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Cataract Surgery Outcomes in Patients with Chronic or Recurrent Uveitis

Kronik veya Tekrarlayan Üveitik Hastalarda Katarakt Cerrahisi Sonuçlarımız

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ABSTRACT Objective: To investigate the outcomes of phacoemulsification and posterior intraocular lens implantation (IOL) in patients with chronic or recurrent uveitis. **Material and Methods:** The records of 84 patients, who had phacoemulsification and IOL implantation between 2010 and 2015, were retrospectively examined. The main outcomes were final visual acuity, postoperative complications, the presence of relapse, the clinical features of patients who suffered a recurrence of intraocular inflammation and the effect of triamcinolone acetonide injection into the anterior chamber during surgery on the recurrence of inflammation after cataract surgery within the first 6 months. **Results:** The study included 109 eyes of 84 patients. The mean follow-up time was 52.6±41.8 (9-224) months. During the follow-up, posterior capsule opacification occurred in 48 (44.0%), deposits on the IOL surface in 19 (17.4%), posterior synechiae in 2 (1.8%), epiretinal membrane in 4 (3.6%), glaucoma in 7 (6.4%), and macular edema in 5 (4.5%) patients. The best corrected visual acuity with the Snellen chart at the final visit was ≤0.16 in 66.7% of serpiginous choroidopathy patients and 38% of Behçet patients. These rates were higher than with other clinical etiologies. Recurrence of uveitis within 6 months after cataract surgery occurred in 15 (13.7%) eyes. Recurrence was most common in patients with Behcet's disease. Pre-existing macular lesions were accompanied by poor visual outcomes. There was no difference between the eyes administered triamcinolone into the anterior chamber or not, regarding the frequency of attacks within the first 6 months or the postoperative complications. **Conclusion:** Cataract surgery outcomes in patients with uveitis are satisfactory. However, patients with Behcet's disease have higher risk for relapse of intraocular inflammation and worse visual outcomes.

Keywords: Cataract; triamcinolone; uveitis; visual acuity

ÖZET Amaç: Kronik veya tekrarlayan üveitik hastalarda fakoemülsifikasyon ve arka kamara göz içi lensi (GİL) yerleştirilen hastaların sonuçlarını değerlendirmek. **Gereç ve Yöntemler:** 2010 ila 2015 yılları arasında fakoemülsifikasyon ve arka kamara GİL'i yerleştirilen 84 hastanın kayıtları geriye dönük olarak incelendi. Sonuçların değerlendirilmesinde, sonuç görme keskinliği, cerrahi sonrası komplikasyonlar, atak varlığı, cerrahiyi takiben ilk 6 ay içerisinde atak geçiren hastaların özellikleri ve cerrahi esnasında ön kamaraya triamsinolon verilen hastalarda inflamasyon aktivitesi üzerine olan etkisi değerlendirildi. **Bulgular:** Çalışma, 84 hastanın 109 gözünü kapsamaktaydı. Ortalama takip süresi 52,6±41,8 (9-224) ay idi. Takip süresi boyunca, arka kapsül kesafeti 48 (%44,0), GİL'nin ön yüzeyinde birikim 19 (%17,4), arka sineşiler 2 (%1,8), epiretinal membran 4 (%3,6), glokom 7 (%6,4) ve maküler ödem 5 (%4,5) hastada mevcut idi. Son vizitte Snellen eşeli ile en iyi düzeltilmiş görme keskinliği serpijinöz koroidopatili olguların %66,7'sinde, Behçet hastalarının %38'inde ≤ 0,16 idi. Diğer klinik etyolojilere göre bu oran daha yüksekti. Katarakt cerrahisi sonrası 6 ay içerisinde atak gelişimi 15 (%13,7) gözde mevcuttu. En sık atak Behçet hastalığında idi. Önceden var olan maküler lezyon zayıf görsel sonuç ile ilişkiliydi. Ön kamaraya triamsinolon verilen ile verilmeyen gözler arasında ilk 6 ay içerisinde atak sıklığı veya ameliyat sonrası gelişen komplikasyonlar açısından fark yoktu. **Sonuç:** Üveitik hastalarda katarakt cerrahisi sonuçları memnuniyet vericidir. Ancak, Behçet hastaları, göz içi inflamasyonun aktivasyonu ve kötü görsel sonuç açısından yüksek riske sahiptir.

