Original Article

How Safe is Nd:YAG Laser Capsulotomy in Patients with Uveitis? Outcomes of a Long-Term Study

Mukesh Rajpoot[1], Harshraj Nehra[2], Vinod Sharma[3], Rahul Bhargava[4], Kanakambari Pandey[5], Bhavya Mehta[4], Gautam Kalra[4], P.L. Sireesha Reddy[4]

[1]Department of Ophthalmology, Government Medical College, Datia, Madhya Pradesh, India, [2]Department of Ophthalmology, Maharishi Markandeshwar Institute of Medical Sciences and Research, Ambala, Haryana, India, [3]Department of Ophthalmology, Indira Gandhi Medical College, Shimla, Himachal Pradesh, India, [4]Department of Ophthalmology, GS Medical College and Hospital, Pilkhuwa, Uttar Pradesh, India, [5]Department of Ophthalmology, Rama Medical College Hospital and Research Center, Pilkhuwa, Uttar Pradesh, India

Abstract

Purpose: To study the outcomes and complications of Nd:YAG laser capsulotomy in patients with uveitis.

Methods: This study retrospectively evaluated outcomes of Nd:YAG laser capsulotomy in 260 eyes of 260 patients with uveitis. The main indications for performing capsulotomy were a visually significant posterior capsule opacification (PCO) and inability to visualize the posterior segment. The presence of 5 or <5 cells per high-power field in the anterior chamber for a minimum period of 3 months was a prerequisite for capsulotomy.

Results: The mean age of patients was 52.8 ± 11.3 (range, 38–75 years). The incidence of PCO in the study was 22.4%. The mean follow-up was 21.5 ± 11.3 months postcapsulotomy. The mean best-corrected visual acuity (BCVA) improved in 161 (62%) eyes after capsulotomy. The BCVA remained stable in 50 (19.3%) eyes due to preexisting ocular pathology involving the macular area. There was worsening of BCVA in 49 (18.8%) eyes. The main causes of worsening of BCVA were sustained intraocular pressure (IOP) elevation (n = 13%), cystoid macular edema (CME) (n = 8.5%), and retinal detachment (RD) (n = 2.7%), respectively. Ninety-one percent (n = 20) of patients with CME had exaggerated postlaser inflammation and recurrent uveitis. The presence of posterior vitreous detachment (PVD) and higher laser energy levels were significant risk factors for RD.

Conclusions: Nd:YAG laser capsulotomy in patients with uveitis may be associated with complications. Inflammation and IOP should be well controlled before initiating laser capsulotomy. Capsulotomy should be performed with caution in patients with preexisting PVD.

Keywords: Cystoid macular edema, Nd:YAG laser capsulotomy, Posterior capsule opacification, Retinal detachment, Uveitis

Address for correspondence: Kanakambari Pandey, Department of Ophthalmology, Rama Medical College Hospital and Research Center, Hapur, Uttar Pradesh, India.
E-mail: editor.mrji@gmail.com
Submitted: 01-Oct-2023; **Revised:** 31-Dec-2023; **Accepted:** 31-Dec-2023; **Published:** 16-Oct-2024

Introduction

Advancements in cataract surgery technique, enhanced cortical clean up, better intraocular lens (IOL) designs, acrylic biomaterials, and IOL surface modification have all led to an appreciable reduction in the incidence of posterior capsule opacification (PCO) (to less than 10%).[1-3] Having said this, PCO remains the most common complication of cataract surgery and has important medical, social, and economic implications.[4,5]

Outcome of any invasive procedure in patients with uveitis may be significantly different from a procedure in eyes without uveitis; there may be exaggerated surgically induced inflammation which may potentially lead to posterior segment complications. Moreover, each case of uveitis is different and may respond differently to invasive or minimally invasive interventions.

Access this article online

Quick Response Code:

Website: https://journals.lww.com/joco

DOI: 10.4103/joco.joco_221_23

How to cite this article: Rajpoot M, Nehra H, Sharma V, Bhargava R, Pandey K, Mehta B, *et al*. How safe is Nd:YAG laser capsulotomy in patients with uveitis? Outcomes of a long-term study. J Curr Ophthalmol 2024;36:72-7.

