• Clinical Research •

Stability of neodymium:YAG laser posterior capsulotomy in eyes with capsular tension rings

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Abstract

● **AIM:** To evaluate the stability of neodymium (Nd):YAG laser posterior capsulotomy in eyes with capsular tension rings (CTRs).

● **METHODS:** A total of 60 eyes that underwent cataract surgery and laser posterior capsulotomy postoperatively were included in this retrospective cohort study. To evaluate the safety and stability of capsulotomy, changes in the size of posterior capsulotomy and anterior chamber depth (ACD) in three groups: the group without CTR, the group with 12 mm CTRs, and the group with 13 mm CTRs, at 1wk, 3, 12, and 15mo after capsulotomy, were compared.

● **RESULTS:** In the group without CTR and the group with 12 mm CTR, there was no significant change in ACD at every post-laser follow-up. In the group with 13 mm CTR, the ACD change was significant until 3mo after capsulotomy. In all groups, there was a significant increase in the area of capsulotomy between 1wk and 3mo post-laser. Between 3 and 12mo post-laser, only the group with 13 mm CTR showed a significant increase in the area of capsulotomy (P<0.01).

● **CONCLUSION:** Laser posterior capsulotomy is safe in all three groups. The capsulotomy and ACD become stabilized and have not shown significant changes since 1y post-laser, even with larger CTRs. The maintenance of centrifugal capsular tension can last longer with larger CTRs, and the stability of the capsulotomy site can be reached about 12mo after capsulotomy in pseudophakic eyes with larger CTRs.

● **KEYWORDS:** Nd:YAG laser; capsulotomy; capsular tension ring

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INTRODUCTION

It is important to polish the posterior capsule during cataract surgery to remove the remaining cortical fiber that can hinder visual recovery after cataract surgery[1].

In the presence of zonular weakness, it is not easy to polish the posterior capsule because zonular weakness causes frequent anteroposterior movement of the posterior capsule[2]. The resultant remaining posterior capsular fiber or proliferation of equatorial lens epithelial cells (LEC) can cause posterior capsule opacity (PCO) after cataract surgery, which can be removed by neodymium (Nd):YAG laser posterior capsulotomy. Nd:YAG laser capsulotomy can be done easily in a short time, and immediate recovery of visual acuity is possible[3]. However, there are several reports of complications following Nd:YAG laser posterior capsulotomy, such as intraocular lens (IOL) dislocation, IOL damage, as well as retinal complications[4-7].

The stability of the IOL after Nd:YAG laser capsulotomy can be affected by the type of IOL and the fibrotic reaction between the IOL and posterior capsule[6-8].

We assume that intraocular devices, such as IOLs and capsular tension rings (CTRs), inserted inside the capsular bag can affect the tension of the capsular bag due to the intrinsic forces of the device itself. With these intrinsic forces inside the capsule, when an Nd:YAG laser is applied to the posterior capsule to make an opening, the forces of the device, which affect capsular tension, can deform the shape or size of the opening. This deformity of the capsular opening can differ according to the intrinsic forces inside of the capsule, such as IOL type, material, and the presence of CTRs[9]. We regarded the enlargement of posterior capsulotomy area according to the time after Nd:YAG laser capsulotomy as being related to the maintenance of CTR centrifugal stretching force the same way that the anterior capsular opening contracture is regarded as the centripetal contracture force of the continuous curvilinear capsulorhexis (CCC) margin due to zonular laxity[10].

In this study, we evaluated the stability of the area of capsulotomy as well as the change in anterior chamber depth (ACD). As far as we know, this is the first study evaluating the effect of posterior capsulotomy in CTR-inserted eyes.

SUBJECTS AND METHODS

Ethical Approval The Institutional Review Board (IRB)/ Ethics Committee approval of St. Vincent's hospital was obtained (approval number: VC23RISI0020). All research was conducted in accordance with the tenets of the Declaration of Helsinki. The informed consent was obtained from the participants before surgery and laser.

A retrospective cohort study of 60 eyes was performed with patients undergoing cataract surgery and Nd:YAG laser posterior capsulotomy postoperatively. Surgeries were performed by one surgeon (Cho YK). The inclusion criteria for patients consisted of 60 or more years of age, an axial length longer than 21.0 mm and less than 25.0 mm, clinically significant cataracts, and with postoperative Nd:YAG laser capsulotomy over 15mo of post-laser follow-up.

Phacodonesis and capsular wrinkling upon the performance of CCC were regarded as indications for CTR insertion.

