged to 2.8 mm, and an IOL was implanted into the bag with an injector.

The patients were randomly divided into one of the two study groups. Patients from group 1 (n=30) received an AcrySof™ (AcrySof SA60AT, Alcon), and those in group 2 (n=30) an Akreos adapt™ (Bausch & Lomb) IOL. Other procedures carried out additionally included synechiolysis (n=15, each), iris stretching (n =6, each) and incision of pupil (group 1, n=4, group 2, n=5). Iris hooks were not used.

After the surgery, prednisolone acetate eye drops 5x, gentamycine eye drops 3x, and scopolamine eye drops 3x were given. Dosages were tapered off in the subsequent 4–6 weeks according to the individual course of inflammation. Preexisting immunosuppression was continued, and further anti-inflammatory medication was administered according to need.

Standardized follow-up evaluations were performed at 1, 3, and 6 months after surgery, including BCVA evaluation, slit-lamp examination, and ophthalmoscopy.

Inflammation in the anterior chamber was graded, and uveitis was classified anatomically in accordance with the recently published standardization [8]. Activity of anterior chamber inflammation was based on the presence of cells in the anterior chamber. Inactive anterior uveitis was defined as rare cells or less. A worsening of inflammation was defined as an at least two-step increase in the level of inflammation or to the maximum grade. Correspondingly, the number of patients with active uveitis at each given time point was recorded.

IOL deposits were analyzed and graded semiquantitatively according to Schauersberger: Giant cells, by means of large, polymorph, granular appearing phagocytes, were graded by number (0=none; 1=1–9; 2=10–25; and 3=>25) and the number of small round cells was graded by density (cells/mm^2) [9].

For laser-flare photometric assessment (Kowa FM-500, Japan), the measurement was performed ten times, and the mean was determined after deleting the lowest and highest values.

The opacification of the central 3 mm of the posterior lens capsule (PCO) was graded clinically on a scale from 0 to 3 in analogy to Abela-Formanek (0=no opacification observed; 1=transparent opacification, visible in reflecting light of the slit-lamp; 2=moderate white-gray and flat opacification, easily visible in reflecting light; and 3=dense and white opacificaton, reducing visibility of the anterior third of the vitreous) [10].

Lens epithelial cells (LECs) on the IOL typically located adjacent to the rhexis were graded according to Abela-Formanek (0=none; 1=single cell deposit at the capsulorhexis edge; 2=cell islands at the capsulorhexis edge; and 3=

Table 1 Epidemiological data of patients with phacoemulsification and AcrySof™ or Akreos adapt™ IOL implantation

	AcrySof™ (n=30)	Akreos adapt™ (n=30)
Mean age (±SD)	53.7±17.3	48.1±20.4
Male: female (n)	7/23	11 /19
Mean visual acuity (LogMAR)	0.81 (SD 0.42)	0.76 (SD 0.42)
Second-line systemic immunosuppressive drugs	50%	47%
Mean oral corticosteroids (mg±SD)	5.3±6.4	3.0±3.9
Anatomic uveitis form		
Anterior	9 (30%)	18 (60%)
Intermediate	12 (40%)	6 (20%)
Posterior	3 (10%)	4 (13%)
Panuveitis	6 (20%)	2 (7%)
Complications involving visual impairment		
Vitreous opacities	3 (10%)	1 (3%)
Cystoid macular edema	9 (30%)	9 (30%)
Macular gliosis or atrophy	6 (20%)	8 (27%)
Band keratopathy	0 (0%)	1 (3%)
Associated systemic immune-mediated diseases	13 (43%)	12 (40%)
Sarcoidosis	7	5
Spondylarthritis	3	4
Inflammatory bowel disease	2	0
Lupus Erythematodes	1	0
Behcet's disease	0	1
Juvenile idiopathic arthritis, adult	0	1
Multiple Sclerosis	0	1

Number of patients n (%)

confluent LECs at the capsulorhexis edge) [11]. After evaluating the grade in every quadrant, the mean grade of deposition was calculated. The presence of fibrinous membranes on the IOL and any IOL decentration or tilting was documented, if present.