The reported incidence of PCO in patients with uveitis is significantly higher; it ranges from 23% to 96%.[6] A study by Bhargava *et al*. (*n* = 283) reported that the incidence of PCO in uveitis was 19.6%.[7]

The main treatment modality for PCO is Nd:YAG laser capsulotomy. In myopic eyes, peeling and aspiration has been suggested as alternative to laser capsulotomy for pearl form of PCO.[8] It has been reported that about 2.9%–53.9% of patients with uveitis and PCO require laser capsulotomy.[9,10] Nd:YAG laser capsulotomy does influence the ability of a vitreoretinal surgeon to visualize the peripheral fundus in patients with retinal breaks; on the other hand, it may itself lead to retinal detachment (RD) and cystoid macular edema (CME).[8,11,12]

The impact of laser energy *per se* on flare up of inflammation and the rate of complications in patients with uveitis with different etiology has not been studied extensively. A search of major databases including PubMed did not reveal any study investigating these parameters. The present study evaluated visual outcome and complications following Nd:YAG laser capsulotomy in patients with uveitis in context of uveitis etiology, total laser energy used for capsulotomy, patients with history of CME, medically controlled glaucoma, and posterior vitreous detachment (PVD).

Methods

In this study, medical records of 260 uveitic eyes (260 patients) who had Nd:YAG laser capsulotomy from 2009 to 2021 were retrospectively evaluated. In patients who had bilateral laser capsulotomies, one eye was randomly selected for data collection and analysis.

The main indication for Nd:YAG laser capsulotomy was visually significant PCO (visually significant PCO was defined as one reducing best-corrected visual acuity (BCVA) by two or more Snellen lines) and eyes with PCO restricting adequate visualization of retina.[13] "A quiet eye", defined as 5 or <5 cells per high-power field in the anterior chamber for a minimum period of 3 months, was prerequisite for laser capsulotomy; nevertheless, individuals exhibiting mild vitritis were evaluated for capsulotomy, given that cells may endure even during the inactive phase of uveitis and are resistant to elimination.[14]

Patients who had a postcapsulotomy follow-up of <9 months, current CME, retinal pathologies like preexisting retinal breaks or RD, and diabetes were excluded from the study.

The preprocedural protocol included recording of corrected distance visual acuity (CDVA). After dilating the pupils with tropicamide 0.5% and phenylephrine 10% drops, fixation of IOL was noted in every case. The posterior pole was examined with a 90 diopter (D) lens while the peripheral retina was evaluated by binocular indirect ophthalmoscopy using a 20 diopter (D) lens with scleral indentation.

The intraocular pressure (IOP) of both eyes was measured before capsulotomy, on the day of the procedure (both before and 1 h after), and at specific intervals during the follow-up period. The two preoperative IOP measurements were averaged to report the baseline precapsulotomy pressure.

The following information was retrieved from medical records; demographic data, duration between cataract surgery and laser capsulotomy, surgical approach (phacoemulsification or manual small-incision cataract surgery), IOL fixation/biomaterial, laser energy used, anatomical type, and preexisting ocular pathology (uveitis etiology). To minimize selection bias, all the patient's records were evaluated by a single observer at each center.

Post Nd:YAG laser capsulotomy, the following data were recorded: BCVA, IOP, and postprocedural complications. Posterior segment was evaluated with optical coherence tomography.

None of the patients were on topical, periocular, or systemic steroids at time of laser capsulotomy. However, 20 (7.7%) patients were on topical antiglaucoma medications (with two drugs) and IOP was well controlled (<21 mmHg).

In this study, Q-switched Nd:YAG laser system (Visulas YAG II plus, Carl Zeiss, Germany), with wavelength of 1064 nm was used to create laser capsulotomy; it was fashioned with an Abraham lens using hydroxypropyl methylcellulose as coupling agent. One drop of proparacaine 0.5% was instilled into the conjunctival cul-de sac before the procedure. We aimed to create an opening of about 4 mm in size after dilating the pupil. An upward-downward direction imitating from a central cruciate incision was used with the aiming beam initially focused slightly posterior to the posterior capsule.[15] The surgeon endeavored to match the optical center of the IOL with the center of the opening. We recorded the starting energy (0.3–10 mJ), number of pulses, and total laser energy for each capsulotomy.