Anahtar Kelimeler: Katarakt; triamsinolon; üveit; görme keskinliği

A cataract can be found in up to 50% of uveitic eyes depending on the subtype of uveitis, the duration, intensity, and the treatment of ocular inflammation.[1-3] Favorable visual outcomes with standard phacoemulsification and simultaneous intraocular lens implantation (IOL) have been reported in many studies, with the absence of perioperative inflammation.[4-9]

The inflammation in uveitis patients can be effectively controlled with the common use of potent immunomodulatory agents and waiting for an attack-free period of at least 3 months before performing surgery. Postoperative complications such as cystoid macular edema (CME) and epiretinal membrane (ERM) can develop in uncontrolled cases and sometimes, complications may be so severe that it may even be necessary to remove IOL as in juvenile idiopathic arthritis patients. Additionally, the results can vary with pre-existing macular lesions such as perifoveal chorioretinal scarring, optic neuropathy, and corneal scarring.[10,11]

The purpose of this study was to analyze the clinical and visual outcomes following phacoemulsification with posterior chamber intraocular lens implantation in different subtypes of uveitis. We investigated the rate of relapse and clinical features in patients who suffered a relapse of intraocular inflammation within the first 6 months after cataract surgery. Also, our aim was to evaluate the efficacy of triamcinolone acetonide injection into the anterior chamber in case of inflammation recurrence in the first six months after cataract surgery and postoperative complications during the follow-up period.

MATERIAL AND METHODS

The clinical data of all patients with a history of uveitis who developed a cataract requiring surgery at the Ulucanlar Eye Training and Research Hospital were included in this retrospective study. All the study procedures were conducted in accordance with the Declaration of Helsinki, and informed consent was obtained from the participants after approval from the Institutional Review Board of the Yenimahalle Training and Research Hospital.

The collected data included sex, age at the diagnosis of uveitis, age at the time of cataract surgery, etiology of uveitis, type of uveitis, preoperative findings, interval between the last inflammatory episode and surgery, follow-up period, postoperative follow-up time, immediate preoperative and last visit best corrected visual acuity (BCVA), previous, current topical and systemic treatment, and development of postoperative complications.

The ophthalmologic examination performed at every visit included measurement of the best-corrected Snellen visual acuity, slit-lamp biomicroscopy, intraocular pressure (IOP) measured with an applanation tonometer or non-contact tonometer, and dilated fundus examination with a 90-diopter lens. All complications (including CME, ERM, posterior and anterior synechiae, pupillary capture of the IOL, recurrence of inflammation, glaucoma, posterior capsule opacification (PCO), and deposits on the IOL surface) were recorded. The visual acuity was measured with a Snellen chart at 6 meters and converted into the log minimum angle of resolution (logMAR) equivalent for statistical analysis.

The International Uveitis Study Group classification of uveitis guidelines were used for the classification of uveitis diagnoses.[14] The anterior and/or vitreus reaction was measured by biomicroscopic examination. The number of inflammatory cells was graded using a 1 x 1 mm high-powered beam at full intensity as 0-trace (<1 cell), 0.5+ (1-5 cells), 1+ (6-15 cells), 2+ (16-25 cells) and 3+ (26-50 cells), 4+ (>50 cells) cells too numerous to count. Patients with less than 0.5+ cells in the anterior chamber or vitreus were accepted to be in remission. Reactivation of uveitis was recorded when eyes presented with inflammation in the anterior and/or posterior segment during any of the postoperative visits within 6 months after surgery. Before performing surgery, the intraocular inflammation had to be under control for at least 3 consecutive months.

All patients with a minimum follow-up of 6 months after cataract surgery were eligible for in-

clusion. Patient who had undergone surgery by a different surgeon, cases where a different IOL material had been used, patient who had undergone combined vitrectomy and cases with postoperative follow-up of less than 6 months were excluded from the study.

