**Author’s response to reviews**

**Title:** Segmentation Error in Spectral Domain Optical Coherence Tomography measures of the retinal nerve fibre layer thickness in Idiopathic Intracranial Hypertension

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**Author’s response to reviews:**

All authors would like to thank the reviewers’ time and comment in helping to improve our manuscript.

1) Please explain in the methods why you used Image J instead of the quantitative values provided by the OCT software.

   We used both; in the methods and as highlighted by the second reviewer we have made this more clear: Quantitative analysis then involved evaluating the internal limiting membrane and RNFL thickness for the presence of SegE and accordingly using the Heidelberg Eye Explorer software which automatically identifies the layer border and allows for manual correction of the segmentation.

2) Please state how many cases have been included for the comparison between independent raters and delete the word "estimated" in the results row 6
- In the methods (line before Statistics) we state: Quality assurance was undertaken with a further masked observer (JH) independently examining SegE in a quarter of the subjects in the cohort to ensure there was sufficient concordance.

To make this more transparent I have amended to:

Quality assurance was undertaken with a further masked observer (JH) independently examining SegE in a quarter (n=20) of the subjects in the cohort to ensure there was sufficient concordance.

In the results I have deleted the “estimate” as requested.

3) Please provide figure legends

Included after references.

4) Autosegmentation in neovascular AMD is incorrect in the majority of cases, thus I recommend to edit the sentence in the introduction starting with "auto segmentation has been found to..." as this suggest automated segmentation is usually correct in NVAMD.

Corrected as requested: Autosegmentation has been found to be inaccurate in some retinal pathologies such as neovascular age related macular degeneration and central serous retinopathy [5]

1. The punctuation needs rework to improve readability, there are many inconsistencies regarding

- Citation-brackets after vs. before full stop. e.g. page 5, line 12 (...papilloedema. [2] Commercially…) vs line 29 (...thickness [2-4]. Autosegmentation…)

- spaces between number and unit, e.g. page 6, line 18 "38.7kgm-2" vs "51.3 kgm-2"

- spaces before and after Hyphen, e.g. page 9, line 12 ("76 - 581µm") vs. page 9, line 14 ("83-391µm")

- At several locations the space is just missing, e.g. page 9, line 12: "...median176µm…” or page 9, line 19: "...125 µm)pre segmentation…”

- inconsistent underlining of references (page 16ff)

Thank you, we have hopefully improved in all the areas mentioned above.
2. Page 5, line 41: Please change to read "...to evaluate the extent and..." (delete "of")

Deleted as requested.

3. For statistical analysis, RNFL area was used, but in clinical routine, RNFL thickness is the usual parameter. Are the results also significant when using thickness instead of area?

For only Superior and Inferior thickness, as detailed in table 1:

<table>
<thead>
<tr>
<th></th>
<th>Maximum</th>
<th>Highest Single</th>
<th>Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superior</td>
<td>7 (0-60) 5 (0-42) 12 (0-60) 3 (0-26) 0.044* 0.017*</td>
<td>Superior 7 (0-60) 5 (0-42) 12 (0-60) 3 (0-26) 0.044* 0.017*</td>
<td>Superior 7 (0-60) 5 (0-42) 12 (0-60) 3 (0-26) 0.044* 0.017*</td>
</tr>
<tr>
<td>Nasal</td>
<td>6 (0-70) 5 (0-51) 8 (0-70) 7 (0-133) NS NS</td>
<td>Nasal 6 (0-70) 5 (0-51) 8 (0-70) 7 (0-133) NS NS</td>
<td>Nasal 6 (0-70) 5 (0-51) 8 (0-70) 7 (0-133) NS NS</td>
</tr>
<tr>
<td>Inferior</td>
<td>5 (0-96) 3 (0-114)7 (0-96) 3 (0-17) NS 0.049*</td>
<td>Inferior 5 (0-96) 3 (0-114)7 (0-96) 3 (0-17) NS 0.049*</td>
<td>Inferior 5 (0-96) 3 (0-114)7 (0-96) 3 (0-17) NS 0.049*</td>
</tr>
<tr>
<td>Temporal</td>
<td>3 (0-43) 3 (0-21) 3 (0-43) 1 (0-28) NS NS</td>
<td>Temporal 3 (0-43) 3 (0-21) 3 (0-43) 1 (0-28) NS NS</td>
<td>Temporal 3 (0-43) 3 (0-21) 3 (0-43) 1 (0-28) NS NS</td>
</tr>
</tbody>
</table>

4. Page 6, line 57: Can you explain the relevance of "absence of posterior vitreous detachment" as criterion for this study?

We included this, as other papilloedema studies have included this when looking at SegE. It may contribute to artefact error.

5. Page 7, line 41: Please change to read "...automatically identifies the layer border and allows for manual correction of the segmentation."

Changed as requested.

6. Text/detailed explanation for figure 2 and figure 3 is missing

We have included the figure legend, that was omitted at this submission.
7. Figure 3 should also show post-resegmentation-correction images

Now that the figure legend is included this helps with this point. Figure 3 shows examples of severe papilloedema that were too difficult to accurately re-segment.

9. Page 12, line 19: Please correct "in deed" to "indeed"

Changed as requested.

10. Page 12, line 22: Please correct to read "... disagree on where to draw the margins"

Changed as requested.

11. Page 12, line 56: Please add a reference regarding decreased error due to the eye tracking system

Reference 19 with regard to this was repeated in the text (two paragraphs above). I have therefore removed this sentence.

12. Page 13, line 14: Please change "it's" to "its"

Changed as requested.

13. Page 13, line 27: Figure 3 does not show the paradigm the authors mention in the text

This has been corrected to Figure 4.

14. Page 13, line 39: was -> were
15. Page 13, line 51: Please change to read "...monitoring in IIH, hence recognition…”

Changed as requested.

16. As already shown in the IIHTT study for Zeiss Cirrus OCT, from clinical experience volumetric scans are less prone to artifacts in case of severe papilloedema also for Heidelberg Spectralis OCT. I would suggest the authors provide a clear recommendation to use volume scan pattern for assessment of papilloedema in the discussion instead of merely mentioning this finding of the IIHTT only regarding Cirrus OCT (page 10, line 46).

Added as suggested (last line of discussion): However, as demonstrated with the results from the IIHTT[2] we would recommend the use of optic nerve volume scans in the routine clinical assessment of papilloedema.