Assessment was conducted on the initial day following the procedure and subsequently at weekly intervals for the first 2 weeks. Following a monthly visit, patients underwent evaluations every 3 months thereafter. After laser capsulotomy, all patients received topical betamethasone 0.1% eye drops, every 2 h; this regimen was tapered over 2–3 weeks depending on the inflammatory response. Topical apraclonidine eye drops 0.5% were administered 10 min before capsulotomy and twice daily for postcapsulotomy IOP spikes. Patients already on antiglaucoma medications were not administered topical apraclonidine. Sustained IOP elevation was defined as persistence of IOP (>21 mmHg) 2 weeks after laser capsulotomy or sustained IOP elevation >21 mmHg (despite maximum tolerated topical medication).

On each follow-up visit, CDVA recording and IOP measurements were done. Stereoscopic fundus evaluation with +90 D lens and indirect ophthalmoscopy was done at 1 week and at the end of 1st month after laser capsulotomy; these were repeated at 3-monthly intervals.

Anatomical localization of inflammation was done using the International Uveitis Study Group developed criteria and the postprocedural aqueous flare and cells were graded based on Modified Hogan's criteria.[16,17]

Postprocedural improvement in BCVA and the rate of complications were the primary and secondary outcome measures, respectively.

Statistical analysis

Statistical analysis was performed using the IBM statistical software, version 29 (IBM Inc., NY, USA). In patients who had bilateral laser capsulotomies, one eye was randomly selected for data collection and analysis. Normally distributed data was expressed as mean ± standard deviation. 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. Means of groups were compared using *t*-tests. The 95% confidence interval values were calculated for each mean. To lower the risk of type I errors, the statistical significance level was set at $P < 0.05$.

Table 1: Baseline characteristics

Variable	Value, *n* (%)
Age (years)	52.8±11.3
Gender	
Male	114 (44.6)
Female	149 (55.4)
Cataract surgery	
Phacoemulsification	150 (46.9)
Small-incision cataract surgery	100 (53.1)
Conventional extracapsular cataract extraction	10 (3.8)
IOL material	
Polymethyl methacrylate	46 (17.7)
Acrylic	186 (71.5)
Silicone	28 (10.7)
PCO incidence (%)	22.4
PCO subtype	
Membranous	79 (30.4)
Fibrous	109 (41.9)
Fibromembranous	72 (27.7)
Follow-up duration (months)	21.5±11.3
Preprocedural visual acuity (logMAR)	1.09±0.17

PCO: Posterior capsule opacification, IOL: Intraocular lens

Results

After exclusion, hospital records of 260 eyes of 260 patients (males/females: 111/149) who underwent Nd:YAG laser capsulotomy following cataract surgery for uveitis were retrospectively evaluated. Table 1 shows the baseline characteristics of the eyes analyzed in this study. The mean time for PCO development after cataract surgery was 2.4 (range, 1.6–12.8 months). The mean age of patients undergoing Nd:YAG laser capsulotomy was 52.8 ± 11.3 (range, 38–75 years). The mean interval of time from capsulotomy to the final follow-up visit was 21.5 ± 11.3 (range, 9–60 months). The incidence of PCO in uveitic eyes was 22.4.

Table 2 mentions anatomical classification and etiology of uveitis. Out of 260 patients, 150 (57.7%) were diagnosed as anterior uveitis, 31 (12.3%) as intermediate, 49 (18.8%) as posterior and 36 (13.8%) as pan uveitis, respectively.

At baseline, the mean visual acuity was worse than 1 logMAR unit in 127 eyes (48.8%) and between 0.8 and 1 logMAR unit in 133 eyes (51.2%). The mean BCVA improved in 161 (62%) eyes after capsulotomy. The BCVA remained stable in 50 (19.3%) eyes due to preexisting ocular pathology involving the macular area. There was worsening of BCVA in 49 (18.8%) eyes due to glaucoma ($n = 20$), CME ($n = 22$), and RD ($n = 7$). On *post hoc* analysis, it was found that the BCVA in Fuch's heterochromic iridocyclitis was comparable to that of eyes with idiopathic anterior uveitis ($P = 0.246$), rheumatoid arthritis ($P = 0.645$), human leukocyte antigen-B27–related uveitis ($P = 0.233$), and herpetic uveitis ($P = 0.345$), respectively. Figure 1 shows the visual outcome by etiology of uveitis.