SURGICAL MANAGEMENT

The surgery was performed under local (topical or peribulbar) anesthesia except in younger patients. General anesthesia was used for patients younger than 18 years. After a clear corneal incision was made, a continuous curvilinear capsulorrhexis was created and phacoemulsification and phacoaspiration were performed. Small pupils were managed by synechiolysis with viscoelastic material or multiple sphincterotomies were done. The iris was stretched with iris hooks or iris retractors as needed. An acrylic hydrophobic lens (Acrysoft MA60U, Alcon Laboratories, Inc.) was implanted in all patients. Intracameral cefuroxime 1.0 mg/0.1 cc was administered at the end of the surgery. Additionally, 0.1 ml preservative-free triamcinolone 4 mg/0.1 ml was administered using a Rycroft cannula in 31 (28.4%) eyes.

All surgeries were performed from October 2010 thorough February 2015 by two experienced surgeons (PO and FO). All cases were examined preoperatively, and postoperatively at 1 day, first and second week, the first month, 2, 3, 6 months and then every six months by one uveitis specialist (PO). This schedule was changed if any symptoms were present. A complete ophthalmic examination was performed at every postoperative visit. The grade of intraocular inflammation, BCVA, posterior segment involvement, intraocular pressure, current topical and/or systemic treatment, and ocular complications were recorded.

We divided the patients into two groups as Group-1 with an intracameral triamcinolone injection and Group-2 without triamcinolone. We especially aimed to analyse the presence of an attack and compare the number of attacks 6 months after cataract surgery and the postoperative complications between two groups.

Glaucoma was defined in the presence of IOP ≥ 21 mmHg and optic disc cupping, and/or glaucomatous visual field loss despite IOP < 21 mmHg. CME was defined as the development of retinal thickening or cystoid degeneration that could be identified clinically or angiographically or on optical coherence tomography (OCT). Posterior capsule opacification was diagnosed as clinically significant when it caused symptoms of blurred vision or glare, impaired visual acuity or reduced posterior segment view, and was treated with Nd: YAG capsulotomy more than 6 months after surgery.

PERIOPERATIVE TREATMENT

At the time when the decision for surgery was made, the inflammation had been controlled for a minimum of 3 months. Before the operation, maintenance anti-inflammatory treatment consisted of immunomodulatory drugs (cyclosporine, azathioprine, interferon alpha, infliximab and methotrexate) in 66 (60.5%) eyes, low-dose systemic corticosteroids (≤10 mg/day) in 17 (15.6%) eyes, anti-tuberculous treatment (rifampin, isoniazide) in 2 (1.8%) eyes and virus-associated uveitis treatment (acylovir, valacyclovir hydrochloride) in 8 (7.3%) eyes.

PREOPERATIVE MANAGEMENT

We used topical prednisolone-acetate in all (4-16 drops per day) eyes and 0.5-1 mg/kg per day systemic methyprednisolone in 45 (41.2%) patients for one week before the surgery depending on the etiology.

POSTOPERATIVE TREATMENT

Postoperative management consisted of topical moxifloxacin 0.5% 6 times daily for 10 days, and prednisolone-acetate every hour when awake for a few days with the dose related to the intensity of the anterior chamber reaction and tapered and then stopped over 8 weeks. Tropicamide 1% was used twice daily for the first two weeks, then once a day for 2 weeks. Topical nepafenac was also administered 3 times daily for 4 weeks. Systemic corticosteroids were tapered weekly, using 8 mg decrements.

STATISTICAL ANALYSIS

All the statistical analyses were carried out using the SPSS 22.0 statistical analysis program. The data were tested for normality using the Kolmogorov-Smirnov test. Descriptive statistics were presented as mean ± standard deviation and as median (minimum-maximum) and frequency (percentages) for qualitative data. Two-way repeated measures ANOVA was used to compare preoperative and postoperative visual acuities. The differences between the two groups were evaluated with the independent t-test and chi-square test. A p value < 0.05 was considered as statistically significant.

