Original Article

Long-term outcomes of small-incision cataract surgery in patients with uveitis

Rahul Bhargava, Kankambari Pandey[1], Bhavya Mehta

Purpose: To evaluate the long-term outcomes of manual small-incision cataract surgery (MSICS) in eyes with uveitis. **Methods:** Patients who underwent MSICS for uveitic cataract from 2009 to 2019 were retrospectively evaluated. Visually significant cataract and presence of less than five cells per high-power field in the anterior chamber for a minimum of 3 months were the prerequisites for surgery. Patients with follow-up less than 9 months were excluded. **Results:** After exclusion, 283 eyes of 264 patients were evaluated. The mean age of patients was 44.3 ± 11.3 years. The mean follow-up duration was 22 ± 11.5 months. The mean surgical time was 11.2 ± 3.2 min. One hundred and seventy-two eyes (60.8%) had anterior uveitis, 78 (27.5%) had posterior uveitis, and 33 (11.7%) had panuveitis. At the final follow-up, 253 eyes (88.4%) had corrected distance visual acuity (CDVA) better than 0.6 log of minimum angle of resolution (LogMAR) unit. The final endothelial cell counts were significantly (analysis of variance [ANOVA], $P = 0.001$) lower in eyes with human leukocyte antigen (HLA)-B27–associated uveitis and in eyes with idiopathic anterior uveitis. Patients on systemic corticosteroids had significantly better ($P = 0.031$) final visual acuity than those without preoperative corticosteroids. Recurrent uveitis (43.8%), Posterior capsule opacification (PCO) (19.4%), glaucoma (8.5%), cystoid macular edema (CME; 13.5%), and Epiretinal membrane (ERM) (5.6%) were the frequent complications. A significantly worse (ANOVA, $P = 0.001$) visual prognosis was seen in patients with Vogt–Koyanagi–Harada disease (VKH), sarcoidosis, acute posterior multifocal placoid pigment epitheliopathy (APMPPE), and serpiginous choroiditis. **Conclusion:** MSICS is safe in most cataracts due to uveitis and results in improvement in CDVA at 9 months. Posterior capsule opacification, macular edema, persistent uveitis, etiology of uveitis, and use of preoperative steroids significantly influenced the visual outcome.

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In patients with uveitis, several unforeseen situations make cataract surgery more challenging compared to age-related cataract.[1] In uveitic cataract, band-shaped keratopathy and corneal deposits may decrease visibility during surgery; poor pupillary dilatation, bleeding from fragile vessels, pupillary membranes, or presence of synechia pose additional challenges to the surgeon. Secondly, each case of uveitic cataract may be different and may respond differently to surgery. Therefore, it is not possible to label any surgical procedure as the optimal technique. Lastly, in cases with extensive posterior synechia and extremely dense nuclei, it may be prudent to enlarge the incision to facilitate manual nucleus extraction.[2]

Cataract surgery in patients with uveitis calls for proper patient selection, counseling, and preoperative control of inflammation to optimize the postoperative outcome. Secondly, early management of postoperative complications like intraocular inflammation, glaucoma, and macular edema is of paramount importance for long-term visual gain.[3]

The lack of consensus on the optimal surgical procedures and use of perioperative steroids for different etiologies of uveitis has led to the exploration of manual small-incision cataract surgery (MSICS) as a viable alternative to phacoemulsification in developing countries.[4] In settings with high surgical volume or rural areas with limited access to phacoemulsification, MSICS was found to be significantly faster, requiring minimal instrumentation, and had the ease of being performed in all settings. In a study done at a teaching hospital in the subcontinent, it was observed that about 16–18 cases/hour of MSICS could be safely performed with a surgical time of 3.75 min/case by high-volume surgeons.[5]

Several studies in the subcontinent have observed that MSICS with posterior chamber intraocular lens (PCIOL) implantation is safe in most cataracts due to uveitis and improves the corrected distance visual acuity (CDVA) at 6 months if inflammation has been adequately controlled preoperatively. However, these studies had limitations due to a small sample size and relatively smaller follow-up duration.[6,7]

The present study retrospectively evaluated the long-term outcomes of MSICS with PCIOL implantation in patients with different etiologies of uveitis and attempted to identify the risk factors for postoperative complications.

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Methods

In this study, hospital records of 280 eyes of 264 patients who had MSICS with PCIOL implantation (in the bag) for uveitic cataract from 2009 to 2019 were retrospectively evaluated.