There was a significant difference in the initial and total laser energy levels required for capsulotomy with different subtypes of PCO. The mean starting initial energy (single pulse) for membranous (pearl form), fibrous and fibromembranous PCO was 1.6 ± 0.1, 3.0 ± 0.1 and 2.65 ± 0.1 mJ respectively (ANOVA, $P < 0.001$). The mean total (summated) energy for membranous (pearl form), fibrous and fibromembranous PCO was 20.7 ± 2.4, 60.3 ± 6.6, and 55 ± 7.6 mJ, respectively (ANOVA, $P < 0.001$). Fibrous PCO required significantly higher laser energy required to create an opening in the posterior capsule as compared to membranous and fibromembranous PCO [Figure 2].

One hundred and two (39.2%) eyes had mild to moderate anterior chamber reaction on the 1st day after laser capsulotomy. At the end of 2nd postlaser week, 52 eyes (20%) had 2+ anterior chamber cells. In these eyes, topical steroids were continued for 4 weeks and resulted in resolution of inflammation. However, 82 (31.5%) eyes had at least one recurrent episode of uveitis during the follow-up (defined as an episode of uveitis after capsulotomy separated by at least 3 months of inactivity without treatment). The mean interval between laser and recurrence of uveitis was 4.2 ± 0.8 months. Twenty-eight eyes with recurrent episodes of uveitis had persistent vitreous haze at the final follow-up examination. The mean laser energy used in patients with recurrent uveitis was significantly higher (independent *t*-test, $P < 0.001$) than patients without (92 ± 6.4 mJ vs. 58.4 ± 5.8 mJ, respectively). However, it cannot be said whether recurrence was attributable to laser energy *per se* or reactivation of quiescent uveitis.

Transient rise in IOP was seen in 112 (39.2%) eyes after laser capsulotomy. IOP returned to normal limits at 2 weeks in most patients following topical treatment with 0.5% apraclonidine eye drops twice daily. However, sustained elevated IOP (>21 mmHg) was seen in 34 (13%) eyes at a mean

Table 2: Etiology and anatomical classification of uveitis

Etiology/classification	Anterior, *n* (%)	Intermediate, *n* (%)	Posterior, *n* (%)	Pan uveitis, *n* (%)	Total
Idiopathic uveitis	72 (27.7)	-	-	-	72
Ankylosing spondylitis	20 (7.7)	-	-		20
Fuchs heterochromic cyclitis	25 (9.6)	8 (3)	-	-	33
Rheumatoid arthritis	24 (9.2)	-	-	-	24
Herpetic uveitis	9 (3.5)	-	-	-	9
Serpiginous	-	17 (6.5)			17
Vogt-Koyanagi-Harada disease	-		30 (11.5)	13 (5)	43
Sarcoidosis	-	7 (2.7)	6 (2.3)	20 (7.7)	33
Toxoplasmosis	-	-	6 (2.3)	3 (1.1)	9
Acute posterior multifocal placoid pigment epitheliopathy	-	-	7 (2.7)	-	7

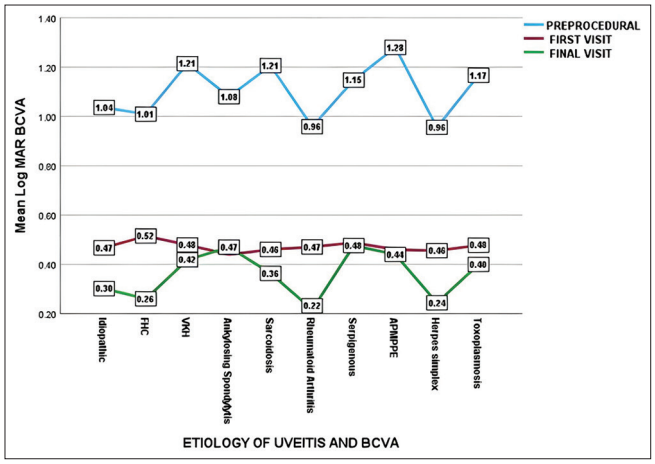

Figure 1: A line diagram comparing visual outcome by etiology of uveitis. BCVA: Best-corrected visual acuity