Presence of any uveitis complication was recorded, e.g., macular edema by means of optical coherence tomography (OCT, Stratus OCT III, Carl Zeiss Meditec, Germany) or fluorescein angiography (FLA, Heidelberg Retina Angiograph 2, Heidelberg Engineering, Heidelberg, Germany), epiretinal membrane formation, and elevated intraocular pressure ≥22 mmHg.

Data were analyzed with MedCalc® Version 6.0. The data sample normality was checked using the Kolmogorov-Smirnov test. The Chi-square test and Fisher's exact test for categorical data, and t-test, Wilcoxon-test, and Mann-Whitney U-Test were used for statistical analysis when appropriate. $P<0.05$ was taken as level of significance.

Results

Epidemiological characteristics of the patients

The two groups did not differ with respect to age, anatomic type of uveitis, or associated disease. The most common systemic diseases were sarcoidosis, spondylarthritis, Behçet's disease, juvenile idiopathic arthritis, Crohn's disease, ulcerative colitis, and multiple sclerosis. The frequency of vitreoretinal pathology and of systemic immunosuppressive treatment did not differ between the groups (Table 1).

Comparison of the uveal biocompatibility

In order to compare the biocompatibility of the two different acrylic IOLs the anterior chamber cells, laser-flare values, development of synechiae, and deposition of cells on the anterior surface of the IOLs were determined (Table 2).

Deposition of giant cells on the IOL showed a peak at the 3-month evaluation. While the number of giant cells clearly declined thereafter in the Akreos group, it nearly persisted in the AcrySof™ group. The differences reached the level of significance after 6 months (p=0.03). Increasing the number of patients included most probably would have accentuated the disparity.

In both groups, the laser flaremeter (LFM) values increased after the surgery, but the differences did not reach the level of significance (p=0.78, p=0.13, p=0.20; at 1, 3, and 6 months).

While the mean number of AC cells in the AcrySof™ group peaked at the 1-month examination and decreased thereafter, the mean number of AC cells in group 2 increased up to the 3-month examination. The AC cell-number after surgery did not differ significantly between the groups (p=0.51, p=1.0, p=0.70; at 1, 3, and 6 months).

The grade and number of small round cells on the anterior surface of the IOL did not differ between the groups. Posterior synechiae developed after surgery in one patient from the AcrySof™ and in two patients from the Akreos adapt™ group ($p>0.05$).

Taken together, only a mild and transient inflammation was seen after implantation of the two different IOLs used in the present study. Compared with the AcrySof™ IOL, uveal biocompatibility of the hydrophilic Akreos adapt™ was not obviously better.

Comparison of the capsular biocompatibility

Posterior capsule opacification, lens epithelial cell outgrowth and number of Nd:YAG laser capsulotomies were evaluated in order to compare the capsular biocompatibility of the two IOLs (Table 3).

Table 2 Uveal biocompatibility after phacoemulsification with implantation of an AcrySof™ or Akreos adapt™ IOL in a group of patients with noninfectious uveitis (n=30, each)

	Before surgery	After 1 month	After 3 months	After 6 months
Giant cells on IOL				
AcrySof™ (%) (Mean ± SD)	-	15% (0.22±0.57)	32% (0.56±0.94)	42%# (0.54±0.71)
Akreos adapt™ (%) (Mean ± SD)	-	8% (0.12±0.42)	16% (0.20±0.49)	8% # (0.13±0.44)
Anterior chamber cells				
AcrySof™ (%) (Mean ± SD)	7%* (0.07±0.25)	23% (0.30±0.59)	23% (0.23±0.42)	13% (0.17±0.47)
Akreos adapt™ (Mean ± SD)	9%* (0.09±0.29)	14% (0.14±0.34)	21% (0.25±0.51)	21% (0.29±0.68)
Laserflare photometry (Ph/s)				
AcrySof™ (Mean ± SD)	21.3±11.1	27.1±17.4	26.8±20.5	28.5±19.9
Akreos adapt™ (Mean ± SD)	23.6±12,1	25.9±16.5	25.4±15.1	24.0±15.1
Posterior Synechiae (n)				
AcrySof™	-	1	1	1
Akreos adapt™	-	1	1	1