RESULTS

One hundred and nine eyes of 84 patients with a history of chronic or recurrent uveitis who developed cataract requiring surgery were included in this study. The mean age at diagnosis of the 42 (50%) men and 42 (50%) women was 35.5 ± 14.0 years (range 3 to 66 years), and the mean age at cataract surgery was 39.0 ± 13.7 years (range 7 to 68 years). Five (5.9%) patients were ≤16 years old at the time of cataract surgery. The total follow-up time was 52.6 ± 41.8 months (9-224 months) and the mean follow-up time after cataract surgery was 23.1 ± 20.1 months (6-94 months). In 25 (29.7%) patients, both eyes had cataract surgery. The mean period for quiescence of inflammation before surgery was 11 months (range 3-141 months). The diagnosis was anterior uveitis in 41 (37.6%) eyes, intermediate uveitis in 11 (10.1%) eyes, posterior uveitis in 2 (1.8%) eyes, and panuveitis in 55 (50.5%) eyes. Clinical etiologies of uveitis are shown (Table 1).

A significant visual acuity improvement was observed between the preoperative and the final visit (two-away repeated measures ANOVA, p<0.001). The preoperative mean BCVA was 1.16 ± 0.73 (3.10-0.4) logMAR, and the postoperative mean BCVA was 0.44 ± 0.70 (3.10-0.0) logMAR. At the final visit, 79 (%72.4%) eyes had gained ≥ 2 Snellen lines of visual improvement, and 68 (62.3%) eyes had 20/40 or better BCVA. However, 8 of the operated eyes showed no changes of visual acuity and 4 eyes had decreased BCVA at the final visit. Among these patients who did not experience any increase or had decreased visual acuity, 10 (66.6%) had optic atrophy, macular scar with macular retinal pigment epithelium (RPE) changes, or retinal vasculitis sequelae. One of the other two eyes (8.3%) had a macular scar while the other had a corneal nephelion with a macular scar.

The preoperative and postoperative BCVA values of the eyes by etiology are presented in Table 2. Accordingly, the Fuchs uveitis syndrome (FUS) group had the best prognosis, while the serpiginous choroidopathy and Behcet's disease group had the worst prognosis. The BCVA with the Snellen chart at the final visit was ≤0.16 in 66.7% of serpiginous choroidopathy patients and 38% of Behçet patients and these were the highest rates among the etio-

TABLE 1: Clinical etiology of uveitis.

Clinical Etiology	Number of patients (%)	Number of eyes (%)
Behcet's Disease	25 (29.7%)	36 (33.0%)
Fuchs Uveitis Syndrome	25 (29.7%)	25 (22.9%)
Idiopathic uveitis	12 (14.2%)	19 (17.4%)
Vogt-Koyanagi-Harada disease	5 (5.9%)	7 (6.4%)
Viral anterior uveitis	4 (4.7%)	4 (3.6%)
HLA-B27 uveitis	2 (2.3%)	3 (2.7%)
Serpiginous choroidopathy	2 (2.3%)	3 (2.7%)
Others*	9 (10.7%)	12 (11.0%)

*: Multiple sclerosis (2 eyes), ocular tuberculosis (2 eyes), rheumatoid arthritis (2 eyes), juvenile idiopathic arthritis (1 eye), Fuchs uveitis syndrome and ankylosing spondylitis (1 eye), Vogt-Koyanagi-Harada disease and herpetic iridocyclitis (1 eye), multiple sclerosis and Fuchs uveitis syndrome (1 eye), Behcet's disease and Fuchs uveitis syndrome (1 eye), sympathetic ophthalmia (1 eye).

TABLE 2: The best corrected visual acuity (BCVA) before and after cataract surgery according to etiology.