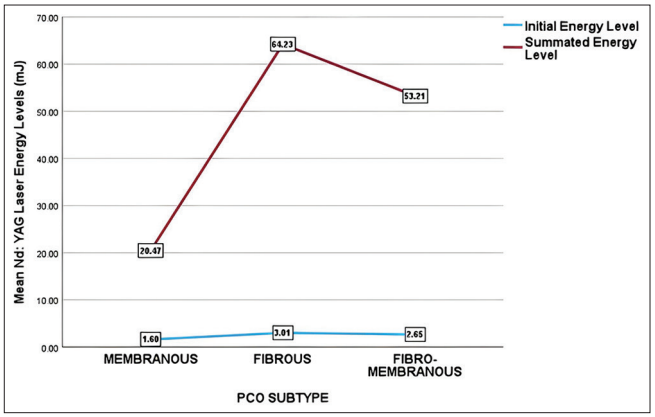

Figure 2: A line diagram comparing Nd:YAG laser energy levels between posterior capsule opacification subtypes. PCO: Posterior capsule opacification

postoperative duration of 18 ± 4 days. Out of these, 20 (7.7%) eyes had medically controlled glaucoma before capsulotomy. These patients were referred to the glaucoma clinic for further management. Trabeculectomy was performed in 10 eyes (3.8%), and four eyes (1.5%) had Ahmed glaucoma valve done.

Table 3 mentions the procedural complications according to the etiology of uveitis. These included glaucoma, CME, PVD, recurrent uveitis, kerratic precipitates behind the lens, and RD. Recurrent uveitis (31.5%), glaucoma (6.1%) and CME (8.4%) were the most frequent complications.

In this study, CME (n = 22) was observed at a mean follow-up of 3.2 ± 1.8 (range, 28 days to 8 months). Most patients (20/91%) with CME had exaggerated postlaser inflammation and recurrent uveitis. Out of these, 16 (72.7%) had a history of CME during the initial episode of uveitis which was subsequently resolved after treatment.

RD was seen in 2.7% patients after a mean duration of 9.8 ± 2.3 months following Nd:YAG laser capsulotomy. These patients had PVD on retinal evaluation before intervention. A higher axial length was observed in 4 (57.1%) patients. The mean laser energy for capsulotomy was significantly higher (independent t-test, $P < 0.001$) in patients with RD than those without (96 ± 5.4 mJ vs. 54.4 ± 5.8 mJ, respectively).

The final vision in patients with postlaser complications is shown in Figure 3.

Discussion

The present study evaluated outcomes and complications of Nd:YAG laser capsulotomy in patients with uveitis. The results of this study revealed that preexisting ocular conditions involving macular area, laser energy, postlaser inflammation, history of CME, glaucoma and preexisting PVD significantly influence outcomes after capsulotomy.

Exaggerated inflammation has been reported in patients with juvenile rheumatoid arthritis (JRA), ankylosing spondylitis, and Fuchs heterochromic cyclitis after surgical intervention.[18] In our study, laser capsulotomy resulted in a significant flare up of inflammation (2+ inflammatory cells) in this subset of patients (except JRA). Second, a significantly higher number of patients with these conditions had episodes of recurrent uveitis following capsulotomy. This suggests that apart from laser energy *per se*, the etiology of uveitis may be one of the critical determinants for treatment response and subsequent outcome.