# $p<0.05$ between groups at given time-point. ≥1 + cells detected in percentage of patients, (mean cell count ±SD); *<1 + cells

The number of patients who developed PCO in the two groups did not differ over the complete follow-up period. Indeed, 6 months after surgery, 83% of the patients receiving an AcrySof™ IOL, and 84% of the patients receiving an Akreos adapt™ IOL had developed a PCO (p=1.0). In addition, the numbers of Nd:YAG laser capsulotomies that had been performed at 6 months after surgery did not differ significantly between the groups (p=0.21). As the degree of the PCO was not significantly different, the capsular biocompatibility of the two IOLs implanted in our study patients was also comparable.

Mean lens epithelial cell outgrowth reached a maximum 3 months after surgery in both groups. However, the differences between the groups concerning IOLs involved and the mean rate of lens epithelial cell outgrowth were not significant (p=1.0, p=0.70, p=1.0; at 1, 3, and 6 months).

Influence on best corrected visual acuity

When compared to baseline, the BCVA at the diverse time points after surgery improved significantly in both groups ($p<0.01$) and visual acuity had increased by two or more lines in most of the patients (Table 4). Notably, the visual course did not differ between the groups.

Uveitis complications occurring during the six postoperative months

Reactivation of inflammation occurred in three patients in the AcrySof™ and in four patients in the Akreos adapt™ group and was treated by increasing the dosage of topical prednisolone acetate, or orbital floor (40 mg), or intravitreal triamcinolone acetonide (4 mg), as required. In addition, the postoperative anti-inflammatory therapy, as defined by the number of patients receiving systemic corticosteroids and the respective mean dosages, the number of patients receiving immunosuppressive treatment, and the mean number of drugs used in each patient, did not differ between the groups. The second-line immunosuppression was maintained after surgery, and there were no dosage alterations over the 6 months follow-up period in both groups. The number of patients in whom CME was detected postoperatively and presenting with intraocular pressure ≥22 mmHg and epiretinal membrane formation did

Table 3 Capsular biocompatibility: Posterior capsule opacification (PCO), Nd:YAG laser capsulotomies performed, lens epithelial cells (LEC) on IOL after phacoemulsification with implantation of an AcrySof™ or Akreos adapt™ IOL (n=30, each)

	After 1 month	After 3 months	After 6 months
PCO			
AcrySof™	42% (0.42±0.49)	56% (0.84±0.83)	83% (0.94±0.62)
Akreos adapt™	56% (0.92±0.98)	73% (0.95±0.71)	84% (1.37±0.87)
Nd:YAG performed			
AcrySof™	-	-	21%
Akreos adapt™	-	-	12%
LEC			
AcrySof™	19% (0.27±0.59)	20% (0.28±0.66)	8% (0.13±0.44)
Akreos adapt™	15% (0.15±0.36)	12% (0.20±0.49)	4% (0.04±0.20)

Detected in percentage of patients (mean score ±SD)

Table 4 Phacoemulsification with AcrySof™ or Akreos adapt™ IOL implantation

		Months after surgery		
	Pre-surgery	1 month	3 months	6 months
AcrySof™				
Mean (LogMAR)	0.81±0.42	0.35*±0.35	0.36*±0.35	0.35*±0.39
≥ 2 lines improvement		24 (80%)	24 (92%)	21 (84%)
Akreos adapt™				
Mean (LogMAR)	0.76±0.42	0.31*±0.29	0.23*±0.25	0.25*±0.23
≥ 2 lines improvement n (%)		26 (87%)	26 (90%)	22 (92%)

Best corrected visual acuity (BCVA, LogMAR±SD) before and after surgery, number and percentage of eyes with increasing VA of two or more lines (n=30, each)

*p<0.01 as compared to baseline. No significant difference between the two groups.

not differ between the groups (Table 5). No further complications occurred in any of the patients in this study. In particular, none of the patients developed IOL dislocation or decentration, endophthalmitis, or retinal detachment.