Inclusion criteria

All patients who had visually significant uveitic cataract (visually significant cataract was defined as best-corrected visual acuity (BCVA) of worse than 20/40 in the cataractous eye) and eyes with lenticular opacities hampering adequate visualization of posterior segment were evaluated in this study. The prerequisite for cataract surgery in these patients was "a quiet eye," defined as five or less than five cells per high-power field in the anterior chamber for a minimum period of 3 months; however, patients with mild vitritis were included, as cells may persist even in inactive stage and cannot be eliminated.[8]

Exclusion criteria

Patients who had a postoperative follow-up of less than 9 months, had preexisting retinal pathologies like cystoid macular edema (CME), traumatic and subluxated cataracts, diabetes mellitus, and preoperative endothelial cell counts (ECCs) less than 2000 cells/mm^2 did not participate in the study.

Preoperative workup

All patients with uveitic cataract went through a routine preoperative workup, which included total and differential leukocyte counts, erythrocyte sedimentation rate and blood sugar levels, Mantoux test, chest X-ray, and X-rays of the cervical spine and sacroiliac joints. Second-line investigations were done as and when needed that included rheumatoid factor, angiotensin converting enzyme essay, anti-nuclear factor, human leukocyte antigen typing, and enzyme-linked immunosorbent assay for Toxoplasma gondii; rubella virus; cytomegalovirus; and herpes simplex viruses (TORCH) infections, human immunodeficiency virus, and tuberculosis. In cases where funduscopy was not possible due to dense cataract, B-scan ultrasonography was performed. Intraocular pressure was measured with applanation tonometry. ECCs (cells/mm^2), variation in size of endothelial cells (coefficient of variation [CV]) and cells' coefficient of variation, and central corneal thic kness (CCT) measurements were done with EM-3000 specular microscope (Tomey, Nagoya, Aichi, Japan).

Uveitis was classified and aqueous flare and cells were graded based on the Standardization of Uveitis Nomenclature (SUN) criteria.[9]

All patients had a thorough workup, and the data collection included recording of gender, age at surgery, preoperative findings such as uncorrected distance visual acuity (UDVA), CDVA, etiology of uveitis (whenever known), anatomical location of uveitis, corticosteroid intake, frequency and duration of quiescence of inflammation before surgery, ECCs, surgical time and duration of follow-up, and presence of complications.

Preoperative corticosteroids

Preoperatively, oral prednisolone, 1 mg/kg body weight, was given 7 days before surgery, continued postoperatively, and tapered according to the inflammatory response over 4–6 weeks; patients receiving preoperative steroids were the ones with previously documented macular edema, recurrent uveitis, chronic anterior uveitis, and intermediate uveitis.

Surgical technique

Peribulbar anesthesia was delivered. The surgical area was painted and draped, and the lids separated using a wire speculum. A bridal suture was then passed beneath the superior rectus. A fornix-based conjunctival flap was made superiorly and bleeders cauterized with wet field cautery. For MSICS, a side port entry was made at the 10 O' clock position with a 20-G micro vitreo-retinal surgery (MVR) or a 15° angled knife. A 5.5–6 mm superior incision was made on the sclera, 1.5 mm posterior to the limbus. A self-sealing (triplanar) sclerocorneal tunnel was made with a 2.2-mm bevel up crescent knife with adequate side pockets. The anterior chamber (AC) was formed with 2% hydroxypropyl methylcellulose. AC entry was made and enlarged with a 2.8-mm keratome. In nondilating pupils, synechiolysis and membrane peeling were done and iris hooks were used as and when required. Adjunctive trypan blue-assisted continuous curvilinear capsulorrhexis (CCC) was created, followed by hydrodissection with a 2-ml syringe attached to a 25-G cannula. The nucleus was rotated in the bag with a bent capsulotomy needle and prolapsed into the AC. The ophthalmic viscosurgical device (OVD) was again injected above and below the nucleus to protect the endothelium. The nucleus was then delivered by the sandwich technique. Lens matter aspiration was performed with a Simcoe cannula. Implantation of a hydrophobic acrylic lens (AcrySof IQ, Alcon) in the capsular bag was aimed in all cases. The self-sealing wound was left unsutured.[10]