	Visual Acuity, LogMAR, mean ± SD	
Clinical Etiology (n)	**Preoperative (min-max)**	**Last Visit (min-max)**
Behcet's Disease[36]	1.40±0.89 (0.40-3.10)	0.81±0.93 (0.0-3.10)
Fuchs Uveitis Syndrome[25]	0.89±0.69 (0.40-3.10)	0.03±0.04 (0.0-0.10)
Idiopathic uveitis[17]	1.39±0.62 (0.40-2.10)	0.61±0.64 (0.0-2.10)
VKH[7]	0.94±0.51 (0.4-1.80)	0.25±0.37 (0.0-0.80)
Viral anterior uveitis[4]	1.15±0.69 (0.5-2.1)	0.10±0.11 (0.0-0.20)
Serpiginous choroidopathy[3]	1.07±0.51 (0.5-1.51)	0.86±0.66 (0.10-1.30)
HLA-B27 uveitis[3]	1.15±0.69 (0.5-2.10)	0.10±0.11 (0.0-0.2)
Others*[14]	0.95±0.45 (0.4-2.1)	0.24±0.41 (0.0-1.51)

*: Pars planitis (2 eyes), multiple sclerosis (2 eyes), ocular tuberculosis (2 eyes), rheumatoid arthritis (2 eyes), juvenile idiopathic arthritis (1 eye), Fuchs uveitis syndrome and ankylosing spondylitis (1 eye), Vogt-Koyanagi-Harada disease (VKH) and herpetic iridocyclitis (1 eye), multiple sclerosis and Fuchs uveitis syndrome (1 eye), Behcet's disease and Fuchs uveitis syndrome (1 eye), sympathetic ophthalmia (1 eye).

logical groups. The Behcet group had macular scar and retinal vasculitis sequelae in 24 (66.6%) eyes and optic atrophy in 16 (44.4%) eyes at the last visit. There were CME sequelae in 7 (19.4%) eyes and epiretinal membrane in 8 (22.2%) eyes (some eyes had multiple findings). Similarly, two of 3 eyes with serpiginous choroidopathy had a pre-existing macular scar.

Preoperative complications secondary to uveitis were posterior synechiae in 28 (25.6%) eyes, sequalae of retinal vasculitis in 16 (14.6%) eyes, increased IOP in 16 (14.6%) eyes, sequelae of CME in 13 (11.9%) eyes, band keratopathy in 4 (3.6%) eyes, ERM in 4 (3.6%) eyes, and corneal opacification in 1 (0.9%) eye.

Prior to surgery, 16 (14.6%) eyes were receiving topical anti-glaucomatous medication for uveitic glaucoma. In this group, 6 (37.5%) eyes had FUS, 4 (25%) eyes had Behcet's disease, 3 (18.7%) eyes had idiopathic uveitis, 2 (12.5%) eyes had viral uveitis and 1 (6.3%) eye had Vogt-Koyanagi-Harada disease.

During the follow-up period, posterior capsule opacification was the most common complication and occurred in 48 (44.0%) eyes, of which 44 (40.3%) required Nd:YAG capsulotomy. The time of PCO development ranged from 4 to 45 months (median 5 months). PCO was most commonly seen in eyes with a diagnosis of FUS (17 eyes, 35.4%). An epiretinal membrane developed in 4 (3.6%) eyes at 7 to 63 months (median 16 months). Nineteen (17.4%) eyes developed giant cell deposits on the anterior surface of the IOL and 8 (7.3%) eyes required Nd:YAG laser to remove the deposits. These deposits were most commonly seen in eyes with FUS with 9 (42.1%) eyes. Development of deposits ranged from 1 to 26 months (median 5 months). Two (1.8%) eyes developed new posterior synechiae after the surgery. None of the eyes had IOL decentralization or capture during follow-up, and we did not need to remove the IOL. Five (4.5%) eyes with no evidence of preoperative CME developed the condition postoperatively. Among these eyes, 4 (75%) were treated by intravitreal 40 mg triamcinolone injection, and the remaining 1 (25%) eye with a periocular injection. The time of CME development ranged from 1 to 7 months (median 1 month).

During the follow-up, IOP increased in 7 (6.4%) eyes. Two (28.5%) of these eyes had been injected intracameral steroids, while the remaining 5 (71.4%) eyes had not. Of these 7 eyes, 2 (28.5%) eyes had idiopathic uveitis, 2 (28.5%) Behcet's disease, 1 (14.2%) virus-associated uveitis, 1 (14.2%) juvenile idiopathic arthritis, and 1 (14.2%) FUS and ankylosing spondylitis (AS). The pressure in two of these eyes could not be controlled with medical treatment so one with a diagnosis of Behcet underwent Ahmed glaucoma valve implantation while the other one with a diagnosis of FUS underwent trabeculectomy with mitomycin-C (MMC). Another 2 eyes that had Behcet disease

and idiopathic uveitis and where the glaucoma in the preoperative period could not be controlled with medical treatment in the follow-up period following cataract surgery underwent trabeculectomy with MMC. Preoperative and postoperative complications are shown in Table 3.