Discussion

This is the first prospective, randomized clinical trial that compares the uveal and capsular biocompatibility of a hydrophobic (AcrySof™) and a hydrophilic (Akreos adapt™) sharp-edged, single-piece acrylic foldable IOL in non-infectious uveitis patients.

Acrylics are chemical substances that contain the acrylic group, e.g., acrylic acid or acrylic ester. They can be cross-linked with polymerization. Adherent –OH or –CH3 groups are decisive for hydrophobia (-CH3) or hydrophilia (-OH). Hydrophobic substances tend to be nonpolar and are repelled from a mass of water. Hydrophilic molecules are capable of bonding water and are polar. Rauz et al. stated that the inflammatory response produced by an IOL implant is inversely related to its biocompatibility [12].

Table 5 Uveitis complications developing after phacoemulsification and implantation of an AcrySof™ or Akreos adapt™ IOL

	AcrySof™	Akreos adapt™
Uveitis recurrence	3	4
Fibrin formation	0	0
IOL decentration	0	0
IOL dislocation	0	0
Intraocular pressure ≥22 mmHg	2	3
Macular edema	8	7
Endophthalmitis	0	0
Retinal detachment	0	0
IOL exchange	0	0

Influence on uveal biocompatibility

Deposits on the IOL surface consist of foreign-body giant cells and small round cells. Giant cells are formed by epithelioid cells and are differentiated from macrophages. In our study, the number of patients with giant cells on the IOL surface was significantly higher in the hydrophobic group at 6 months after surgery. These results are in close accordance with those of other authors: Rauz et al. found giant cells in 31.7%, more frequently on hydrophobic acrylic IOLs than on silicone or Hydroview, but the differences were not statistically significant [12]. Abela-Formanek et al. found significantly more foreign-body giant cells on a hydrophobic multi-piece AcrySof™ than on a hydrophilic Hydroview [10]. Schauersberger et al. found increased foreign-body giant cell reactions in a hydrophobic IOL as compared to a silicone IOL [9].

Small round cells are usually seen in the early postoperative period [11]. Schauersberger et al. did not observe significant numbers of small round cells on any IOLs in a group of patients without uveitis [9], nor did Alio et al. find significant differences in small round cell or giant cell deposition between hydrophobic acrylic, silicone, or PMMA IOLs in patients with a history of uveitis [7]. However, hydrophobic and hydrophilic IOLs were not separately analyzed. In our study we did not find any differences in small round cell deposition between the two groups over the observation period. Abela-Formanek et al. found more small round cells on the hydrophobic IOL than on a hydrophilic Hydroview after 3 months in uveitic patients [10]. However, the hydrophilic IOL used in our study differed with respect to material and design.

Laser flare is a parameter for breakdown of the blood–aqueous barrier. Laserflare values in this study were not different in the two study groups during the follow-up period. Miyake et al. found higher laser flare values in eyes with silicone IOL than in eyes with an acrylic lens, but that study was not designed for uveitic patients [13]. Abela-Formanek et al. did not observe significant differences

between a silicone, a hydrophilic, and a hydrophobic acrylic IOL in uveitis patients [14].

The number of eyes that developed posterior synechiae after phacoemulsification with either hydrophobic or hydrophilic IOL did not differ significantly in our study. This confirms previous observations [10]. Alio et al. reported the presence of synechiae, especially in eyes with silicone IOLs [7]. In the study of Rauz et al., significant posterior synechiae were also noted in patients with acrylic IOLs [12]. Other influencing factors such as the type and severity of uveitis are likely more relevant for the development of posterior synechiae.

Consequently, both the hydrophobic and hydrophilic acrylic IOL provide satisfactory uveal biocompatibility and, considering the data from our study, show no obvious advantages for the hydrophilic IOL. It is unlikely that the differences in postoperative course of inflammation are related to the study population, the postoperative course of disease, and the anti-inflammatory medication as the groups did not differ in this regard before randomization to IOL implantation, nor did the postoperative medication differ significantly.

Influence on capsular biocompatibility

In our series of uveitis patients, the hydrophobic and hydrophilic acrylic IOLs did not differ with respect to the number of eyes affected in terms of PCO density and PCO rate and the number of eyes treated with Nd:YAG laser posterior capsulotomy. These observations are also in agreement with most previous reports [7, 10, 12].

While Alio et al. found significantly less PCO with acrylic and with HSM PMMA IOLs than with silicone IOLs in uveitis patients [7], Miyake et al. found no differences between a silicone and an acrylic IOL in patients without a history of uveitis [13]. Rauz et al. did not detect any differences concerning PCO between acrylic and other IOL biomaterials [12]. Abela-Formanek et al. reported a slightly better PCO rate with the hydrophobic IOL than with a hydrophilic acrylic IOL [10, 11]. However, the hydrophilic IOL used in their study (Hydroview, Bausch & Lomb) had a round-edge optic design, whereas the hydrophilic acrylic IOL in our study had a different design with sharp edge. The differences in PCO rate may possibly be explained by the different design of IOLs used. Indeed, as Schauersberger et al. observed no significant differences concerning ACO and PCO between hydrophobic acrylic IOLs and a silicone IOL, this author already suggested that the IOL design may be more important than the IOL material for PCO development [9].

In this study, the lens epithelial cell responses did not differ during the follow-up period for the two acrylic lenses. Abela Formanek et al. observed significantly more lens epithelial cell outgrowth with a hydrophilic acrylic IOL than for a hydrophobic acrylic IOL, but in that study a multi-piece AcrySof™ IOL and a hydrophilic acrylic IOL different from the ones in our study were used [11].

While both of the IOLs used in the present study have a sharp edge, the designs differ in some respects. The Akreos adapt™ has four haptics, and the optic body measures 6.0 mm in diameter. As the diameter of the capsular bag may increase with the axial length of the eye, the total diameter ranges from 10.5 to 11.0 mm, depending on its refractive power. The AcrySof™ IOL has C-shaped haptics and an optic diameter of 6.0 mm. The total diameter, including haptics, is 11.5 mm. The effect of these differences in design of the two IOLs cannot be determined from the observations of this study, however.

Influence on BCVA

In accordance with findings reported by other authors, visual acuity increased after phacoemulsification and intraocular lens implantation in most patients with inactive endogenous uveitis [1, 3, 4, 15–18]. Rauz et al. reported an improvement in BCVA in 93.3% of the patients [12]. In that study, acrylic, silicone, and hydrogel IOLs were implanted. Elgohary et al. found an improvement of two or more lines in 71.3% at final examination [1]. Hydrogel, silicone, and PMMA IOLs were used in that study. Foster et al. observed an improvement in BCVA in 97.4% [19]. Kawaguchi et al. reported an improvement in BCVA in 84.7% of patients and 74.0% had a visual acuity of 0.5 or better [3]. Krishna et al. found improved visual acuity in 94.0% [4]. Moschos et al. achieved an improvement in the mean BCVA from 0.3±0.3 to 0.8±0.3 after phacoemulsification with in-bag implantation [17]. An 87% improvement in BCVA of two or more lines was obtained in Suresh's study [18]. Alio et al. found highly significant ($p<0.0001$) improvement in BCVA in uveitic patients with acrylic, silicone, polymethyl methacrylate (PMMA), and heparin-surface-modified PMMA. In Alio's study, acrylics and PMMA IOLs provided better visual outcome than silicone IOLs [7].

In our study, the mean BCVA improved significantly in most of the patients after surgery in both groups ($p<0.01$), and no significant difference was noted. This suggests that satisfactory visual outcome can be achieved with both a hydrophobic or hydrophilic acrylic IOL.

Complications

The number of patients in whom inflammation recurred, CME was detected postoperativey, and who presented with an intraocular pressure ≥22 mmHg and epiretinal membrane formation did not differ between the groups. No further complications such as IOL dislocation or decentra-

tion, endophthalmitis, or retinal detachment occurred in any of the patients in this study.

Taken together, a good visual outcome was achieved with both acrylic IOLs. Implantation of both the hydrophobic and the hydrophilic IOL was safe, the surgically induced postoperative inflammation mild, and inflammatory recurrence rare. No marked differences were observed during the 6-month postoperative period concerning uveal and capsular biocompatibility.