Postoperative care and follow-up

Routine postoperative care included topical moxifloxacin 0.5% eyedrops six times a day, 1.0% atropine eyedrops three times a day, and 0.1% topical betamethasone eyedrops hourly that was tapered over 10–12 weeks. Topical ketorolac tromethamine 0.4% eyedrops was used selectively, three times a day, in patients who developed CME; these patients also received topical corticosteroids. Patients were followed up on the first, third, and seventh postoperative days, then weekly for 2 weeks, monthly for 2 months, and every 3 months for 1 year and every 6 months thereafter. At each visit, stereoscopic fundus examination with a +90 D lens and recording of UDVA/CDVA, aqueous cells, and flare were done. ECCs were measured at 1 week, and thereafter at 3 and 6 months. Posterior segment optical coherence tomography (OCT) was done in all patients at 1 month and repeated at 3 months. In patients taking preoperative systemic corticosteroids, their doses were tapered over 4–6 weeks, depending on the response, and they underwent monitoring of blood sugar, blood pressure, and urine analysis.

Outcome measures

The primary outcome measure was an improvement in visual acuity (VA) postoperatively. Secondary outcome measures were postoperative astigmatism, changes in ECC, and rate of postoperative complications. Surgically induced astigmatism (SIA) was calculated using the rectangular coordinate method.

Statistical analysis

Statistical analysis was performed using the IBM statistical software, Statistical Package for the Social Sciences (SPSS)

version 28 (IBM Inc.). For patients who underwent bilateral cataract surgery, one eye was randomly selected for data collection and analysis. Normally distributed data was expressed as mean ± standard deviation (SD). One-way analysis of variance (ANOVA) was used when more than two groups were compared. Repeated measure ANOVA was used to compare changes in preoperative vision over time. Association between two categorical variables was evaluated using Chi-square tests. Means of groups were compared using *t*-tests. The 95% confidence interval (CI) values were calculated for each mean. To lower the risk of type I errors, the statistical significance level was set at $P < 0.05$.

Results

Patient characteristics

In this analysis, 34 cases were excluded from the study due to follow-up being less than 9 months. In addition, 20 patients were lost to follow-up. After exclusion, records of 283 eyes which underwent cataract surgery for uveitic cataract between 2009 and 2019 were retrospectively analyzed. The mean age of patients at cataract surgery was 44.3 ± 11.3 years. The mean follow-up duration was 22 ± 11.5 (range 9–60) months. There were 135 males, with a male to female ratio of 0.9:1. The mean age of females (46 ± 10.9 years) was significantly higher compared to that of males (independent *t*-test, $P = 0.006$). Table 1 shows the baseline characteristics of patients.

Etiology of uveitis and anatomical location

Out of 283 eyes, 172 (60.8%) had anterior, 78 (27.5%) had posterior, and 33 (11.7%) had panuveitis. Diagnosis could not be established with certainty in 94 (33.2%) eyes, and they were labeled as idiopathic anterior uveitis. In the study sample, a higher prevalence of Vogt–Koyanagi–Harada disease (VKH; 38 eyes, 13.4%), Fuchs' heterochromic cyclitis (FHC; 37 eyes, 13.1%), and sarcoidosis (39 eyes, 13.8%) was observed [Table 2].

Etiology of uveitis and visual outcome

Snellen VA was converted to log of minimum angle of resolution (LogMAR) units for comparisons. The mean preoperative VA was worse than 1 LogMAR unit in 141 eyes (49.8%) and between 0.8 and 1 LogMAR unit in 142 eyes (50.2%). At the final visit, the vision was better than 0.3 LogMAR unit in 162 eyes (57.2%) and 0.2 LogMAR unit in 79 eyes (35.3%). Fig. 1 shows the VA outcomes according to the etiology of uveitis. The final VA was significantly worse (ANOVA, $P < 0.001$) in eyes with VKH, sarcoidosis, acute posterior multifocal placoid pigment epitheliopathy (APMPPE), and serpiginous choroiditis. On *post hoc* analysis, it was found that the VA of eyes with Fuch's heterochromic iridocyclitis (FHIC) was comparable to that of eyes with idiopathic anterior uveitis ($P = 0.242$), rheumatoid arthritis ($P = 0.945$), and human leukocyte antigen (HLA)-B27–related uveitis ($P = 0.184$).

