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Influence of posterior capsular opacity and its removal on retinal nerve fiber layer thickness measured with spectral domain optical coherence tomography

Umit Calli[1], Taha Ayyildiz[2], Genc Selim[3], Eren Goktas[3], Muhammed Nurullah Bulut[3]

[1]Departmant of Ophtalmolgy, Umraniye Research and Training Hospital, Istanbul 34766, Turkey; [2]Departmant of Ophtalmolgy, Haydarpasa Numune Research and Training Hospital, Istanbul 34668, Turkey; [3]Departmant of Ophtalmolgy, Kartal Dr. L. Kirdar Research and Training Hospital, Istanbul 34890, Turkey

Correspondence to: Umit Calli. Departmant of Ophtalmolgy, Umraniye Research and Training Hospital, Istanbul 34766, Turkey. umitcalli52@hotmail.com

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后囊膜混浊及其治疗对 SD-OCT 测量视网膜神经纤维层厚度的影响

Umit Calli[1], Taha Ayyildiz[2], Genc Selim[3], Eren Goktas[3], Muhammed Nurullah Bulut[3]

(作者单位:[1]土耳其,伊斯坦布尔 34766,Umraniye 研究培训医院,眼科; [2]土耳其,伊斯坦布尔 34668,Haydarpasa Numune 研究培训医院,眼科; [3]土耳其,伊斯坦布尔 34890,Kartal Dr. L. Kirdar 研究培训医院,眼科)

通讯作者:Umit Calli. umitcalli52@hotmail.com

摘要

目的:研究后囊膜混浊(posterior capsular opacity, PCO)及其治疗对使用谱域光学相干断层扫描(spectral domain optical coherence tomography, SD-OCT)测量视网膜神经纤维层(retinal nerve fiber layer, RNFL)厚度的影响。

方法:使用 SD-OCT 测量 50 例接受 Nd: YAG 激光后囊膜切开术患者术前和术后 RNFL 厚度。通过信噪比(signal to noise ratio, SNR)等级,将患者分为组 1(SNR 3 和 4)、组 2(SNR 5 和 6)及组 3(SNR 7 和 8)。对侧眼作为对照组。

结果:接受了 Nd: YAG 激光后囊膜切开术的眼 BCVA、SNR 和 RNFL 均值显著增加。组 1 和组 2 激光治疗前后 BCVA、SNR 和 RNFL 均值显著不同。尽管组 3 中患者治疗前后 BCVA 和 SNR 均值显著不同,RNFL 厚度在治疗前后没有显著差异。

结论:PCO 对 OCT 图像质量有影响。所有接受后囊膜切开术的患者,术后 SNR 较术前有所改善。治疗前 SNR7 在以下的患者中,RNFL 厚度在患者接受 Nd: YAG 激光后囊膜切开术后显著提高。

关键词:囊膜混浊;神经纤维;激光;固态;光学相干断层成像;后囊膜切开术

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Abstract

• AIM: To investigate the influence of posterior capsular opacity (PCO) and its removal on retinal nerve fiber layer (RNFL) thickness measured with spectral domain optical coherence tomography (SD-OCT).

• METHODS: Fifty patients underwent RNFL measurements using SD-OCT before and after Nd: YAG laser posterior capsulotomy. The patients were divided into groups according to the value of signal to noise ratio (SNR) measured by SD-OCT as group 1: SNR 3 and 4, group 2: SNR 5 and 6 and group 3: SNR 7 and 8. The other eye served as control (control group).

• RESULTS: The mean BCVA, SNR and RNFL measurements significantly increased in eyes underwent Nd: YAG laser capsulotomy. The preoperative and postoperative mean BCVA, SNR and RNFL measurements were significantly different in group 1 and group 2. Although the preoperative and postoperative mean BCVA and SNR were significantly different, the preoperative and postoperative RNFL thickness weren't significantly different in group 3.

• DISCUSSION: PCO has an influence on OCT image quality. SNR improved in all cases after removal of the PCO. However, RNFL thickness significantly improved after Nd:YAG laser capsulotomy in patients with preoperative SNR under 7.