A search of major databases including PubMed did not reveal any study reporting uveitis etiology in patients undergoing laser capsulotomy. The studies by Suresh and Jones[19] and Elgohary

Table 3: Postoperative complications and etiology of uveitis

Etiology	CME, *n* (%)	Glaucoma, *n* (%)	PVD, *n* (%)	Recurrent uveitis, *n* (%)	RD, *n* (%)
Idiopathic uveitis	2 (0.7)	4 (1.5)	0	12 (4.6)	0
Ankylosing spondylitis	4 (1.5)	2 (0.7)	0	18 (6.9)	0
Fuchs heterochromic cyclitis	4 (1.5)	14 (5.4)	2 (0.7)	14 (5.4)	1 (0.4)
Rheumatoid arthritis	0	0	0	4 (1.5)	0
Herpetic uveitis	0	2 (0.7)	0	2 (0.7)	0
Serpiginous	4 (1.5)	4 (1.5)	2 (0.7)	12 (4.6)	0
Vogt-Koyanagi-Harada disease	4 (1.5)	2 (0.7)	6 (2.3)	8 (3)	3 (1.1)
Sarcoidosis	2 (0.7)	4 (1.5)	4 (1.5)	14 (5.4)	2 (0.7)
Toxoplasmosis	0	0	0	0	0
Acute posterior multifocal placoid pigment epitheliopathy	2 (0.7)	2 (0.7)	2 (0.7)	0	1 (0.4)
Total	22 (8.4)	34 (13)	16 (6.1)	84 (32.3)	7 (2.7)

CME: Cystoid macular edema, PVD: Posterior vitreous detachment, RD: Retinal detachment

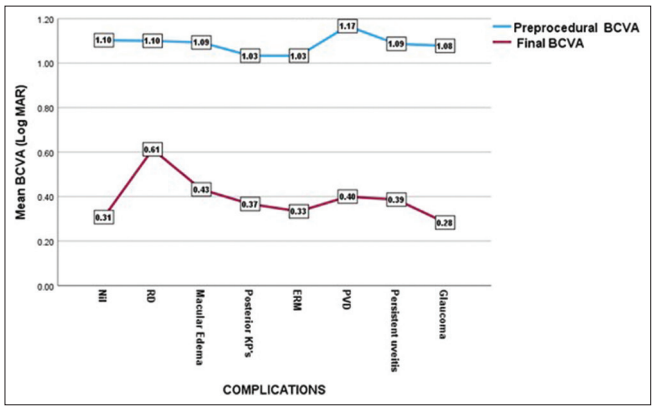

Figure 3: A line diagram comparing visual outcome by complications of laser capsulotomy. BCVA: Best-corrected visual acuity

et al.[20] primarily evaluated phacoemulsification outcomes in patients with uveitis; these studies were underpowered due to the smaller number of uveitic patients receiving laser capsulotomy (n = 19 ± 33 = 52). Another study by Kolli *et al*. (n = 39) did not report uveitis etiology.[10]

Several studies have reported an association between IOP elevation and laser energy used for capsulotomy. Ari *et al*. reported that the severity and duration of IOP elevation was less when the total laser energy was <80 mJ.[21] Karahan *et al*. observed that IOP elevation was significantly greater in the capsulotomy group with higher laser energy.[22] Our study agreed with these studies; the mean laser energy was significantly higher in patients with sustained IOP elevation as compared to those without IOP elevation (84 ± 6.8 vs. 52.6 ± 4.4 mJ), respectively. While most of these patients had medically controlled glaucoma (on two antiglaucoma medications) before capsulotomy, 14 (5.4%) patients did not have a history of glaucoma. Possibly, higher laser energy may flare up uveitis or reduce aqueous out flow due to blockage of trabecular meshwork by capsular debris, vitreous material and other factors leading to sustained IOP elevation.[23,24]

In general, the reported incidence of CME after capsulotomy ranges from 0.5% to 2.5%.[25] The incidence of CME following capsulotomy in uveitis has been rarely reported. The incidence of CME in patients with uveitis was significantly higher (8.4%); it was observed at a mean postcapsulotomy duration of 3.2 months. Elgohary *et al*. reported that one (3%) patient developed cystoid macular edema within 3 months of Nd:YAG Laser capsulotomy.[20] In our study, patients with exaggerated postprocedural inflammation, recurrent uveitis, and history of CME were the potential risk factors. Other factors like higher laser energy used may also play a potential role. The latter observation agreed with the study by Bhargava *et al*.; they found that the total laser energy in eyes with CME was significantly higher as compared to eyes without CME (78 ± 18 mJ vs. 42 ± 26 mJ, ($P < 0.001$).[12]