Comparison of Group-1 and Group-2 revealed no difference in the number of attacks within the first 6 months (chi-square test, p= 0.267). There was again no statistically significant difference between the groups regarding postoperative complications (chi-square test, PCO p=1.000 for ERM, CME, posterior synechiae and glaucoma p=0.579 for deposits on IOL). The quiet period before surgery and the anatomical distribution of uveitis, two factors that may influence the appearance of an attack, did not show a statistically significant difference between the two groups (chi-square test, p>0.05). The differences between the two groups are summarized in Table 4.

Recurrence of uveitis occurred in 15 (8.2%) eyes within 6 months of cataract surgery. These eyes included 9 with (60%) Behcet's disease, 3 (20%) idiopathic uveitis, 2 (13.3%) multiple sclerosis, and 1 (6.6%) FUS and ankylosing spondylitis. All these eyes had a single attack within the first six months except one eye that suffered two attacks. The attack was in the form of panuveitis in 10 (66.6%), anterior uveitis in 2 (13.3%), posterior uveitis in 2 (13.3%) and intermediate uveitis in 1

TABLE 3: Preoperative and postoperative complications in patients with uveitis.

Complications	Preoperative, n of eyes (%)	Postoperative, n of eyes (%)
Glaucoma	16 (14.6%)	7 (6.4%)
Sequel of retinal vasculitis	16 (14.6%)	---
Cystoid macular edema	13 (11.9%)	5 (4.5%)
Epiretinal membrane	4 (3.6%)	4 (3.6%)
Band Keratopathy	4 (3.6%)	---
Corneal opacification	1 (0.9%)	---
Posterior capsule opacification	---	48 (44.0%)
Deposits on IOL	---	19 (17.4%)
Recurrence	---	15 (13.7%)

n: number, IOL: intraocular lens.

TABLE 4: Comparison of groups where triamcinolone was administered or not administered to the anterior chamber.

Parameters	Group-1	Group-2	p value
Age at surgery (year)	32.0±12.4 (7-55)	41.7±13.2 (13-68)	0.001*
The quiescence time (month)	9 (3-44)	11 (5-141)	0.325**
Recurrence (n)	4 (12.9%)	11 (14.1%)	0.267***
Preoperative complication (n)†	18 (58.0%)	44 (56.4%)	>0.05
Postoperative complication (n)†	14 (45.1%)	45 (57.6%)	>0.05
Anatomical distribution			
Anterior	11 (35.5%)	30 (38.5%)	
İntermediate	3 (9.7%)	8 (10.3%)	0.975***
Posterior	---	2 (2.6%)	
Panuveitis	17 (54.8%)	38 (48.7%)	

*independent t-test, ** : Mann-Whitney U test, ***: chi-square test † : multiple complications in one eye.

(6.6%). All the cases with an attack had received topical steroids and/or systemic steroid treatment or the systemic steroid dose had been increased in the week before surgery except for 2 eyes that did not receive perioperative treatment. The final visit BCVA was <20/400 in the 6 (40%) of the eyes with recurrence. Treatment of recurrent uveitis included intensive topical prednisolone acetate and oral methylprednisolone or periocular injection of triamcinolone. Intracameral triamcinolone injection had been performed during surgery in 4 (26.6%) of the eyes that suffered an attack. The characteristics of these cases have been presented in Table 5.

DISCUSSION

Cataract management in patients with a history of chronic uveitis remains a challenge for surgeons. Band keratopathy, poor pupil dilation, posterior synechiae, a rough anterior capsule, pupillary membrane formation, hemorrhage from iris neovascularization, a poor red reflex, and poor zonular support make cataract surgery more difficult than the surgery in healthy eyes.[9-13] Worsening or relapsing of intraocular inflammation after cataract surgery are also not uncommon and may result in unsatisfactory visual rehabilitation.[14-16] The broader use of perioperative anti-inflammatory drugs and systemic immunosuppressive therapy, and new designs and relevant biocompatibility of the IOL materials have currently made phacoemulsification cataract extraction and IOL implantation the standard approach.

