Reviewer’s report

Title: Association between carotid area calcifications and periodontal risk: a retrospective study of panoramic radiographic findings

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Reviewer: Francesco D’Aiuto

Reviewer’s report:

The area of research of Dr Tiller and colleagues is of great interest. This goes beyond the consistent association reported in past of periodontal infections and cardiovascular diseases. Indeed the study is about a possible association between retrospective carotid calcifications and tooth loss. Despite with good intentions it is felt that authors do mis-interpret the data based on the study design and therefore a number of points of this manuscript would require revision.

Major compulsory revisions

The primary aim of this project is rather confusing and not clear at all. Indeed the use of a retrospective study would not allow defining prevalence as it is in the past and not cross sectional at one specific time.

Authors mix the terminology about cross sectional and retrospective design. How could be a retrospective cross sectional study? It is either retrospective or a cross sectional analysis.

There should be a rationale of using only 2 time periods for the radiographs chosen, also why those periods.

What was exactly the calibration exercise of the radiographs, which level of agreement was chosen?

The main confounder for the association between oral disease and carotid calcification is cigarettes smoking. As it was not recorded, authors correctly define it as a limitation, but do not stress this enough.

Statistical analyses are inappropriate and do not take account of potential multiple testing. Multivariate analyses should have been performed to confirm the original associations. This particularly true as both outcome (carotid calcifications) and exposure (periodontal disease) are age related conditions. As clearly the groups with and without carotid calcifications differ greatly for age, how can the comparison between the two as reported by the authors could be considered an association between the two and not merely an aging effect? One possible way to limiting the impact of age on the association is to use a multivariate logistic model for association. Nevertheless the two groups compared should have been matched for age if really authors wanted to test this association.

There is no mention about other dental infections/ diseases. Indeed it is rather
clear that bone loss and tooth loss are combined good measures of periodontitis, however presence of periapical infections or active decay are also considered infections and therefore authors should have examined those and included in a more global measure of oral disease burden.

Discretionary revisions
Figure 1-2 have already been reported in the table. Table 3 is superfluous.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests.