

# Evaluation of choroidal thickness changes after phacoemulsification surgery

Salih Uzun<sup>1</sup>  
Emre Pehlivan<sup>2</sup>

<sup>1</sup>Department of Ophthalmology,  
Etimesgut Military Hospital, Ankara,

<sup>2</sup>Department of Ophthalmology,  
Eskisehir Military Hospital,  
Eskisehir, Turkey

## Dear editor

We have read and reviewed the article entitled as “Evaluation of choroidal thickness changes after phacoemulsification surgery” by Bayhan et al<sup>1</sup> with great interest. The authors had analyzed the effects of phacoemulsification surgery on choroidal thickness (CT) using optical coherence tomography by postoperative month 1. They had found that there were statistically significant increases in all CT measurements, particularly in subfoveal and nasal areas, and the increase in CT was correlated with postoperative decrease of postoperative intraocular pressure. We express our gratitude to the authors for this valuable study, and we would like to ask the authors some important points.

Although there is not a full consensus between Bayhan et al and other studies in the literature concerning the effects of cataract surgery on CT, an increase in CT has been reported. Various studies have proposed that the increase in CT might be induced by inflammatory changes following cataract surgery and decreased postoperative intraocular pressure.<sup>2,3</sup>

In the study of Bayhan et al, we suppose that there was a different reason for increased postoperative CT, particularly for the one observed in the subfoveal area. As it is well known, the sharpest area of vision is the fovea, and the choroid beneath foveal area is called subfoveal choroid. Decreased visual function due to cataract may cause metabolic slowdown and subfoveal thinning. Synchronously, the choroid supporting that area may get thin in parallel with reduced metabolic demand of fovea. We suggest that this state may be related to the atrophy of unused organs. Therefore, we predict that an additional analysis regarding the correlation of preoperative visual acuity with preoperative CT may clarify that issue. In this regard, we would like to ask for the authors’ opinion.

Second, it has been suggested in the literature that CT may be utilized for assessing the diagnosis, outcomes, and follow-up of numerous local or systemic diseases.<sup>4,5</sup> However, all these studies have revealed quite different and conflicting results. It has been well known that dozens of factors including menstrual cycle, psoriasis, systemic medicines, and lighting conditions of the environment where optical coherence tomography measurements are performed may influence CT.<sup>4,5</sup> Therefore, all of the known factors affecting CT or possible factors that may affect CT should be standardized in studies concerning CT measurements. In this way, an accurate scientific analysis may be performed.

Correspondence: Salih Uzun  
Etimesgut Asker Hastanesi Goz  
Hastalıkları Servisi, 06790 Etimesgut,  
Ankara, Turkey  
Tel +90 50 6386 3151  
Fax +90 31 2321 3472  
Email s.uzun84@gmail.com

## Disclosure

None of the authors have a financial or proprietary interest in any material or method mentioned, and there was no public or private support. The authors report no conflicts of interest in this communication.

---

## References

1. Bayhan SA, Bayhan HA, Muhafiz E, Kirboğa K, Gürdal C. Evaluation of choroidal thickness changes after phacoemulsification surgery. *Clin Ophthalmol*. 2016;10:961–967.
2. Jones J, Francis P. Ophthalmic utility of topical bromfenac, a twice-daily nonsteroidal anti-inflammatory agent. *Expert Opin Pharmacother*. 2009;10(14):2379–2385.
3. Xu H, Chen M, Forrester JV, Lois N. Cataract surgery induces retinal pro-inflammatory gene expression and protein secretion. *Invest Ophthalmol Vis Sci*. 2011;52(1):249–255.
4. Tan KA, Gupta P, Agarwal A, et al. State of science: choroidal thickness and systemic health. *Surv Ophthalmol*. Epub 2016 Mar 12.
5. Nickla DL, Wallman J. The multifunctional choroid. *Prog Retin Eye Res*. 2010;29(2):144–168.

## Authors' reply

Seray Aslan Bayhan  
Hasan Ali Bayhan  
Ersin Muhafiz  
Kadir Kırboğa  
Canan Gürdal

Department of Ophthalmology, Faculty of Medicine, Bozok University, Yozgat, Turkey

Correspondence: Seray Aslan Bayhan  
Department of Ophthalmology, Faculty of Medicine, Bozok University,  
Adnan Menderes Street, Yozgat 66200, Turkey  
Email seraybayhan@hotmail.com

## Dear editor

We appreciate Doctors Uzun and Pehlivan for their comments on our recently published study, in which we analyzed the effects of phacoemulsification surgery on choroidal thickness (CT) using optical coherence tomography by postoperative month 1. We evaluated our data regarding the correlation of preoperative visual acuity with preoperative CT retrospectively to reply to their comments and found no correlation.

It has long been held that, in contrast to the retina and anterior uvea, the choroidal blood flow does not exhibit auto-regulation. The purported reason is that the high choroidal blood flow and low oxygen extraction preclude the need for it.<sup>1</sup> Thus, choroidal blood flow is expected to be much more than the metabolic demand not only in cataractous eyes but also in normal eyes. However, this is still the subject of debate. We hope that these speculations on the mechanisms will be addressed by further studies in the future.

The authors comment on the factors that influence the thickness of choroid, an approach with which we agree. In the literature, several factors including diurnal variation, age, sex, axial length, and smoking were reported to affect the CT.<sup>2,3</sup> Because of this, we used strict exclusion criteria: patients with diabetes mellitus, hypertension, dyslipidemia or any known systemic diseases, uveitis, glaucoma, retinal vein/branch occlusion, or other vascular and inflammatory retinal diseases and previous eye surgery were excluded from the study due to the effect on CT. Smoking was an exclusion criterion as well. Also, OCT measurements were obtained in the morning (between 9 am and 11 am) in order to avoid the effect of diurnal fluctuations.

We thank the editor for the opportunity to address the comments and concerns raised by Doctors Uzun and Pehlivan.

## Disclosure

The authors report no conflicts of interest in this communication.

## References

1. Nickla DL, Wallman J. The multifunctional choroid. *Prog Retin Eye Res.* 2010;29(2):144–168.
2. Goldenberg D, Moisseiev E, Goldstein M, Loewenstein A, Barak A. Enhanced depth imaging optical coherence tomography: choroidal thickness and correlations with age, refractive error, and axial length. *Ophthalmic Surg Lasers Imaging.* 2012;43(4):296–301.
3. Usui S, Ikuno Y, Akiba M, et al. Circadian changes in subfoveal choroidal thickness and the relationship with circulatory factors in healthy subjects. *Invest Ophthalmol Vis Sci.* 2012;53(4):2300–2307.

Dove Medical Press encourages responsible, free and frank academic debate. The content of the Clinical Ophthalmology 'letters to the editor' section does not necessarily represent the views of Dove Medical Press, its officers, agents, employees, related entities or the Clinical Ophthalmology editors. While all reasonable steps have been taken to confirm the content of each letter, Dove Medical Press accepts no liability in respect of the content of any letter, nor is it responsible for the content and accuracy of any letter to the editor.

### Clinical Ophthalmology

## Publish your work in this journal

Clinical Ophthalmology is an international, peer-reviewed journal covering all subspecialties within ophthalmology. Key topics include: Optometry; Visual science; Pharmacology and drug therapy in eye diseases; Basic Sciences; Primary and Secondary eye care; Patient Safety and Quality of Care Improvements. This journal is indexed on

Submit your manuscript here: <http://www.dovepress.com/clinical-ophthalmology-journal>

Dovepress

PubMed Central and CAS, and is the official journal of The Society of Clinical Ophthalmology (SCO). The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.