The exclusion criteria were a visible area of zonulysis preoperatively and intraoperatively, previous ocular surgery, intraoperative posterior capsule rupture, and abnormal corneal topographic patterns.

In all patients, one-piece acrylic IOLs (ZCB00®; Abbot Medical Optics, Santa Ana, CA, USA) were inserted. CTRs (Ophtec, Groningen, The Netherlands) were inserted just before IOL insertion, and the choice of CTR size was made according to the severity of phacodonesis during CCC.

PCO at postoperative follow-up was measured using slit lamp microscopic examination according to the grading by Congdon *et al*[11] as follows: from absent (Grade 0) to severe opacity (Grade 4; central/paracentral opacity as defined above but sufficient to make the visualization of fundus details difficult or impossible).

Nd:YAG laser capsulotomy was done according to patient discomfort and the grade of PCO. The capsulotomy was tried as a cruciate pattern to make an opening size larger than the normal pupil size.

The time interval between Nd:YAG laser capsulotomy and cataract surgery was recorded, and the total YAG energy used in the capsulotomy was recorded as follows [YAG energy (mJ/pulse) × pulse number].

At 1wk, 3, 12, 15mo post-laser, the area of capsulotomy was measured, recorded, and photographed with sufficiently dilated pupils. These measurements were performed by an ophthalmologist who was blind to CTR insertion. The capsulotomy area was measured using Image J software as the percentage area of the laser capsulotomy in reference to the total corneal area. The total corneal area was defined as the area contained by the corneal limbus (Figure 1).

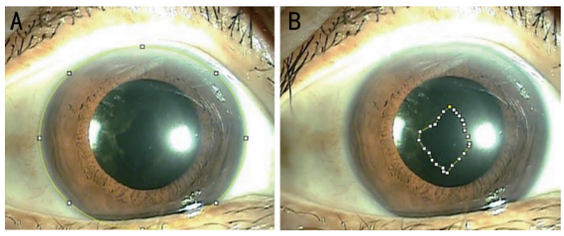

Figure 1 Representative picture of the calculation of the neodymium:YAG posterior capsulotomy area percentage The yellow line (A) represents the total corneal area, and the white line (B) represents the area of the capsulotomy. The capsulotomy area was measured as the percentage area in reference to the total corneal area.

As well as Nd:YAG laser capsulotomy area, ACD was compared between groups pre-laser and, 1wk, 3, 12, and 15mo post-laser. ACD was measured as the distance between the central corneal anterior surface and the anterior surface of the IOL using an A-scan ultrasound (AVISO; Carl Zeiss Meditec Ag, France). These measurements were performed by an ophthalmic technician who was blind to CTR insertion.

All patients were divided into three groups for analysis: Group 1 (No CTR group), patients that underwent cataract surgery without a CTR and with postoperative Nd:YAG laser capsulotomy; Group 2 (12 mm CTR insertion), patients that underwent cataract surgery with 12 mm CTRs and Nd:YAG laser capsulotomy; and Group 3 (13 mm CTR insertion), patients that underwent cataract surgery with a 13 mm CTR and Nd:YAG laser capsulotomy.

Statistical Analysis SPSS Statistics for Windows software (version 11.5; SPSS Inc, Chicago, IL, USA) was used for statistical analyses. An analysis of variance test with a post hoc analysis was applied to compare data between groups. To compare the change of ACD and YAG laser capsulotomy area with the time of each follow-up visit, we used a pared *t*-test. To compare the frequency of PCO type and accompanied systemic disease according to each group, we used the Chi-square test and Fisher's exact test, respectively. A *P*-value less than 0.05 was considered statistically significant.

RESULTS

Table 1 shows the demographics of the patients. There were no significant differences between groups in age, axial length, ACD before cataract surgery, ACD before capsulotomy, grade of PCO, type of PCO, total Nd:YAG laser energy, or time elapsed between Nd:YAG laser capsulotomy and cataract surgery.