The reported incidence of RD after laser capsulotomy range from 0% to 3.6%.[26,27] The study by Bhargava *et al*. observed RD in 11 (2.3%) eyes at a mean postlaser duration of 11.7 ± 0.8 months.[12] The incidence of RD after laser capsulotomy in eyes with uveitis is not known. We report an incidence of 2.7%. Preexisting PVD, longer axial length and higher energy levels were significant risk factors for RD (102 ± 5.4 mJ vs. 54.4 ± 5.8 mJ, respectively). The later observation agreed with a Bosnian study that found a significant association between total laser energy levels and complications such as RD and CME.[28] Several potential mechanisms have been proposed for RD after laser capsulotomy. One school of thought believes that Nd:YAG laser application leads vitreous liquefaction; this may facilitate preexisting retinal breaks to progress to RD.[29,30]

Our study had several limitations. Selection bias cannot be eliminated in a retrospective study. The study was underpowered to assess temporal and causal relationship. As patients from one geographical region of the world were evaluated, etiology of uveitis was not reflective of the world population.

In conclusion, laser capsulotomy in patients with uveitis may lead to sustained IOP elevation, development of CME and RD. Exaggerated postprocedural inflammation, recurrent uveitis and higher laser energy were risk factors for CME. Preexisting

PVD and higher laser energy levels may be risk factors for RD. In uveitis, Nd:YAG laser capsulotomy should be performed with caution in patients with history of CME, glaucoma, PVD, and preexisting retinal breaks.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Pandey SK, Apple DJ, Werner L, Maloof AJ, Milverton EJ. Posterior capsule opacification: A review of the aetiopathogenesis, experimental and clinical studies and factors for prevention. Indian J Ophthalmol 2004;52:99-112.
2. Belda JI, Placeres J, Elvira JC, Puig X, Pérez-Vives C, Zou M, *et al.* Costs and healthcare resource utilization associated with posterior capsule opacification after cataract surgery with five different intraocular lenses: An economic analysis for Spain. Clin Ophthalmol 2022;16:993-1001.
3. Bhargava R, Kumar P, Prakash A, Chaudhary KP. Estimation of mean ND: Yag laser capsulotomy energy levels for membranous and fibrous posterior capsular opacification. Nepal J Ophthalmol 2012;4:108-13.
4. Schaumberg DA, Dana MR, Christen WG, Glynn RJ. A systematic overview of the incidence of posterior capsule opacification. Ophthalmology 1998;105:1213-21.
5. Bhargava R, Kumar P, Sharma SK, Kaur A. A randomized controlled trial of peeling and aspiration of Elschnig pearls and neodymium: Yttrium-aluminium-garnet laser capsulotomy. Int J Ophthalmol 2015;8:590-6.
6. Baheti U, Siddique SS, Foster CS. Cataract surgery in patients with history of uveitis. Saudi J Ophthalmol 2012;26:55-60.
7. Bhargava R, Pandey K, Mehta B. Long-term outcomes of small-incision cataract surgery in patients with uveitis. Indian J Ophthalmol 2022;70:3927-32.
8. Bhargava R, Kumar P, Sharma SK, Sharma S, Mehra N, Mishra A. Peeling and aspiration of Elschnig pearls! An effective alternative to Nd:YAG laser capsulotomy! Indian J Ophthalmol 2013;61:518-20.
9. Bhargava R, Kumar P, Sharma SK, Kumar M, Kaur A. Phacoemulsification versus small incision cataract surgery in patients with uveitis. Int J Ophthalmol 2015;8:965-70.
10. Kolli H, Evers C, Murray PI. Nd:YAG laser posterior capsulotomy in adult patients with uveitis. Ocul Immunol Inflamm 2021;29:1537-9.