Etiology of uveitis and ECC

Preoperatively, the ECCs were comparable between the different etiologies of uveitis (ANOVA, $P = 0.078$). At the first postoperative visit and the final visit, there was a significant reduction (ANOVA, $P = 0.001$ and <0.001, respectively) in ECCs between the different etiologies of uveitis. The final ECCs were significantly lower (ANOVA, $P = 0.001$) in eyes with HLA-B27–associated uveitis and idiopathic anterior uveitis, respectively. On *post hoc* analysis, the final ECCs did not significantly differ between eyes with sarcoidosis, VKH, serpiginous choroiditis, and APMPPE uveitis ($P = 0.393$, 0.998, 0.989, and 0.978, respectively). Fig. 2 shows endothelial cell changes according to the etiology of uveitis. The final ECC was significantly lower in the group in which pupil-expanding procedures were performed or in cases with posterior capsular rent with vitreous loss ($n = 20$). The mean final ECC at 9 months in the group with pupil dilation procedures and/or vitrectomy ($n = 120$ and 20, respectively) was (2190 ± 20.5 cells/mm^2) compared to 2380 ± 30.3 cells/mm^2 in the group without additional procedures ($P < 0.001$).

Preoperative corticosteroids and inflammation

Preoperatively, 85 eyes (30%) received systemic corticosteroids. Additionally, 40 eyes (1.4%) received topical steroids. Eighty-two (28.9%) eyes had mild to moderate AC reaction on the first postoperative day. At the end of the first postoperative month, 42 eyes (14.8%) had 2 + AC cells. In these eyes, topical steroids were continued for 8 weeks and resulted in resolution of inflammation. However, 122 (43.8%) eyes had at least one recurrent episode of uveitis during the follow-up period. Twenty-eight eyes with recurrent episodes of uveitis had persistent vitreous haze at the final follow-up examination.

Patients on systemic corticosteroids (patients with previously documented macular edema, recurrent uveitis, chronic anterior uveitis, and intermediate uveitis) had significantly better (independent *t*-test, $P = 0.031$) final VA than the patients who did not use preoperative corticosteroids (0.28 ± 0.14 vs. 0.34 ± 0.18 LogMAR units, respectively).

Table 1: Patient characteristics

Variable	Value
Age (years, Mean±SD)	44.3±11.3
Gender (*n*, %)	
Female	135 (47.7)
Male	148 (52.3)
Mean preoperative vision (LogMAR)	1.1±0.14
Follow-up duration (months, Mean±SD)	22±11.5
Surgically induced astigmatism (D)	1.18±0.32
Surgical time (min)	11.2±3.2

LogMAR=log of minimum angle of resolution, SD=standard deviation

Table 2: Etiology of uveitis and anatomical location

Etiology	Anterior	Posterior	Panuveitis	Total
Idiopathic (*n*, %)	94 (33.2)	-	-	94 (33.2)
FHC	37 (13.1)	-	-	37 (132.1)
VKH	-	38 (13.4)	-	38 (13.4)
HLA-B27	16 (5.7)	-	-	16 (5.7)
Sarcoidosis	-	6 (2.3)	33 (11.7)	39 (13.8)
RA	25 (8.8)	-	-	25 (8.8)
Serpiginous choroiditis	-	25 (8.8)	-	25 (8.8)
APMPPE	-	9 (3.2)	-	9 (3.2)
Total	172 (60.8)	78 (27.5)	33 (11.7)	283 (100)

APMPPE=acute posterior multifocal placoid pigment epitheliopathy, FHC=Fuchs' heterochromic cyclitis, HLA=human leukocyte antigen, RA=rheumatoid arthritis, VKH=Vogt–Koyanagi–Harada disease

Postoperative complications

Table 3 shows the postoperative complications according to the etiology of uveitis. These include posterior capsule opacification, glaucoma, CME, ERM, corneal edema, posterior kerratic precipitates (KP's), and pigment deposits on the IOL surface.

On the first postoperative day, corneal edema was observed in 28 eyes (9.9%). The mean endothelial cell loss in these patients was 25.4% at 1 week and 28.6% at 6 months. We observed 14 cases (4.9%) of new-onset postoperative glaucoma, and 46 (16.2%) patients had medically controlled glaucoma before surgery.

Elevated IOP was seen in 39 (13.8%) eyes at a mean postoperative duration of 1.18 ± 0.4 months. In 24 (8.5%) eyes, a sustained rise in IOP was seen, despite maximum tolerated topical therapy with two drugs. These patients were referred to the glaucoma clinic for further management. Trabeculectomy was performed in 12 eyes (4.2%), and four eyes (1.4%) had Ahmed glaucoma valve done. The CDVA remained less than 1 LogMAR in eyes with recurrent uveitis ($P = 0.001$), vitreous opacities ($P = 0.045$), healed posterior KPs ($P = 0.006$), and CME ($P = 0.001$).