In concordance to other studies, we found that phacoemulsification in patients with chronic or recurrent uveitis led to a significant improvement in BCVA ($p<0.001$).[3,5,17] Previous studies have re-

TABLE 5: Characteristics and the features of each eye that relapsed within the six months after phacoemulsification and intraocular lens implantation.

Eye	Age *	Gender	Etiology	The quiescence time	Systemic medication	Perioperative management	Complications	attacks (n)	intracameral steroid	BCVA**
1	18	M	Fuchs+AS	14 months		SS and TS admitted	Glaucoma	1	yes	20/100
2	40	M	Behcet	4 months	SS, immunosuppresive	SS increased, TS admitted	ERM	1	no	< 20/400
3	39	M	Behcet	5 months	Immunosuppressive	SS and TS admitted	PCO	1	no	20/25
4	41	M	Behcet	3 months	SS, immunosuppresive	SS increased, TS admitted	ERM	1	no	< 20/40
5	68	F	Idiopathic	7 months	----	TS admitted	CME	1	no	< 20/400
6	46	M	Behcet	4 months	Immunosuppressive	SS and TS admitted	PCO CME	1	yes	< 20/400
7	35	M	Behcet	11 months	SS, immunosuppressive	TS admitted	--	1	no	< 20/400
8	45	F	MS	12 months	Immunosuppressive	SS and TS admitted deposits on IOL	PCO	1	no	20/20
9	45	F	MS	13 months	Immunosuppressive	SS and TS admitted deposits on IOL	PCO	1	no	20/20
10	23	F	Behcet	6 months	Immunosuppressive	TS admitted	PCO	1	no	20/70
11	42	F	Idiopathic	3 months	SS, immunosuppressive	SS increased, TS admitted	Glaucoma PCO	1	no	20/30
12	26	M	Behcet	15 months	Immunosuppressive	SS and TS admitted	--	1	yes	20/200
13	19	M	Behcet	3 months	Immunosuppressive	SS and TS admitted	PCO	2	yes	20/25
14	3	M	Behcet	15 months	Immunosuppressive	TS admitted	PCO	1	no	< 20/400
15	11	M	Idiopathic	3 months	SS, immunosuppressive	SS and TS admitted	CME	1	no	20/25

Age *: Age at cataract surgery, BCVA **: Best corrected visual acuity at last visit with a Snellen chart, M: male, F: Female, AS: Ankylosing spondylitis, SS: systemic steroid, TS:topical steroid, ERM: epiretinal membrane, PCO :posterior capsule opacification, CME: cystoid macular edema, IOL: intraocular lens.

ported short and long-term visual improvement of ≥ 2 lines in up to 93% of patients.[18-21] In our study, 72.4% of the eyes showed ≥ 2 Snellen lines of visual improvement at the final visit. Fuchs uveitis syndrome was associated with the best visual outcomes in our series. This result is also consistent with a-meta-analysis that found that 92% of eyes where the uveitis was quiet achieved 20/40 or better visual function following cataract surgery.[22] In all, the final visual acuity was ≥ 20/25 in 25 eyes diagnosed with FUS and 20/20 in 16 (64%) eyes. On the other hand, some studies have reported substantial problems such as glaucoma or uveitis.[23] Similarly, glaucoma developed preoperatively in 6 and postoperatively in 1 FUS eye in our series. Patients with Behcet's disease have worse visual outcomes than the cases with other clinical etiologies in several studies, similar to our findings.[5,10,24] The most common diagnosis in our cases was Behcet's disease. We believe the poor visual results are associated with the accompanying posterior segment findings and corneal scar development. We also found poor visual outcomes in patients with serpiginous choroidopathy and a pre-existing macular scar had been detected in these eyes. Kawaguchi et al. reported that Behcet's disease patients had worse visual acuity than patients with other etiologies such as idiopathic uveitis, sarcoidosis or Vogt-Koyanagi-Harada disease.[5] Yoeruek et al. analyzed the risk factors for poor visual outcomes and found that preoperatively existing macular lesions were associated with poor BCVA.[17]