• KEYWORDS: capsule opacification; nerve fibers; lasers, solid - state; optical coherence tomography; posterior capsulotomy

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INTRODUCTION

Optical coherence tomography (OCT) is a non-invasive imaging technique used to measure retinal and peripapillary retinal nerve fiber layer (RNFL) thickness[1]. RNFL thickness measured by OCT can be used to differentiate normal and glaucomatous eyes[2-3]. OCT is an optical measurement technique and its image quality is influenced by optic media opacifications such as cataract and vitreous opacities[4]. Cataract is the most common cause of media opacity that is known to influence the OCT image quality and measurements[5-7]. Posterior capsular opacity (PCO) is still a common delayed complication after cataract surgery[8]. A decrease in OCT image quality due to PCO may cause an underestimation of RNFL thickness measurement and can affect glaucoma diagnosis and detection of glaucoma progression using OCT. PCO has been associated with underestimated RNFL thickness in scanning laser polarimetry studies[9-10]. In another study, RNFL thickness measured by the time-domain OCT (TD-OCT) is affected by PCO[11]. The spectral-domain OCT technology (SD-OCT), has replaced the TD-OCT providing faster scan speed, improving scan resolution and potentially increased diagnostic accuracy[12-13]. There are a few studies in literature investigating the influence of PCO on macular thickness measurements using SD-OCT but the influence of PCO on RNLF measurements using SD-OCT is unclear. The purpose of this study was to evaluate the influence of PCO and its removal on the evaluation of the peripapillary RNFL as measured by SD-OCT.

SUJECTS AND METHODS

The study was conducted at the Kartal Dr. L. Kirdar Research and Training Hospital according to the principles of the Declaration of Helsinki and the local ethics committee that approved the protocol. Written informed consent was obtained from all enrolled subjects.

The subjects had visual complaints due to PCO after at least 1a from phacoemulsification and intraocularlens implantation surgery. For further evaluation, we selected patients who had normal symmetrically optic discs and cupping without any glaucomatous changes. Exclusion criteria were spherical refractive error higher than ±5 diopters, astigmatism higher than ±3 diopters, any active or past retinal pathologies (including diabetic retinopathy, age-related macular degeneration, vascular occlusions), history of ocular surgery (except for uncomplicated cataract surgery), ocular opacities except for PCO.

Subjects underwent the following examinations before and 1wk after neodymium: yttrium-aluminium-garnet (Nd:YAG) laser posterior capsulotomy, a review of medical and ophthalmic history and a detailed ophthalmic examination including manifest refraction, best corrected visual acuity (BCVA), intraocular pressure (IOP) by Goldmann applanation, slit-lamp biomicroscopy and fundus examination. Visual acuity was originally measured with Snellen charts and converted into logMAR. PCO was diagnosed using slit-lamp examination after pupil dilation by tropicamide 1% and phenylephrine 2.5%. All subjects underwent RNFL assessment with the SD-OCT (OCT/SLO OPKO/OTI, Ophthalmic Technologies Inc, Toronto, Canada) before and 1wk after Nd:YAG laser posterior capsulotomy, by a single, experienced technician. Image quality on the SD-OCT/SLO OTI is determined by signal to noise ratio (SNR) parameter (1 to 10) and the stronger the OCT signal, the higher the SNR value. The patients with PCO were divided into groups according to the value of SNR measured by SD-OCT as group 1: SNR 3 and 4, group 2: SNR 5 and 6 and group 3: SNR 7 and 8. PCO grading was performed based on dilated slitlamp findings and fundus red reflex as follows: grade 1 (no or slight PCO); grade 2 (mild PCO); grade 3 (moderate PCO); and grade 4 (severe PCO) and Nd:YAG laser posterior capsulotomy was performed on patients who were evaluated at grade 2 PCO and reported visual complaints.

The procedure was performed by the same surgeon (Calli U) under topical anesthesia (proparacaine). The pupil dilation was obtained by the use of tropicamide 1% and phenylephrine 2.5%. A 4 to 5mm posterior capsulotomy was performed using the ophthalmic Nd:YAG laser (LightMed, Taipei, Taiwan, China) with Abraham capsulotomy contact lenses. The single bursts were performed starting at 1.2 mJ and were gradually increased in power until a 4 to 5 mm circular capsular opening was obtained. Topical nepafanac drop was administered for 1wk after laser capsulotomy.

Statistical Analysis All statistical analyses were performed using statistical software (SPSS for Windows, Version 22.0; SPSS, Chicago, IL, USA). Paired t-test, independent t-test or analysis of variance (ANOVA) were used to compare parameters as appropriate. The Pearson correlation test was used to detect the association between RNFL thickness and SNR. P-values less than 0.05 were considered statistically significant.

RESULTS

Fifty eyes of fifty patients whose mean age 66.96±9.36y including 28 (56%) male and 22 (44%) female underwent Nd:YAG laser capsulotomy. The other eye served as control (control group). The other eyes of patients were pseudophakic without PCO in 26 patients and phakic without cataract in 24 patients. The preoperative and postoperative mean BCVA, SNR and RNFL measurements are shown in Table 1 and Table 2 for both eyes of patients.

The mean BCVA, SNR and RNFL measurements were significantly different between two eyes before ND:YAG laser capsulotomy (Table 1). There was no significantly difference between two eyes after the procedure (Table 2).

The mean BCVA, SNR and RNFL measurements significantly increased in eyes underwent to Nd:YAG laser capsulotomy (Table 3).

The preoperative and postoperative mean BCVA, SNR and RNFL measurements were significantly different in group 1 (SNR 3 and 4) and group 2 (SNR 5 and 6). While the preoperative and postoperative mean BCVA, SNR and symmetry were significantly different; the preoperative and postoperative RNFL thickness weren't significantly different in group 3 (SNR 7 and 8) (Table 4).

There was a significant correlation between prelaser mean BCVA and prelaser SNR ($P<0.001$, $r=-0.885$), mean RNFL thickness ($P<0.001$, $r=-0.575$) and increase in mean RNFL thickness ($P<0.001$, $r=0.556$). Also, there was a significant correlation between prelaser SNR and prelaser mean RNFL thickness ($P<0.001$, $r=0.570$ and increase in mean RNFL thickness ($P<0.001$, $r=-0.627$). No significant correlation was found between postlaser SNR, BCVA and mean RNFL thickness ($P>0.05$ for all comparison).

Table 1 BCVA, SNR and RNFL measurements before Nd: YAG laser capsulotomy

Parameters	Studied eyes	Control eyes	P^a
BCVA (logMAR)	0.57±0.26	0.05±0.06	<0.001
SNR	5.48±1.37	8.28±0.67	<0.001
Mean RNFLT (μm)	98.7±13.3	106.7±11.4	<0.001
Superior quadrant RNFLT (μm)	120.2±20.2	126±11.9	0.001
Inferior quadrant RNFLT (μm)	119.3±19.8	130.3±20.6	0.027
Temporal quadrant RNFLT (μm)	80.7±17.3	91.2±13.4	0.004
Nasal quadrant RNFLT (μm)	76.4±18.4	81.5±16.2	0.02
Symmetry (%)	71.3±11.1		

BCVA: Best corrected visual acuity; RNFLT: Retinal nerve fiber layer thickness; SNR: Signal to noise ratio; [a] Indipendent t - test; Symmetry: Interocular RNFLT symmetry.

Table 2 BCVA, SNR and RNFL measurements after Nd: YAG laser capsulotomy

Parameters	Studied eyes	Control eyes	P^a
BCVA (logMAR)	0.06±0.07	0.05±0.06	0.363
SNR	8.68±0.68	8.28±0.67	0.190
Mean RNFLT (μm)	103.8±9.9	106.6±10.8	0.100
Superior quadrant RNFLT (μm)	123.5±16.8	126.2±10.8	0.145
Inferior quadrant RNFLT (μm)	124.7±17.1	129.9±18.7	0.191
Temporal quadrant RNFLT (μm)	86.8±11	92.1±13.4	0.455
Nasal quadrant RNFLT (μm)	84.9±8.7	81.3±16.8	0.575
Symmetry (%)	83.7±4.4		

BCVA: Best corrected visual acuity; RNFLT: Retinal nerve fiber layer thickness; SNR: Signal to noise ratio; [a] Indipendent t - test; Symmetry: Interocular RNFLT symmetry.