Secondary procedures

Neodymium yttrium aluminium garnet (Nd: YAG) laser capsulotomy was done in 45 (15.9%) eyes after a quiet postoperative period of 3 months. Twelve (4.2%) patients were referred to the retina clinic for epiretinal membrane peeling. Glaucoma filtering surgery was done in 16 (5.7%) eyes. Four eyes had Ahmed glaucoma valve implantation.

Discussion

In most countries and settings, phacoemulsification is now the preferred technique of cataract surgery for age-related cataract. However, different uveitic syndromes may respond differently to surgery, making the outcomes of cataract surgery difficult to assess in uveitic eyes.

In our experience, phacoemulsification may not always be successful in fragmenting extremely dense nuclei with extensive posterior synechia; therefore, we routinely suggest scleral tunnel incisions even for phacoemulsification of uveitic cataracts. It may often be necessary to enlarge the incision to facilitate manual nuclear extraction. High surgical volume in the subcontinent calls for a technique which is not only quicker, but also could be performed in all setups. A study done in the Indian subcontinent found that SICS was a significantly ($P < 0.001$) faster surgical technique than phacoemulsification (10.8 ± 2.9 vs. 13.2 ± 2.6 min) when both were compared in patients with uveitic cataract.[10]

In our study, there was a significant improvement in BCVA between the first and last visits ($P < 0.001$). Previously conducted studies in the subcontinent have documented strict control of preoperative inflammation to be the only crucial

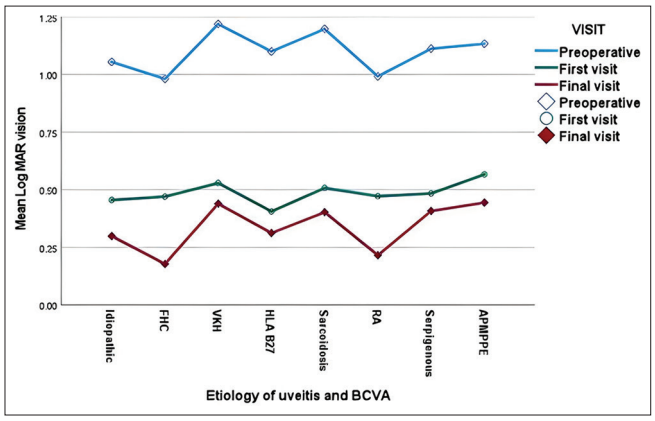

Figure 1: A line diagram showing mean LogMAR visual acuity in different etiologies of uveitis preoperatively, on the first postoperative day, and at the final follow-up examination

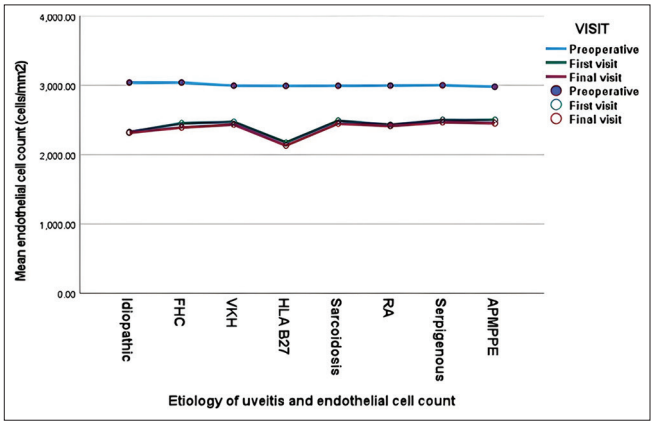

Figure 2: A line diagram showing mean endothelial cell counts (cells/mm^2) in different etiologies of uveitis preoperatively, on the first postoperative day, and at the final follow-up examination