In the evaluation of systemic disease, five patients were with diabetes mellitus and six patients were with hypertension

Table 1 Demographics of patients of three groups mean±SEM

Parameters	Group 1 (21 eyes)	Group 2 (22 eyes)	Group 3 (17 eyes)	*P*
Age (y)	69.71±2.46	72.09±1.80	69.71±2.53	>0.05[a]
Axial length (mm)	23.81±0.07	22.90±0.33	23.96±0.49	>0.05[a]
Pre-cataract surgery ACD (mm)	3.33±0.03	3.10±0.14	2.97±0.18	>0.05[a]
Pre-YAG laser ACD (mm)	4.60±0.08	4.87±0.10	4.30±0.50	>0.05[a]
Grade of PCO[11]	2.48±0.11	2.50±0.11	2.53±0.12	>0.05[a]
PCO type (fibrous type:pearl type)	10:11	11:11	8:9	>0.05[b]
Time of YAG from cataract surgery (mo)	13.29±1.24	13.23±1.41	11.94±1.45	>0.05[a]
YAG energy (mJ × pulse number)	7.41±0.37	7.37±0.36	7.34±0.42	>0.05[a]
Systemic disease				
Diabetes mellitus, *n* (%)	2 (9.5)	2 (9.0)	1 (5.8)	>0.05[c]
Hypertension, *n* (%)	2 (9.5)	3 (13.6)	1 (5.8)	>0.05[c]

Group 1: Patients that underwent cataract surgery without capsular tension ring (CTR) insertion and with postoperative neodymium (Nd):YAG laser capsulotomies; Group 2: Patients that underwent cataract surgery with 12 mm CTRs and Nd:YAG laser capsulotomies; Group 3: Patients that underwent cataract surgery with 13 mm CTRs and Nd:YAG laser capsulotomies. PCO: Posterior capsule opacity; ACD: Anterior chamber depth. [a]ANOVA (analysis of variance) test with a post hoc analysis; [b]Chi-square test; [c]Fisher's exact test.

Table 2 Change of ACD and capsulotomy mean±SEM

Group	Before Nd:YAG	1wk after Nd:YAG	3mo after Nd:YAG	12mo after Nd:YAG	15mo after Nd:YAG
ACD (mm)					
Group 1 (21 eyes)	4.60±0.08	4.60±0.07	4.56±0.07	4.58±0.07	4.57±0.08
		P>0.05	*P*>0.05	*P*>0.05	*P*>0.05
Group 2 (22 eyes)	4.87±0.10	4.90±0.09	4.82±0.05	4.83±0.05	4.83±0.06
		P>0.05	*P*>0.05	*P*>0.05	*P*>0.05
Group 3 (17 eyes)	4.30±0.29	4.33±0.18	4.62±0.13	4.64±0.12	4.64±0.11
		P=0.048	*P*=0.027	*P*>0.05	*P*>0.05
Percentage area of posterior capsulotomy					
Group 1 (21 eyes)	NA	7.79±0.33	8.77±0.25	8.73±0.23	8.73±0.24
			P=0.013	*P*>0.05	*P*>0.05
Group 2 (22 eyes)	NA	8.43±0.17	8.77±0.22	8.83±0.22	8.83±0.23
			P=0.013	*P*>0.05	*P*>0.05
Group 3 (17 eyes)	NA	8.36±0.35	10.53±0.33	11.04±0.40	11.04±0.42
			P=0.004	*P*=0.004	*P*>0.05

Group 1: Patients that underwent cataract surgery without capsular tension ring (CTR) insertion and with postoperative neodymium (Nd):YAG laser capsulotomies; Group 2: Patients that underwent cataract surgery with 12 mm CTRs and Nd:YAG laser capsulotomies; Group 3: Patients that underwent cataract surgery with 13 mm CTRs and Nd:YAG laser capsulotomies. SEM: Standard error mean; PCO: Posterior capsule opacity; ACD: Anterior chamber depth; NA: Non-applicable. *P* value: Pared *t* test.

(Table 1). There was no definite diabetic retinopathy and hypertensive retinopathy in the slit lamp examination of fundus. We did not include the systemic status of diabetes, such as glucose level in this study, because the five diabetic patients didn't take oral hypoglycemic therapy or insulin during the study period. The six patients with hypertension were taking aspirin during the study period with cessation for 3d before cataract surgery.

Table 2 and Figure 2 show the change in ACD in the three groups. In Groups 1 and 2, there was no significant change of ACD in all follow-up visits 1wk and 3, 12, 15mo post-laser. Only In Group 3, ACD change was significant 1wk post-laser compared with before Nd:YAG laser capsulotomy (*P*=0.048), and the significant ACD change lasted until 3mo post-laser (*P*=0.027). Between 3 and 15mo post-laser, there was no significant ACD change in all three groups.

Table 2 and Figure 3 show the change in the area of capsulotomy in the three groups. All three groups showed a significant increase in capsulotomy area between 1wk and 3mo post-laser (*P*=0.013, 0.013, 0.004, respectively). Group 3 showed a significant increase in capsulotomy area until 12mo post-laser (*P*=0.004). Between 12 and 15mo post-laser, all three groups showed no significant changes in the capsulotomy area.