11. Steinert RF, Puliafito CA. The Nd: YAG Laser in Ophthalmology. Principles, Clinical Application, and Photo Disruption. Philadelphia: WB Saunders; 1983.
12. Bhargava R, Kumar P, Phogat H, Chaudhary KP. Neodymium-yttrium aluminium garnet laser capsulotomy energy levels for posterior capsule opacification. J Ophthalmic Vis Res 2015;10:37-42.
13. Sundelin K, Sjöstrand J. Posterior capsule opacification 5 years after extracapsular cataract extraction. J Cataract Refract Surg 1999;25:246-50.
14. Al-Essa RS, Alfawaz AM. New insights into cataract surgery in patients with uveitis: A detailed review of the current literature. Saudi J Ophthalmol 2022;36:133-41.
15. Murrill CA, Stanfield DL, Van Brocklin MD. Capsulotomy. Optom Clin 1995;4:69-83.
16. Jabs DA, Nussenblatt RB, Rosenbaum JT, Standardization of Uveitis Nomenclature (SUN) Working Group. Standardization of uveitis nomenclature for reporting clinical data. Results of the first international workshop. Am J Ophthalmol 2005;140:509-16.
17. Hogan MJ, Kimura SJ, Thygeson P. Signs and symptoms of uveitis. I. Anterior uveitis. Am J Ophthalmol 1959;47:155-70.
18. Bolletta E, Coassin M, Iannetta D, Mastrofilippo V, Aldigeri R, Invernizzi A, *et al.* Cataract surgery with intraocular lens implantation in juvenile idiopathic arthritis-associated uveitis: Outcomes in the era of biological therapy. J Clin Med 2021;10:2437.
19. Suresh PS, Jones NP. Phacoemulsification with intraocular lens implantation in patients with uveitis. Eye (Lond) 2001;15:621-8.
20. Elgohary MA, McCluskey PJ, Towler HM, Okhravi N, Singh RP, Obikpo R, *et al.* Outcome of phacoemulsification in patients with uveitis. Br J Ophthalmol 2007;91:916-21.
21. Ari S, Cingü AK, Sahin A, Çinar Y, Çaça I. The effects of Nd:YAG laser posterior capsulotomy on macular thickness, intraocular pressure, and visual acuity. Ophthalmic Surg Lasers Imaging 2012;43:395-400.
22. Karahan E, Tuncer I, Zengin MO. The effect of ND:YAG laser posterior capsulotomy size on refraction, intraocular pressure, and macular thickness. J Ophthalmol 2014;2014:846385.
23. Chawla H, Singh MD, Vohra V. Clinical implications of energy used in Neodymium: Yttrium aluminum garnet posterior capsulotomy on intraocular pressure. Indian J Ophthalmol 2021;69:2717-20.
24. Achiron A. Intraocular pressure spikes following neodymium-doped yttrium aluminum garnet laser capsulotomy: Current prevalence and management in Israel. J Curr Glaucoma Pract 2017;11:63-6.
25. Dot C, Schweitzer C, Labbé A, Lignereux F, Rozot P, Goguillot M, *et al.* Incidence of retinal detachment, macular edema, and ocular hypertension after neodymium: Yttrium-aluminum-garnet capsulotomy: A population-based nationwide study-the French YAG 2 study. Ophthalmology 2023;130:478-87.
26. Jahn CE, Richter J, Jahn AH, Kremer G, Kron M. Pseudophakic retinal detachment after uneventful phacoemulsification and subsequent neodymium: YAG capsulotomy for capsule opacification. J Cataract Refract Surg 2003;29:925-9.
27. Bechrakis NE, Dimmer A. Rhegmatogenous retinal detachment: Epidemiology and risk factors. Ophthalmologe 2018;115:163-78.
28. Alimanović-Halilović E. Complications in the posterior eye segment after Nd-YAG laser capsulotomy. Med Arh 2004;58:7-9.
29. Ranta P, Tommila P, Kivelä T. Retinal breaks and detachment after neodymium: YAG laser posterior capsulotomy: Five-year incidence in a prospective cohort. J Cataract Refract Surg 2004;30:58-66.
30. Harun S, Kumar BV, Prasad SD. Retinal breaks and detachment after neodymium: YAG laser posterior capsulotomy. J Cataract Refract Surg 2005;31:1480.