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Reply:

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REPLY:

We thank Dr Alexander and colleagues for their interest in our work and appreciate the opportunity to respond to their concerns.[1]

A concern is raised regarding the interpretation of our results, which led us to conclude that our findings do not support "a different etiology" between extracranial atherosclerosis (ECAS) and intracranial atherosclerosis (ICAS). We agree with the data used to substantiate their concern, including data on histopathology and etiology, but do not share their opinion that our findings are contradictory. As described in our article—and noted by Alexander et al—there are several limitations to our study design, which is why we tried to carefully word our conclusion to avoid overinterpretation of our results. We showed that there is a relationship between ICAS and several clinical markers of ECAS, suggesting a similar etiology; or in other words (used in the article), our (limited) results do not support a different etiology. However, there are indeed differences in etiology and pathophysiology, which we do not claim to contradict. Apparently, we were not able to successfully convey this subtle difference to all readers.

As carefully described by Alexander et al, ICAS is a complex disease with many facets, and intracranial vessel wall MR imaging (vwMRI) facilitates our attempts to elucidate parts of this disease process. We agree that vwMRI can provide us with information not only on the presence or absence of atherosclerotic plaques but also on plaque components and the (from extracranial atherosclerosis) well-known "vulnerable plaque." However, most vessel wall lesions encountered in our populations, Caucasian subjects, which Alexander et al justly noted were not specifically mentioned in our article, are too small to accurately measure, let alone characterize, apart from the presence or absence of enhancement.[2] It would indeed also have been of interest to correlate vessel wall lesion locations with cerebrovascular symptoms, but this would necessitate a different study population—with more (cerebrovascular) symptomatic patients—to reach any statistically significant results.

Finally, we would like to provide our whole-hearted support for the suggestion of Alexander et al to "refocus the need for tissue validation of vwMRI." The ease of characterizing extracranial carotid atherosclerotic plaques is in stark contrast with the difficulty of performing the same analyses in intracranial plaques, which is mainly caused by the lack of methods to compare in vivo–acquired vwMRI with ex vivo histopathology. Nonetheless, sequence validation is essential for our conception of how we should interpret vessel wall lesions on vwMRI and how we should incorporate intracranial vwMRI in clinical practice. We would like to thank Alexander and colleagues for their critical review and compliment them on highlighting the possibilities of vwMRI and opportunities for further research.

REFERENCES

1. Zwartbol MHT, Geerlings MI, Ghaznawi R, et al. **Intracranial atherosclerotic burden on 7T MRI is associated with markers of extracranial atherosclerosis: the SMART-MR study.** *AJNR Am J Neuroradiol* 2019;40:2016–22 CrossRef Medline
2. van Hespen KM, Zwanenburg JJM, Harteveld AA, et al. **Intracranial vessel wall magnetic resonance imaging does not allow for accurate and precise wall thickness measurements.** *Stroke* 2019;50:e283–84 CrossRef Medline

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