There were no retinal IOL complications due to the enlargement of the capsulotomy opening performed in our study.

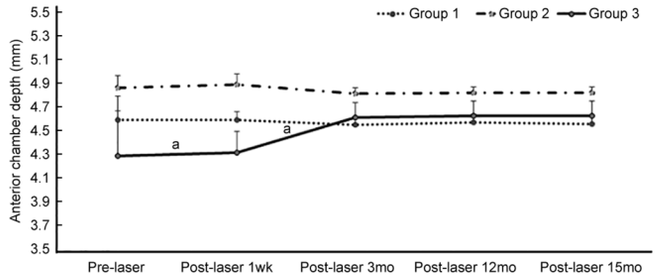

Figure 2 ACD change after Nd:YAG laser capsulotomy according to time in the three groups ACD change was significant only in group 3, 1wk post-laser compared with before Nd:YAG laser capsulotomy, and the significant ACD change lasted until 3mo post-laser. Group 1: Patients that underwent cataract surgery without CTR insertion and with postoperative Nd:YAG laser capsulotomies; Group 2: Patients that underwent cataract surgery with 12 mm CTRs and Nd:YAG laser capsulotomies; Group 3: Patients that underwent cataract surgery with 13 mm CTRs and Nd:YAG laser capsulotomies. Nd: Neodymium; CTR: Capsular tension ring; ACD: Anterior chamber depth. [a]*P*<0.05.

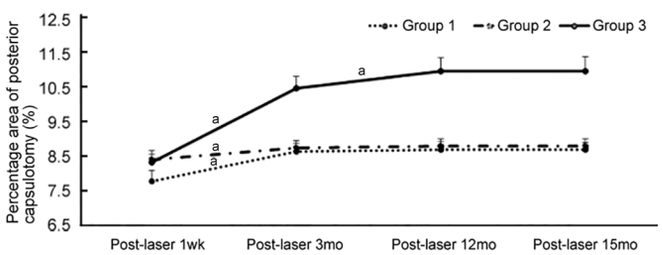

Figure 3 Change in the capsulotomy area (percentage) according to time in the three groups All three groups showed a significant increase in capsulotomy area between 1wk and 3mo post-laser. Group 3 showed a significant increase in capsulotomy area until 12mo post-laser. Group 1: Patients that underwent cataract surgery without CTR insertion and with postoperative Nd:YAG laser capsulotomies; Group 2: Patients that underwent cataract surgery with 12 mm CTRs and Nd:YAG laser capsulotomies; Group 3: Patients that underwent cataract surgery with 13 mm CTRs and Nd:YAG laser capsulotomies. Nd: Neodymium; CTR: Capsular tension ring. [a]*P*<0.05.

DISCUSSION

CTRs implantation can benefit cataract patients with weak zonules by maintaining the shape of the capsular bag, reducing capsule shrinkage, stabilizing IOL and reducing the incidence of PCO[3,12-13]. The proposed mechanism of reduced PCO due to CTRs is that CTR may mechanically stretch the capsular bag and reduce the distance between the IOL and the capsular bag, make the posterior lens capsule completely adhered to the posterior IOL surface, inhibit LEC migrations, and reduce the development of PCO[9,12]. However, there are still CTR-inserted eyes with PCO, in which Nd:YAG laser capsulotomy is needed.

Nd:YAG laser posterior capsulotomy can change the anterior segment parameter in pseudophakic eyes[14-16]. Also, intraocular devices, such as IOL and CTRs, can change the anterior segment parameter and the severity of PCO in pseudophakic eyes[12,17]. In this study, we evaluated changes in anterior segment parameters in pseudophakic eyes with both CTRs and Nd:YAG capsulotomies. According to the study by Monteiro *et al*[8], YAG laser capsulotomy results in ACD deepening in eyes with IOL of C-loop acrylic hydrophobic single-piece IOL differently from the plate haptic IOL.

In our study, though we inserted C-loop acrylic hydrophobic single-piece IOLs in all groups, the ACD deepening after capsulotomy was not observed in the group with Nd:Yag laser capsulotomy only (Group 1). Instead, in the group with 13 mm CTRs (Group 3), significant ACD deepening after Nd:YAG laser capsulotomy lasted until 3mo of follow-up post-laser. We suggest the following explanations: In eyes with 13 mm CTR, when posterior capsule opening occurs after Nd:YAG laser capsulotomy, the haptic offset effect of a one-piece IOL can be augmented, so the posterior compressing effect of angled, C-looped IOLs could have caused ACD deepening in Group 3, in which 13 mm CTRs mechanically stretch the capsular bag wide and reduce the distance between the IOL and the capsular bag[18-19].