References

1. Elgohary MA, McCluskey PJ, Towler HM et al (2007). Outcome of phacoemulsification in patients with uveitis. Br J Ophthalmol 91(7):916–921
2. Foster CS, Rashid S (2003) Management of coincident cataract and uveitis. Curr Opin Ophthalmol 14:1–6
3. Kawaguchi T, Mochizuki M, Miyata K, Miyata N (2007) Phacoemulsification cataract extraction and intraocular lens implantation in patients with uveitis. J Cataract Refract Surg 33:305–309
4. Krishna R, Meisler DM, Lowder CY, Estafanous M, Foster RE (1998) Long-term follow-up of extracapsular cataract extraction and posterior chamber intraocular lens implantation in patients with uveitis. Ophthalmology 105:1765–1769
5. Okhravi N, Morris A, Kok HS et al (2007) Intraoperative use of intravitreal triamcinolone in uveitic eyes having cataract surgery: pilot study. J Cataract Refract Surg 33:1278–1283
6. Dada T, Dhawan M, Garg S, Nair S, Mandal S (2007) Safety and efficacy of intraoperative intravitreal injection of triamcinolone acetonide injection after phacoemulsification in cases of uveitic cataract. J Cataract Refract Surg 33:1613–1618
7. Alio JL, Chipont E, BenEzra D, Fakhry MA (2002) Comparative performance of intraocular lenses in eyes with cataract and uveitis. J Cataract Refract Surg 28:2096–2108
8. Jabs DA, Nussenblatt RB, Rosenbaum JT (2005) Standardization of uveitis nomenclature for reporting clinical data. Results of the First International Workshop. Am J Ophthalmol 140:509–516
9. Schauersberger J, Amon M, Kruger A, Abela C, Schild G, Kolodjaschna J (2001) Comparison of the biocompatibility of 2 foldable intraocular lenses with sharp optic edges. J Cataract Refract Surg 27:1579–1585
10. Abela-Formanek C, Amon M, Schauersberger J, Kruger A, Nepp J, Schild G (2002) Results of hydrophilic acrylic, hydrophobic acrylic, and silicone intraocular lenses in uveitic eyes with cataract: comparison to a control group. J Cataract Refract Surg 28:1141–1152
11. Abela-Formanek C, Amon M, Schauersberger J et al (2002) Uveal and capsular biocompatibility of 2 foldable acrylic intraocular lenses in patients with uveitis or pseudoexfoliation syndrome: comparison to a control group. J Cataract Refract Surg 28:1160–1172
12. Rauz S, Stavrou P, Murray PI (2000) Evaluation of foldable intraocular lenses in patients with uveitis. Ophthalmology 107:909–919
13. Miyake K, Ota I, Miyake S, Maekubo K (1996) Correlation between intraocular lens hydrophilicity and anterior capsule opacification and aqueous flare. J Cataract Refract Surg 22(Suppl 1):764–769
14. Abela-Formanek C, Amon M, Schild G et al (2002) Inflammation after implantation of hydrophilic acrylic, hydrophobic acrylic, or silicone intraocular lenses in eyes with cataract and uveitis: comparison to a control group. J Cataract Refract Surg 28:1153–1159
15. Akova YA, Kucukerdonmez C, Gedik S (2006) Clinical results of phacoemulsification in patients with uveitis. Ophthalmic Surg Lasers Imaging 37:204–211
16. Estafanous MF, Lowder CY, Meisler DM, Chauhan R (2001) Phacoemulsification cataract extraction and posterior chamber lens implantation in patients with uveitis. Am J Ophthalmol 131:620–625
17. Moschos MM, Bui MA, Guex-Crosier Y (2004) Phacoemulsification with intraocular lens implantation in patients with uveitis. Klin Monatsbl Augenheilkd 221:324–327
18. Suresh PS, Jones NP (2001) Phacoemulsification with intraocular lens implantation in patients with uveitis. Eye 15:621–628
19. Foster RE, Lowder CY, Meisler DM, Zakov ZN (1992) Extracapsular cataract extraction and posterior chamber intraocular lens implantation in uveitis patients. Ophthalmology 99:1234–1241