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Re: Hou et al.: Integrating macular ganglion cell inner plexiform layer and parapapillary retinal nerve fiber layer measurements to detect glaucoma progression

(*Ophthalmology*. 2018;125:822-831)

TO THE EDITOR: We read with interest the article by Hou et al.[1] Attempts to integrate both parapapillary retinal nerve fiber layer (RNFL) and macular ganglion cell inner plexiform layer (GCIPL) guided progression analysis (GPA) results, and to investigate the temporal relationship between them are interesting and necessary for understanding glaucoma progression.

However, we would like to make a few comments on the methodology by which authors defined the spatial correspondence between progressive RNFL thinning and progressive GCIPL thinning to evaluate the temporal relationship. The definition of the zone simply in both superior and inferior hemiretina, as shown in this study, may be limited. How did authors assess spatial correspondence if the glaucoma progression was to occur in >1 place in GPA maps? We would like to discuss this in the presented figure in the main article.

The authors presented Figure 1A as the progressive GCIPL thinning at the superotemporal (ST) macula detected before progressive RNFL thinning at the ST optic disc region. Looking at the RNFL thickness maps, RNFL thinning at the ST optic disc region already existed at baseline and it can be hard to assert progression was detected GCIPL first, only with GPA programs. In 2013, the RNFL progression was also found in the inferoinferior region with RNFL GPA, not in the ST region. How did the authors assess spatial correspondence in this case? Each of several progression location needs to be analyzed separately.

The authors presented Figure 1B as the progressive RNFL thinning preceding progressive GCIPL thinning. However, in the case of superior hemiretina, progression was detected simultaneously from both RNFL and GCIPL GPA from January 2013. In the case of inferior hemiretina, the parapapillary sectors could be separated into macular vulnerability zone and inferoinferior region according to Hood et al.[2-4] In the inferoinferior sector, progression was detected only on RNFL GPA. Progression detected in the inferior hemiretina's GCIPL GPA would not be associated with the inferoinferior parapapillary region shown on RNFL GPA.

Although it is difficult to analyze this with methodologic complexity, it would be more helpful for the more sophisticated analyses that individual progression location would be analyzed separately, and the spatial correspondence would be determined between anatomically connected areas.

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REPLY: We thank Drs Lee and Park for their interest in our work.[1] We defined spatial correspondence between progressive retinal nerve fiber layer (RNFL) thinning and progressive ganglion cell inner plexiform layer (GCIPL) thinning whenever superior or inferior, progressive RNFL and GCIPL thinning was observed in the guided progression analysis (Methods, p. 824, Evaluation of Spatial Correspondence in Glaucoma Progression),[1] We adopted a less sophisticated approach to define spatial correspondence because of the limited scan area constrained by the OCT scan protocol for RNFL/GCIPL thickness analysis. Whereas the RNFL thickness was analyzed over the 6×6-mm optic nerve head region, the macular GCIPL thickness analysis was limited to a relatively small elliptical annulus, with inner vertical and horizontal axes of 1.0 and 1.2 mm, respectively, and outer vertical and horizontal axes of 4.0 and 4.8 mm, respectively.