According to the type of PCO, Nd:YAG laser directed towards the fibrous type of PCO needs higher energy[20] and can result in an inadvertent extension of the PCO site. However, we did not find an association between capsulotomy enlargement and PCO type.

In eyes with CTRs, there was more intracapsular force working outward, centrifugally. This force would be larger with larger diameter CTRs. With this force, which remains inside the capsule, Nd:YAG laser capsulotomy can result in extension of the capsulotomy opening.

Though we tried the lowest possible Nd:YAG energy application to get the necessary opening size using the smallest number of pulses, all three groups showed an increase in capsulotomy area between 1wk and 3mo post-laser.

Nd:YAG laser capsulotomy is a simple and easy treatment for PCO that can restore clear visual axes in a short time. However, there are several reports of complications.

Besides retinal complications after Nd:YAG laser capsulotomy, there are reports of IOL dislocation[7,21-22].

While this study evaluated only the effect of Nd:YAG laser on posterior capsulotomy, there is a recently published article to compare the circularity and centration of anterior capsulotomy and visual outcomes, according to the difference produced by different energy sources; precision pulse capsulotomy (PPC), manual-CCC (M-CCC), and femtosecond laser assisted capsulotomy (FLAC). In the future study, we are planning the evaluation of effect of CTR on the anterior capsulotomy as well as the posterior capsulotomy[23].

We assume a similar hypothesis to that made by Petersen *et al*[22], in which IOLs with posterior bowing were suggested to exert pressure on the posterior capsule. This pressure may exploit the capsulotomy area in the posterior capsule, especially after an Nd:YAG laser capsulotomy. In addition, the lack of fibrotic reaction between the capsules and the IOL prevents the effective fixation of these lenses, especially in pseudophakic eyes in relatively earlier postoperative periods.

As we expected, in all groups, the capsulotomy opening site was enlarged until 3mo post-laser. In the group with large diameter CTRs (13 mm CTRs), the enlargement was significant until 1y post-laser due to stronger centrifugal counter force.

Between 12 and 15mo after Nd:YAG laser capsulotomy, there was no significant change in the area of the capsulotomy opening in all three groups. We suggest that the stability of the capsulotomy opening can be reached about 12mo after laser capsulotomy in pseudophakic eyes with CTRs.

This study has some limitations. The change of capsulotomy area and ACD after 15mo post-laser was not evaluated due to relatively short follow-up period in the study. The choice of CTR size was done by the surgeon's decision according to the severity of phacodonesis during CCC which cannot be measured numerically.

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Conflicts of Interest: Cho YK, None; **Kim MS,** None.

REFERENCES

1 Ucar F, Cetinkaya S. Posterior capsular vacuuming to avoid PCO formation. *Int Ophthalmol* 2022;42(10):3089-3095.

2 Haripriya A, Ramulu PY, Schehlein EM, Shekhar M, Chandrashekharan S, Narendran K, Venkatesh R, Sithiq M, Ramakrishnan R, Ravindran RD, Robin AL. The aravind pseudoexfoliation study: 5-year postoperative results. the effect of intraocular lens choice and capsular tension rings. *Am J Ophthalmol* 2020;219:253-260.

3 Schartmüller D, Schriefl S, Schwarzenbacher L, Leydolt C, Kundi M, Pieh S, Menapace R, Kriechbaum K. Posterior capsule opacification and Nd:YAG laser rates with two hydrophobic acrylic single-piece IOLs. *Eye* (*Lond*) 2020;34(5):857-863.

4 Liu HY, Liu XJ, Chen YT, Wang DF, Li YS, Chen HJ, Ma XL. Effect of Nd:YAG laser capsulotomy on the risk for retinal detachment after cataract surgery: systematic review and meta-analysis. *J Cataract Refract Surg* 2022;48(2):238-244.

5 Kim JS, Kang MJ, Jeong KD, Hwang JH. Haptic fracture and dislocation of polyimide intraocular lens after neodymium:YAG laser capsulotomy: a case report. *Medicine* (Baltimore) 2019;98(20):e15720.

6 Kang KT, Kim YC. Dislocation of polyfocal full-optics accommodative intraocular lens after neodymium-doped yttrium aluminum garnet capsulotomy in vitrectomized eye. *Indian J Ophthalmol* 2013;61(11):678-680.