Table 3 BCVA, SNR and RNFL measurements changes after Nd: YAG laser capsulotomy in eyes underwent procedure

Parameters	Prelaser	Postlaser	P^a
BCVA (logMAR)	0.57±0.26	0.06±0.07	<0.001
SNR	5.48±1.37	8.68±0.68	<0.001
Mean RNFLT (μm)	98.7±13.3	104.8±9.9	<0.001
Superior quadrant RNFLT (μm)	120.2±20.2	125.5±16.8	<0.001
Inferior quadrant RNFLT (μm)	119.3±19.8	122.5±17.1	0.03
Temporal quadrant RNFLT (μm)	80.7±17.3	88.8±11	<0.001
Nasal quadrant RNFLT (μm)	76.4±18.4	82.8±8.7	<0.001
Symmetry (%)	71.3±11.1	83.7±4.4	<0.001

BCVA: Best corrected visual acuity; RNFLT: Retinal nerve fiber layer thickness; SNR: Signal to noise ratio; [a] Paired t-test; Symmetry: Interocular RNFLT symmetry.

Table 4 BCVA, SNR and RNFL measurements changes after Nd: YAG laser capsulotomy in eye underwent procedure for each group

Parameters	Prelaser	Postlaser	P^a
Group 1 (n=12)			
BCVA (logMAR)	0.95±0.23	0.05±0.05	<0.001
SNR	3.5±0.52	8.1±0.4	<0.001
Mean RNFL (μm)	90.7±10.7	104.2±8.4	0.007
Superior quadrant RNFLT (μm)	112.2±20.2	121.5±13.7	0.018
Inferior quadrant RNFLT (μm)	113.7±18.1	116.7±21.9	0.032
Temporal quadrant RNFLT (μm)	69.7±6.3	95.5±26.4	0.044
Nasal quadrant RNFLT (μm)	69.3±13.1	84.2±3.8	0.038
Symmetry (%)	61.4±11.5	84.6±4.1	<0.001
Group 2 (n=26)			
BCVA (logMAR)	0.49±0.09	0.06±0.04	<0.001
SNR	5.65±0.48	8.5±0.4	<0.001
Mean RNFL (μm)	98.4±14.1	102.9±11.5	<0.001
Superior quadrant RNFLT (μm)	120.2±14.6	123.8±19.8	0.024
Inferior quadrant RNFLT (μm)	118.5±23.5	123.3±16.6	<0.001
Temporal quadrant RNFLT (μm)	83.1±19.7	84.1±9.1	0.078
Nasal quadrant RNFLT (μm)	74.6±19.1	80.2±10.5	<0.001
Symmetry (%)	73.5±10.5	84.6±4.1	<0.001
Group 3 (n=12)			
BCVA (logMAR)	0.35±0.12	0.06±0.06	<0.001
SNR	7.1±0.66	9.4±0.5	<0.001
Mean RNFLT (μm)	107.2±8.2	109.3±5.4	0.707
Superior quadrant RNFLT (μm)	128.2±14.6	133.4±5.5	0.181
Inferior quadrant RNFLT (μm)	126.7±10.4	126.8±9.9	0.955
Temporal quadrant RNFLT (μm)	86.4±16.4	92.2±12.6	0.432
Nasal quadrant RNFLT (μm)	87.7±3.4	87.1±7.8	0.675
Symmetry (%)	76.5±4.4	81.1±3.6	<0.001

BCVA: Best corrected visual acuity; RNFLT: Retinal nerve fiber layer thickness; SNR: Signal to noise ratio; [a] Paired t-test; Symmetry: Interocular RNFLT symmetry.

