



## Corneal, Scleral, Choroidal, and Foveal Thickness in Patients with Rheumatoid Arthritis

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Dear Editor,

We congratulate Gökmen et al.<sup>1</sup> for their paper evaluating corneal, scleral, choroidal, and foveal thickness in patients with rheumatoid arthritis (RA). While the authors found that female patients with RA had a thinner sclera compared to healthy subjects, there was no difference for corneal, choroidal and foveal thickness.

Assessment of the choroid is important because it provides nutrition to the outer retinal structures and hence plays a role in many chorioretinal diseases. While the authors did not find any statistical difference in choroidal thicknesses between the two groups, those with RA were noted to have consistently thicker choroids in all measurements points except at 3 mm nasally. This trend may be interesting.

The authors obtained the choroidal thickness by averaging measurements taken at seven specific points. However, the choroid is a three-dimensional structure with considerable topographic variation.<sup>2,3</sup> Measuring the mean choroidal thickness in different regions of the macula by manual segmentation of the choroid-scleral interface may potentially yield interesting findings.

Similarly, this is a potential consideration when assessing retinal thickness. The authors used the central foveal thickness, which was measured manually from the internal limiting membrane to the retinal pigment epithelium at the fovea. An alternative would be to assess the central subfield retinal thickness using the automated segmentation provided by the proprietary software on Optical Coherence Tomography devices.<sup>4</sup> It has also been shown that the central retinal thickness has less variability than the central point thickness.<sup>5</sup>

In summary, the authors presented interesting findings of a thinner sclera in patients with RA as compared to healthy subjects. The use of choroidal segmentation technique and central retinal thickness may enhance the evaluation of the respective anatomical structures in future studies.

**Keywords:** Rheumatoid arthritis, scleral thickness, corneal thickness, choroidal-retinal thickness, optical coherence tomography

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### Authorship Contributions

Literature Search: Kelvin Z. Li, Colin S. Tan, Writing: Kelvin Z. Li, Colin S. Tan.

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## Response from the Authors

### Dear Editor,

We are happy to receive a letter concerning our study about corneal, scleral, choroidal, and foveal thickness in patients with rheumatoid arthritis (RA) and we thank Li and Tan for their positive contributions to our study.

In our study we used the single-slice manual segmentation technique around the fovea; however, rheumatoid arthritis is a systemic disease and systemic diseases may affect not only the macula, but all retinal and choroidal vascular structures. Perhaps in the near future, newly developed devices may enable wide-field automated choroidal measurements, thus providing a better understanding of the topographic variations of the three-dimensional vascular structure of the choroid.

For scleral measurements we used time domain optical coherence tomography (OCT) with a 45-degree temporal gaze at one point, but laser penetration of the sclera was significantly lower than retina or choroid, which affects resolution of the uvea-scleral junctional image. However, using swept source anterior segment OCT provides much better image quality and the combination of ultrasound biomicroscopy at multiple points may yield higher quality images and data.<sup>1,2</sup>

We concur with Li and Tan regarding automatic segmentation in retinal thickness measurements. The central macula can now

be evaluated using OCT automated segmentation mapping, similar to retinal measurements, and choroidal thickness can also be measured with Early Treatment Diabetic Retinopathy Study subfield segmentations.<sup>3</sup> However, using the line-field or wide-field modalities of swept source OCT may also better evaluate the anatomical structures of the choroid and retina in future studies.<sup>4,5</sup>

Best Regards,

Onur Gökmen, Ahmet Akman, Sirel Gür Güngör

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