Author’s response to reviews

Title: The Push-out Bond Strength of calcium silicate-based endodontic sealers

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Author’s response to reviews:

Dear reviewers, thank you for your comments.

Reviewer #1:

typo in Abstract: The root canals instead The Root canals

Changed according to the comment.

Page 2, line 56 - Keywords - Complete with Endo CMP Sealer or remove BioRoot RCS and Total Fill BC Sealer

Key word Endo CPM was added.

Page 6, line 4 - Was gutta-percha cone covered with root canal sealer?

The GP cone was covered with sealer. Changed according to the comment in the MM section.
Reviewer #2: You said in Mat and Meth you rinsed with EDTA 17% as a final irrigant to remove the smear layer. Did you ever verify whether the smear layer was removed by your rinsing protocol? Usually you need 1 min of application time to remove the smear layer. Did you rinse for one min?

Please explain and or discuss.

Irrigation was performed with a volume of 1mL per minute. This information was added according to the comment in the MM section.

Reviewer #3:

Introduction:

- Page 4 pdf - It is written in a thesis format and need to be revised. Paragraphs on commercial products can be changed/combined to a single paragraph on the material.

This part was revised.

- page 4: "Though there is some data about the interfacial interaction between calcium silicate-based sealers and dentine, relevant data about the dislodgement resistance of calcium silicate-based sealers are currently only available for Total Fill BC Sealer. Only few respectively no data were found for Endo CPM Sealer and BioRoot RCS." The structure of the sentences needs to be revised. Please add references of these relevant data. What is meant by Only few respectively no data?

Only one study was found for Endo CPM Sealer concerning dislodgement resistance [Assmann et al.] and no data was available for BioRoot RCS. Changed according to the comment in the MM section.
Materials and methods:

- How the authors examine the canal configuration of the teeth and confirm that they were all one canal (radiograph?). Please add more details.

“This was verified by viewing their buccal and proximal radiographs. The radiographs were also used to check the curvature of the root canals using an imaging software.” This is already stated in the MM section.

- Please add the inclusion/exclusion criteria of the teeth (caries, etc).

The exclusion criteria (cracks, caries, previous root canal treatment) was added according to the comment. The inclusion criteria (human premolar, one straight canal, single apical foramen) is stated in the MM section. Changed according to the comment in the MM section.

- "All teeth were cut to a length of 19 mm and a working length of 18 mm was established." I am not in full agreement of this statement because not all teeth have an apical constriction 1 mm short of the root apex (in addition, many times, the major apical foramen does not coincide with the root apex).

A more precise description was added to the MM. The working length was obtained by measuring the length of the initial instrument (K-files size 10 (VDW, Munich, Germany)) at the major apical foramen minus 1 mm. All teeth were cut in a way that a working length of 18 mm was established.

- Page 6 line 41: Please add the concentration of the NaOCl

Changed according to the comment.

- Please briefly state the method of randomization used.
No method of randomization was used. As all teeth were cut in a way that WL was 18mm for all teeth, were of a strict inclusion criteria and were all instrumented in the same manner, no specific protocol of randomization was needed. The teeth were randomly divided (MM section).

- Page 7 line 11: Perhaps it is better to replace canal orifices instead of coronal access cavities since the samples were decoronated.

Changed according to the comment.

- Along methodological procedures, there is no mention for the blinding of operator(s). Did the authors follow any guidelines for maintaining the study at a low risk of bias?.

For the dislodgement resistance measurement and mode of failure evaluation specimens were coded by the supervisor, who was the only person being aware of the allocation of the coded specimens to the groups. This was added to the MM section. The evaluation of the mode of failure was performed by two blinded operators.

- Are the methodological procedures follow some other studies (if so please add references) or it is a novel way for examination?

The detailed methodological procedures were solely defined for the current study. The methods of Push-Out test are very heterogenous throughout the literature. This is a major finding of the review by Neelakantan et al. 2018.

Results:

- Reporting of results does not show any blinding procedure for the examiner.

We feel, that this concern has been addressed by our comments added in the MM section.
Discussion:

- Some important points need to be discussed - why examining the push out bond strength is important for root canal sealers? - any clinical implications?

Changed according to the comment in the discussion section.

- Page 8 line 60 - where is the reference number of the citation Chen et al 2013, Pane et al. 2013

Changed according to the comment.

- Page 10 line 13: Please replace lateral condensation with lateral compaction.

Changed according to the comment.

- Page 10 line 44: In what way the protocols are different.

Changed according to the comment.

- English requires minor revisions. Some words are written as UK and some USA (such as dentin, dentine). Please revise.

Changed according to the comment.

Changed according to the comment.

- What are the limitations of the study?

Added according to the comment (extracted teeth, age of patient, in vitro study)

- Please a conclusion section.

Added according to the comment..

Reviewer #4:

Results were expressed in Newton per square millimeters. However, this values are similar to Megapascals [MPa] which is more common to express and to compare bond strength values.

Added according to the comment.

The authors should include the potential effect of their irrigation protocol with regard to the investigated bond strength. …But the use of EDTA as final irrigation was shown to have also softening effects on root dentin which may affect bond strength. But other irrigants may also do so. However, please include this aspect within the Discussion Section.

The investigations of irrigation and POBS was not a major aim of this study. Still the effect of EDTA or other irrigants on the root canal dentin is a major concern and therefore subject of a current study. Therefore we felt not to address this point in this study, but will do so in the succeeding study.

Please correct page 9, line 6: "toot" into "tooth"
Changed according to the comment.