DISCUSSION

Cataract and glaucoma often coexist in the same eye and also cataract is the most common cause of media opacity that is known to effect the OCT image quality. It has been demonstrated that RNFL thickness measurements are effected by cataract and its removal and also more advanced cataracts are associated with less signal quality and thinner recorded RNFL thickness[5-7,14]. Many glaucoma patients undergoing cataract surgery due to developing cataract and despite the development of the modern phacoemulsification techniques, introduction of sharp-edge optic intraocular lenses (IOL) and new biomaterials have resulted in reduced rates; PCO is still the most common problem following cataract surgery[15-16]. The effect of PCO and its removal on OCT image quality and macular thickness measurements by TD-OCT and also SD-OCT have been investigated in previous studies. Altiparmak *et al*[17] showed that SNR increased significantly but no changes observed on foveal thickness using TD-OCT in 54 patients after Nd: YAG laser capsulotomy. Similarly, Gonzalez-Ocampo-Dorta *et al*[18] showed that Nd: YAG laser capsulotomy results in a measurable increased in signal strength (SS) but no significant difference was observed on macular retinal thickness measurements using TD-OCT in 32 patients. In another study, Ruiz-Casas *et al*[19] showed that macular thickness has not been seen to change after ND: YAG laser capsulotomy using SD-OCT in 31 patients. Similarly, Cagini *et al*[20] observed that there is no significant differences between mean preoperative and postoperative retinal thickness and total macular volume measurements, neither with TD-OCT nor with SD-OCT. Also their study confirmed that PCO has a strong negative influence on the quality of OCT acquisition, and examination is reliable only when it is possible to acquire good quality images with TD-OCT but with new generation SD-OCT, tomographic acquisitions are always reliable and are not influenced by the presence of PCO.

Kara *et al*[11] recently investigated the effect of PCO and its removal on OCT image quality (SS) and peripapillary RNFL thickness measurements using TD-OCT in 89 patients. They observed that RNFL thickness measurements are affected by PCO and RNFL thickness may be underestimated in eyes with preoperative PCO grades higher than 2 and in eyes with preoperative SS lower than 7.

SD-OCT have greater reproducibility and higher resolution. Nonetheless, the influence of PCO and its removal on the evaluation of RNFL by SD-OCT is not clear. In this study, we investigated the influence of PCO on evaluation of RNFL and SNR as measured by SD-OCT.

BCVA, SNR and RNFL measurements, which were significantly lower in eyes with PCO compared to other eyes of patients (phakic without cataract or pseudophakic without PCO) before Nd: YAG laser capsulotomy, significantly decreased after the procedure and there was no significantly difference between eyes after Nd: YAG laser capsulotomy. We also observed that preoperative and postoperative BCVA, SNR and RNFL measurements are significantly different in group 1 (SNR 3 and 4) and group 2 (SNR 5 and 6). While preoperative and postoperative BCVA and SNR are significantly different, preoperative and postoperative RNFL measurements aren't significantly different in group 3 (SNR 7 and 8). Prelaser mean BCVA and SNR were found correlated with prelaser mean RNFL thickness and increase in mean RNFL thickness.

This study showed that PCO has an influence on OCT image quality. SNR improved in all cases after removal of the PCO. However, RNFL thickness significantly improved after Nd: YAG laser capsulotomy in patients with preoperative SNR under 7. Clinically, these patients may be misdiagnosed as having glaucoma, glaucomatous progression. RNFL thickness, measured by SD-OCT, are affected by PCO. This effect may be associated with reduced SNR secondary to increased light scattering by PCO. It may result in RFNL measurements tending to be underestimated in eyes with preoperative SNR less than 7. If a clinically significant PCO is detected, new measurements should be considered after PCO removal.

In conclusion, a decrease in OCT image quality, such as that observed in patients with PCO, may cause an underestimation of RNFL thickness measurements and will affect glaucoma diagnosis and detection of glaucoma progression using SD-OCT.

REFERENCES

1 Jaffe GJ, Caprioli J. Optical coherence tomography to detect and manageretinal disease and glaucoma. *Am J Ophthalmol* 2004;137(1):156-169

2 Wong JJ, Chen TC, Shen LQ, Pasquale LR. Macular imaging for glaucoma using spectral-domain optical coherence tomography: a review. *Semin Ophthalmology* 2012;27(5-6):160-166

3 Bengtsson B, Andersson S, Heijl A. Performance of time-domain and spectral-domain optical coherence tomography for glaucoma screening. *Acta Ophthalmol* 2012;90(4):310-315

4 van Velthoven ME, Faber DJ, Verbraak FD, van Leeuwen TG, de Smet MD. Recent developments in optical coherence tomography for imaging the retina. *Prog Retin Eye Res* 2007;26(1):57-77

