Reviewer's report

Title: Comparison of photographic and visual assessment of occlusal caries with a histological gold standard

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Reviewer: Hanne Hintze

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The manuscript is rather easy to understand even though it might need some proof-reading.

The aim of the study was to compare the diagnostic outcome of in-vitro visual and photographic detection of dentinal occlusal caries. This aim is relevant and the applied study design is appropriate to answer the aim and especially the gold standard is sufficient.

However, the manuscript needs a revision where the authors should deal with the following comments:

In general:
The median sensitivity is written to be 65.6% through out the text but in table 3 it is stated to be 65.5%.
The use of a hyphen in e.g. intraoral, in-vivo, in-vitro should be standardized through out the text.

Background:
It is too long. It should be shortened and be more focused to the aim.

Aims:
Too long and detailed. Could be written as: The aim was to compare the diagnostic performance of visual inspection with photographic assessment for the detection of occlusal caries in extracted human teeth.

Methods:
A description of the used teeth is needed (molars/premolars, permanent/primary teeth??)

What was the background of the observers?
Were the teeth visually examined in the same order at the two occasions?
Were the histological sections assessed in a microscope (magnification factor?) or where they just photographed at a standardized zoom level?
The registration categories for caries with the histological method listed on p 8 are not identical with the criteria listed in table 1.
A precise definition of the various registration criteria is missing.

Data analysis:
Which statistical test was used for comparison of the accuracy of the two methods under evaluation?

Please explain why arrested caries was defined as caries? This is problematic in the Discussion section when it is stated that the present results can be used for estimation of the need of restorative treatment.

Which p-value was defined to be statistical significant?

Results:
A more detailed description of the sensitivity and specificity of the two tests would be appropriate.

Discussion:
Could be shortened and be more focused to the aim and the results.
A section concerning speculation about the use/diagnostic outcome of the photographic method applied under clinical conditions is needed.

It is strange to conclude that “the photographic method has a caries detection capability that is at least comparable to the visual method” when the photographic method had a median sensitivity being 24% higher than the visual method (this difference must be statistical significant?).

References:
Maybe the numbers can be reduced.
1: Year is missing.
5+27: No space between the words in the journal’s name.
7: Year, vol. and pages are missing.
Tables:
1: It would be more appropriate to exclude the tooth with missing data from the final results.
2: 1st and 2nd should be written identical in the two columns.

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

Quality of written English: Needs some language corrections before being published

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests' below.