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Author Response to Letter

Early Ganglion Cell or Macular Vessel Loss After Acute Nonarteritic Anterior Ischemic Optic Neuropathy?

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Dear Editor:

We have read with enthusiasm the comments by Rebolleda et al.[1] and thank them for their interest in our published article.[2]

In their letter, these authors focused primarily on the timing of ganglion cell inner plexiform layer (GCIPL) thinning after acute nonarteritic anterior ischemic optic neuropathy (NAION). As they cited, we did not find GCIPL thinning at the initial presentation of acute NAION using Heidelberg Spectralis optical coherence tomography (OCT) (Heidelberg Engineering, Heidelberg, Germany) at 3- and 6-mm macular scan diameters, which also permits manual correction of any GCIPL segmentation errors.[3] However, after 1 month, we observed 28.7-mm loss of thickness in the inner 3-mm GCIPL and 12.1-mm loss in the outer 6-mm GCIPL.[3] In contrast, De Dompablo et al.[4] reported that NAION eyes had significant thinning of GCIPL minimum (GCIPL min) as early as 2.2 days after symptom onset using Cirrus-OCT, in which GCIPL measures an elliptical annulus (outer radius of 2 and 2.4 mm) around the fovea. In addition to the differences in the methods and areas of measurement between two studies, in their study, "mean" GCIPL thickness in NAION eyes was still not statistically thinner at first presentation and even at 2 weeks. As they mentioned, only GCIPL min was statistically thinner at first presentation, which is not measured by Spectralis OCT.

Furthermore, another prospective study evaluated 29 acute NAION eyes with Cirrus OCT for 6 months using the three dimensional layer segmentation (method 1) and a commercial proprietary software (method 2), to compute the GCIPL thickness.[5] At presentation, method 1 showed no significant thinning of GCIPL thickness in eyes with NAION compared with normal fellow eyes with a mean value of 80 μm, similar to our report. GCIPL thickness appeared reduced by the commercial method to 66.8 μm. That study concluded that the apparent erroneous GCIPL reduction by method 2 at presentation in some patients stemmed from segmentation errors due to severe disc swelling that distorted normal retinal layer architecture.[5]

If we carefully look at two examples of NAION in De Dompablo et al.,[4] we find that the first NAION with very high peripapillary retinal nerve fiber layer thickness and severe disc edema shows thinner GCIPL than the other one with milder disc edema using commercial Cirrus software.

Regarding their OCT-angiography (OCT-A) study, we congratulate them for their prospective study of six NAION eyes at both acute and atrophic stages, which is in contrast to our cross sectional study at the acute stage.[6]

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References

1. Rebolleda G, Díez-Álvarez L, De Dompablo E, Muñoz-Negrete FJ. Early macular vessel density loss in acute ischemic optic neuropathy compared to papilledema: implications for pathogenesis. *Trans Vis Sci Tech*. 2019;8:6.
2. Fard MA, Ghahvechian H, Sahrayan A, Subramanian PS. Early macular vessel density loss in acute ischemic optic neuropathy compared to

papilledema: implications for pathogenesis. *Trans Vis Sci Tech*. 2018;7:10.
3. Akbari M, Abdi P, Fard MA, et al. Retinal ganglion cell loss precedes retinal nerve fiber thinning in nonarteritic anterior ischemic optic neuropathy. *J Neuroophthalmol*. 2016;36:141–146.
4. De Dompablo E, García-Montesinos J, Muñoz-Negrete FJ, Rebolleda G. Ganglion cell analysis at acute episode of nonarteritic anterior ischemic optic neuropathy to predict irreversible damage. A prospective study. *Graefes Arch Clin Exp Ophthalmol*. 2016;254:1793–1800.
5. Kupersmith MJ, Garvin MK, Wang JK, Durbin M, Kardon R. Retinal ganglion cell layer thinning within one month of presentation for non-arteritic anterior ischemic optic neuropathy. *Invest Ophthalmol Vis Sci*. 2016;57:3588–3593.
6. Rebolleda G, Díez-Álvarez L, García Marín Y, de Juan V, Muñoz-Negrete FJ. Reduction of peripapillary vessel density by optical coherence tomography angiography from the acute to the atrophic stage in non-arteritic anterior ischaemic optic neuropathy. *Ophthalmologica*. 2018; 26:1–9.