7 Kim TY, Kang HG, Kim CY, Koh HJ, Kim SS, Kim M. Delayed vitreous prolapse after cataract surgery: clinical features and surgical outcomes. *Sci Rep* 2021;11(1):16107.

8 Monteiro T, Soares A, Dourado Leite R, Franqueira N, Faria-Correia F, Vaz F. Comparative study of induced changes in effective lens position and refraction after Nd:YAG laser capsulotomy according to intraocular lens design. *Clin Ophthalmol* 2018;12:533-537.

9 Yang SF, Jiang H, Nie KL, Feng LW, Fan W. Effect of capsular tension ring implantation on capsular stability after phacoemulsification in patients with weak zonules: a randomized controlled trial. CTR implantation in cataract patients with weak zonules. *BMC Ophthalmol* 2021;21(1):19.

10 Elmohamady MN, Elhabbak A, Gad EA. Circular YAG laser anterior capsulotomy for anterior capsule contraction syndrome. *Int Ophthalmol* 2019;39(11):2497-2503.

11 Congdon N, Fan H, Choi K, *et al*. Impact of posterior subcapsular opacification on vision and visual function among subjects undergoing cataract surgery in rural China: study of Cataract Outcomes and Up-Take of Services (SCOUTS) in the Caring is Hip Project, report 5. *Br J Ophthalmol* 2008;92(5):598-603.

12 Maedel S, Evans JR, Harrer-Seely A, Findl O. Intraocular lens optic edge design for the prevention of posterior capsule opacification after cataract surgery. *Cochrane Database Syst Rev* 2021;8(8):CD012516.

13 Zhang KK, Dong YC, Zhao MS, Nie LL, Ding XF, Zhu C. The effect of capsule tension ring on posterior capsule opacification: a meta-analysis. *PLoS One* 2021;16(3):e0246316.

14 El-Haddad NSEM. The impact of Nd:YAG laser posterior capsulotomy by the use of "the circular pattern with vitreous strand cut" technique on anterior chamber parameters. *Lasers Med Sci* 2019;34(2):353-357.

15 Tan Y, Zhang JQ, Li W, Jin GM, Luo LX, Liu ZZ. Refraction shift after Nd: YAG posterior capsulotomy in pseudophakic eyes: a systematic review and meta-analysis. *J Refract Surg* 2022;38(7):465-473.

16 Delgado João M, Costa JV, Monteiro T, Franqueira N, Faria Correia F, Vaz F. Intraocular lens position and anterior chamber parameters evaluation after Nd: YAG laser posterior capsulotomy for posterior capsular opacification using anterior segment swept-source optical coherence tomography. *Clin Ophthalmol* 2022;16:153-159.

17 Kwon H, Choi A, Kim B, Jeon S. Effect of capsular tension ring on refractive outcomes in patients with implantation of the quadrifocal acrysof PanOptix TFNT00 IOL. *J Refract Surg* 2021;37(3):174-179.

18 Miyata K, Kataoka Y, Matsunaga J, Honbo M, Minami K. Prospective comparison of one-piece and three-piece tecnis aspheric intraocular lenses: 1-year stability and its effect on visual function. *Curr Eye Res* 2015;40(9):930-935.

19 Findl O, Hirnschall N, Nishi Y, Maurino V, Crnej A. Capsular bag performance of a hydrophobic acrylic 1-piece intraocular lens. *J Cataract Refract Surg* 2015;41(1):90-97.

20 Hawlina G, Perovšek D, Drnovšek-Olup B, MoŽina J, Gregorčič P. Optical coherence tomography for an *in-vivo* study of posterior-

capsule-opacification types and their influence on the total-pulse energy required for Nd: YAG capsulotomy: a case series. *BMC Ophthalmol* 2014;14:131.

21 Levy JH, Pisacano AM, Anello RD. Displacement of bag-placed hydrogel lenses into the vitreous following neodymium: YAG laser capsulotomy. *J Cataract Refract Surg* 1990;16(5):563-566.

22 Petersen AM, Bluth LL, Campion M. Delayed posterior dislocation of silicone plate-haptic lenses after neodymium: YAG capsulotomy. *J Cataract Refract Surg* 2000;26(12):1827-1829.

23 Reddy JC, Devta S, Vupparaboina KK, Ali MH, Vaddavalli PK. Early results of circularity and centration of capsulotomy prepared by three different methods. *Int J Ophthalmol* 2021;14(1):76-82.