Table 3: Postoperative complications and etiology of uveitis

Etiology	PCO	Glaucoma	CME	ERM	Recurrent uveitis	Posterior KPs
Idiopathic (*n*, %)	18 (6.4)	6 (2.1)	8 (2.8)	2 (0.7)	24 (8.5)	0
FHC	12 (4.2)	14 (4.9)	2 (0.7)	0	18 (6.4)	2 (0.7)
VKH	2 (0.7)	2 (0.7)	12 (4.2)	6 (2.1)	6 (2.1)	0
HLA-B27	12 (4.2)	6 (2.1)	4 (1.4)	0	18 (6.4)	0
Sarcoidosis	2 (0.7)	4 (1.4)	8 (2.8)	4 (1.4)	18 (6.4)	1 (0.3)
RA	5 (1.8)	3 (1)	0	0	16 (5.6)	0
Serpiginous choroiditis	2 (0.7)	4 (1.4)	3 (1)	2 (0.7)	12 (4.2)	1 (0.3)
APMPPE	2 (0.7)	0	1 (0.3)	2 (0.7)	14 (4.9)	0

APMPPE=acute posterior multifocal placoid pigment epitheliopathy, CME=cystoid macular edema, FHC=Fuchs' heterochromic cyclitis, HLA=human leukocyte antigen, RA=rheumatoid arthritis, VKH=Vogt–Koyanagi–Harada disease

determinant for improved visual outcomes following SICS in patients with uveitis.[6] Although the results of the present study are consistent with this observation, we observed that other factors like the etiology of uveitis, particularly, ankylosing spondylitis, sarcoidosis, and VKH, significantly (ANOVA, $P = 0.001$) affected the visual outcome [Fig. 1]. Secondly, use of preoperative steroids ($P = 0.005$) had significantly better visual outcome. In the study by Bhargava *et al*.,[7] however, visual outcome was not significantly influenced by the etiological type of uveitis (ANOVA, $P = 0.062$). This difference could be attributable to a longer follow-up duration (22 ± 11.5 months) in a relatively larger sample size ($n = 283$ vs. 64) of patients in the present study.[11]

At the end of our follow-up period (22.2 ± 11.5 months), the CDVA was 0.3 LogMAR or better in 162 (57.2%) eyes, and 253 eyes (88.4%) had CDVA better than 0.6 LogMAR unit. However, 30 eyes (10.6%) had CDVA worse than 1 LogMAR unit. Ozates *et al*.[12] found that 61.3% patients achieved a CDVA better than 0.3 LogMAR unit after phacoemulsification for uveitic cataract. An improvement in CDVA better than 0.6 LogMAR unit was observed in 92.6% cases by Bhargava *et al*. for SICS in uveitic cataract.

CME (13.4%) was a common cause of decreased vision post-operatively. Severe uveitis was associated with an increased incidence of macular edema. There was a significant ($P < 0.001$) reduction in the rate of macular edema [Fig. 3] in patients treated with oral corticosteroids, preoperatively. Thus, it appears that the extent of the severity of inflammation was a preoperative risk factor for postoperative complications like CME.

Kitaguchi-Iwakiri *et al*.[13] found that the cumulative long-term incidence of PCO in uveitis patients with implantation of Acrysof IQ monofocal (SN60WF) IOL was 16.2%. In the present study, the long-term incidence of PCO with hydrophobic acrylic IOL was 19.4% (n = 55). In another study, Bhargava *et al*.[14] observed that the incidence of PCO with implantation of PMMA IOL following SICS was 16.7%. Although the incidence of PCO in our study was comparable to other studies, it appears that factors other than IOL biomaterial, optic-haptic design, and IOL placement influence PCO incidence in uveitis. In our study, we observed that most patients (n = 37) with PCO had increased inflammation in the postoperative period (67.4%) and/or recurrent uveitis (n = 20, 34.5%). It is probable that exaggerated/recurrent postoperative inflammation accelerates LEC proliferation and migration and enhance cytokines and chemokines flow into the eye and stimulate equatorial LECs for PCO formation.[15]

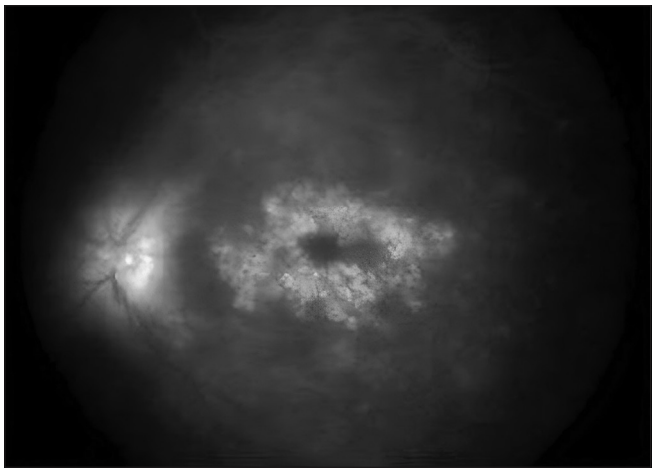

Figure 3: Cystoid macular edema in a patient with persistent uveitis after MSICS. MSICS = manual small-incision cataract surgery