5 El-Ashry M, Appaswamy S, Deokule S, Pagliarini S. The effect of phacoemulsification cataract surgery on the measurement of retinal nerve fiber layer thickness using optical coherence tomography. *Curr Eye Res* 2006;31(5):409-413

6 Savini G, Zanini M, Barboni P. Influence of pupil size and cataract on retinal nerve fiber layer thickness measurements by Stratus OCT. *J Glaucoma* 2006;15(4):336-340

7 Mwanza JC, Bhorade AM, Sekhon N, McSoley JJ, Yoo SH, Feuer WJ, Budenz DL. Effect of cataract and its removal on signal strength and peripapillary retinal nerve fiber layer optical coherence tomography measurements. *J Glaucoma* 2011;20(1):37-43

8 Varga A, Sacu S, Vécsei-Marlovits PV, Richter-Mueksch S, Neumayer T, Weingessel B, Findl O, Schmidt-Erfurth U. Effect of posterior capsuleopacification on macular sensitivity. *J Cataract Refract Surg* 2008;34(1):52-56

9 Garcia-Medina JJ, Garcia-Medina M, Zanon-Moreno VC, Gallego-Pinazo R, Pons-Vazquez S, Gonzalez-Ocampo S, Pinazo-Durán MD. The influence of posterior capsular opacification removal on anterior segment birefringence parameters as measured by scanning laser polarimetry. *Clin Exper Ophthalmol* 2007;35(5):414-20

10 Brittain CJ, Fong KC, Hull CC, Gillespie IH. Changes in scanning laser polarimetry before and after laser capsulotomy for posterior capsular opacification. *J Glaucoma* 2007;16(1):112-116

11 Kara N, Altinkaynak H, Yuksel K, Kurt T, Demirok A. Effects of posterior capsular opacification on the evaluation of retinal nerve fiber layer as measured by stratus optical coherence tomography. *Can J Ophthalmol* 2012;47(2):176-180

12 Kim NR, Kim JH, Kim CY, Jun I, Seong GJ, Lee ES. Comparison of the optic nerve imaging by time-domain coherence tomography and Fourier-domain optical coherence tomography in distinguishing normal eyes from those with glaucoma. *J Glacuoma* 2013;22(1):36-43

13 Sehi M, Grewal DS, Sheets CW, Greenfield DS. Diagnostic ability of fourier-domain *vs* time-domain optical coherence tomography for glaucoma detection. *Am J Ophthalmol* 2009;148(4):597-605

14 Sánchez-Cano A, Pablo LE, Larrosa JM, Polo V. The effect of phacoemulsification cataract surgery on polarimetry and tomography measurements for glaucoma diagnosis. *J Glaucoma* 2010;19(7):468-474

15 Buehl W, Findl O. Effect of intraocular lens design on posterior capsuleopacification. *J Cataract Refract Surg* 2008;34(11):1976-85

16 Findl O, Buehl W, Bauer P, Sycha T. Interventions for preventing posterior capsule opacification. *Cochrane Database of Systematic Reviews* 2007;(3):CD003738

17 Altiparmak UE, Ersoz I, Hazirolan D, Koklu B, Kasim R, Duman S. The impact of Nd:YAG capsulotomy on foveal thickness measurement by optical coherence tomography. *Ophthalmic Surgery Lasers and Imaging* 2010;41(1):67-71

18 Gonzalez-Ocampo-Dorta S, Garcia-Medina JJ, Feliciano-Sanchez A, Scalerandi G. Effect of posterior capsular opacification removal on macular optical coherence tomography. *Eur J Ophthalmol* 2008;18(3):435-441

19 Ruiz-Casas D, Barrancos C, Alio JL 2nd, Ruiz-Guerrero M, Muñoz-Negrete FJ. Effect of posterior neodymium: YAG capsulotomy. Safety evaluation of macular foveal thickness, intraocular pressure and endothelial cell loss in pseudophakic patients with posterior capsule opacification. *Arch Soc Esp Oftalmol* 2013;88(11):415-422

20 Cagini C, Pietrolucci F, Lupidi M, Messina M, Piccinelli F, Fiore T. Influence of pseudophakic lens capsule opacification on spectral domain and time domain optical coherence tomography image quality. *Curr Eye Res* 2015;40(6):579-584