The most common complication during the follow-up period was PCO (44.0%). This rate has been reported as 23.7% by Kawaguchi et al. 31% by Estafounus et al. and 96% by Rahman et al. Hydrophilic acrylic intraocular lenses worked well in eyes with higher uveal biocompatibility, but PCO development was greater than in eyes with hydrophobic acrylic IOLs.[5,20,25,26] It is known that PCO development is seen least commonly with hydrophobic IOLs and with sharp optic edges.[26-29] A hydrophobic acrylic lens had been used in all our patients. We believe different rates of PCO, when compared with the literature is due to the difference in follow-up time and the IOL material placed into the eye. We saw PCO most commonly in FUS cases in this study. We believe that the presence of a chronic low-grade inflammation in FUS contributed to PCO development.

Attacks were found in 15 (13.7%) eyes in the first 6 postoperative months. The outcome was poor in 40.0% of these eyes and at least one postoperative complication was present in 86.6%. Attacks were most common in Behcet's patients in our study. Similarly, Kawaguchi et al.[5] reported at least 1 attack in 13.0% of the cases within the first 6 months, while Behcet's patients were the group with the most common attack rate of 35.7%.

The use of intracameral triamcinolone in uveitic cataract surgery is safe and can significantly control postoperative inflammation during the first weeks after cataract surgery.[30,31] We were unable to evaluate the effect of triamcinolone on early inflammation due to the retrospective nature of our study. However, we did not find any difference following anterior chamber triamcinolone injection regarding the frequency of attacks and postoperative complications in the first six months, when we compared the two groups that also showed no difference regarding anatomical distribution and attack-free duration. Li et al. compared intracameral triamcinolone acetonide with intraoperative intravenous methylprednisolone and postoperative oral prednisolone in patients with juvenile idiopathic arthritis.[31] Hypotony, CME or fibrin formation cases developed in the other 2 groups, but none of the patients who received intracameral triamcinolone acetonide had fibrin formation or hypotony in the 10-month postoperative follow-up period. This indicates that different postoperative results may be obtained with different uveitis subtypes. Gupta et al. evaluated the effect of an intravitreal dexamethasone implant in uveitis patients during cataract surgery and compared the results with patients who had received oral steroids.[32] They reported that not only the anterior chamber inflammation decreased progressively in a similar pattern in both groups, but there was also no difference regarding the recurrence of uveitis at 1-year follow-up. Despite similar studies in the literature, we believe our study will provide guid-

ance as regards creating a national database, considering the etiological variety of the uveitis cases.[3,5,17-21] We believe further studies comparing groups with various uveitis subtypes and evaluating postoperative inflammation preferably with a laser flare meter are necessary.

In conclusion, the current study has shown that the results of phacoemulsification cataract extraction with IOL implantation in patients with uveitis are satisfactory. However, patients with Behcet's disease have a higher risk of relapse of intraocular inflammation and worse outcomes. Preoperative and postoperative tight control of inflammation and frequent follow-ups are therefore especially important in this patient group.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Author Contributions

Idea/Concept: *Faruk Öztürk, Pınar Özdal;* ***Design:*** *Faruk Öztürk, Pınar Nalçacıoğlu, Pınar Özdal;* ***Control/Supervision:*** *Pınar Özdal, Faruk Öztürk;* ***Data collection and/or Processing:*** *Pınar Nalçacıoğlu, Pınar Özdal, Mustafa Türkyılmaz;* ***Analysis and/or Interpretation:*** *Faruk Öztürk, Pınar Nalçacıoğlu, Pınar Özdal;* ***Literature Review:*** *Pınar Nalçacıoğlu;* ***Writing the Article:*** *Faruk Öztürk, Pınar Nalçacıoğlu, Pınar Özdal;* ***Critical Review:*** *Pınar Özdal, Faruk Öztürk.*

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