The impact of uveitis *per se* on ECD and cataract surgery has not been extensively evaluated. A study by Alfawaz *et al*.[11] found that ECD was significantly lower in eyes with uveitis than in controls; ECD was also lower in uveitic eyes that had undergone cataract or glaucoma surgery ($P = 0.0004$). A Romanian study also substantiated these findings.[16] However, these studies had limitations of being cross sectional and not longitudinal.

A study comparing phacoemulsification and SICS for FHC found that the mean endothelial cell loss 6 months postoperatively was significantly higher as compared with age-related cataract (20.5% in the phacoemulsification group and 19.2% in the SICS group), respectively.[17]

In our study, the mean endothelial cell loss at 9 months postoperatively was 16.2%. Patients with ankylosing spondylitis had a significantly higher (ANOVA, $P = 0.023$) endothelial cell loss [Fig. 2]. Extensive posterior synechia in these eyes necessitated anterior chamber instrumentation and manoeuvring for synechiolysis and pupillary membrane peeling and consequently higher endothelial cell loss. Thus, it appears that additional procedures required in uveitic cataract like use of iris hooks, synechiolysis and pupillary membrane peeling and/or vitrectomy leads to a higher endothelial cell loss. A study by Bhargava *et al*. found that endothelial cell loss was 19.2% at 6 months postoperatively in patients who had SICS for uveitic cataract; anterior chamber instrumentation and additional maneuvering time during these procedures were the probable factors for increased endothelial cell loss.[17] Although endothelial cell loss could be minimized by use of dispersive or viscoadaptive OVDs, cost considerations forbade us from doing so in all patients. We do, however, recommend use of OVDs in uveitis patients with ECCs less than 2000 cells/mm^2.

In our study, at least one recurrence episode was observed in 122 eyes (43.8%) during 22 ± 11.2 months of follow-up. In patients with Fuchs' heterochromic cyclitis, there was recurrence in 18 (6.4%) eyes. Bhargava *et al*.[7] reported recurrence in four eyes (6.3%) when small-incision cataract surgery was performed in patients with FHC during 12 months of follow-up. Another study by Bhargava *et al*.[6] found recurrent uveitis in 11 eyes (5.9%) when SICS was performed for uveitic cataract.

It has been reported that 10%–46% of uveitic patients develop raised IOP.[18] Patients with previously documented glaucoma and rise in postoperative IOP in patients with uveitis have been associated with poor visual outcomes.[17] In our study, 24 (8.5%) eyes developed sustained rise in IOP despite maximum-tolerated topical therapy with two antiglaucoma drugs. Out of these, 12 (4.2%) had previously documented medically controlled glaucoma. In a study comparing SICS with phacoemulsification for uveitic cataract, Bhargava *et al*. found secondary glaucoma in 5% and 6% eyes, respectively.[10] In another study in patients with FHC, Bhargava *et al*.[7] found that 4.8% eyes with medically controlled glaucoma developed a

sustained rise of the IOP despite a maximum-tolerated topical therapy. Out of these, one eye (1.6%) had an Ahmed glaucoma valve done. Thus, it appears that history of glaucoma in uveitis patients is a risk factor for postoperative rise in IOP.

The present study had several limitations. The retrospective review of clinical data was conducted at a single center, which was dependent on the quality of the information recorded. The enrolled patients reflected the epidemiology of uveitis in India. The characteristics of uveitis in India, such as smaller number of younger patients and those with posterior uveitis, might have affected the results, which could be a potential bias and should be addressed in the future.

Conclusion

In conclusion, MSICS with PCIOL implantation is a safe procedure in patients with uveitis and results in good visual outcome at 9 months. Patients with ankylosing spondylitis, sarcoidosis, and VKH had a significantly worse visual outcome. The use of preoperative corticosteroids was associated with a significantly better visual outcome. Recurrent uveitis and increased postoperative inflammation were the risk factors for CME and PCO development, whereas history of glaucoma was a risk factor for the postoperative rise in IOP. Endothelial cell loss was significantly higher in eyes that required additional surgical procedures.

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Conflicts of interest

There are no conflicts of interest.

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