Author's response to reviews

Title: Evaluation of the Smear Layer Removal and Erosive Capacity of EDTA, Boric Acid, Citric Acid and Desy Clean Solutions: An in vitro study

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Author's response to reviews: see over
Dear Prof. Andreas Braun,

On behalf of the authors of this manuscript, I would like to thank you and the referees for your valuable comments and corrections. We have tried to address each comment both in the review file and in the revised manuscript. Please see our responses below and revisions as highlighted in revised manuscript.

**Responses for the Comments of the first Reviewer (Prof. Edgar Schafer):**

**Comment:** Page 3, line 42: Delete “GMBH” and provide city of the manufacturer. Moreover, it would be of interest for the reader to have some more detailed information about the composition and the concentration of the ingredients of Desy Clean. Please provide.

**Response:** We sincerely appreciate the contributions of the reviewer. According to the comments of the reviewer, “GMBH” was deleted and information about the city of the manufacturer was added as follows; (Sojall, Salzburg, Austria). Additionally detailed information about the composition and the concentration of the ingredients of Desy Clean was added in introduction section as follows: “Desy Clean (Sojall, Salzburg, Austria) solution contains sorbic acid (0.15 ml/L), hydrogen peroxide (128 ml/L), sodium benzoate (0.21ml/L), acetic acid (26.64 ml/L) and water (845 ml/L). The manufacturer claims that 5% Desy Clean possesses promising antibacterial activity and high biocompatibility [9].”

**Comment:** Page 4, line 55: Single-rooted teeth were selected. I assume only teeth with straight roots and root canals were included. Please provide information regarding canal curvature and add the method how this was assessed (e.g. “Teeth with curvature of less than 5° according to the method described by Schneider”).

**Response:** As suggested by the reviewer related sentence was revised as follows: Twenty-five intact single and straight (less than 5° curvature) rooted teeth extracted for periodontal or prosthetic reasons were collected for this study.

**Comment:** Page 6, lines 111 and 115: It is more accurate to say “root canal
treatment” instead of “endodontic treatment” and to use “root canal-treated teeth” instead of “endodontically treated teeth”.

**Response:** We agree with the reviewer. According to his suggestions the term “root canal treatment” was used instead of “endodontic treatment” and “root canal-treated teeth” preferred instead of “endodontically treated teeth”

**Comment:** Page 7, line 138: the use of personal pronouns should be avoided.

**Response:** Personal pronouns were deleted as follows: “One of the most important finding of the present study was that Desy Clean had less erosive effects while removing the smear layer”

**Comment:** Page 7, line 139: reference must be given as in my version an error with the reference number occurred

**Response:** Error with the reference number (reference number 9) was corrected.

**Comment:** Table 1: statistical differences could be included in this table (e.g. using superscript letters)

**Response:** Superscript letters were added to the revised table 1 and 2 in order to define the statistical differences.

**Responses for the Comments of the second Reviewer (Prof. Michael Hülsmann):**

**Comment:** Abstract: the volume of irrigants should be included, also the application technique (syringe? Needle size? Depth of needle introduction? Time of irrigation?)

**Response:** We are grateful to the reviewer because of his contributions. According to the suggestions of the reviewer irrigation procedure was explained more detailed in the revised manuscript as follows: “After each instrument, 1 mL 2.5% NaOCl was used for irrigation with a 27-gauge irrigation needles (KerrHawe, SA, Bioggio, Switzerland) attached to a 2-mL syringe. After instrumentation, the teeth were divided
randomly into five experimental groups according to final irrigating solution: 5% EDTA (group 1), 5% BA (group 2), a mixture of 5% BA and 2.5% CA (group 3), 2.5% CA (group 4), and Desy Clean (group 5). Then, each root canal was irrigated with 2.5% NaOCl and distilled water. During the final irrigation procedure 27-gauge needles were attached to a 5-mL syringe, and were positioned 1 mm short of working length. Irrigation time for every solution was 1 minute.”

**Comment:** It should be mentioned that different scores were used for evaluation of s.l. and erosion.

**Response:** Different score systems were used for smear layer and erosion evaluation. Score system for smear layer and erosion were mentioned in the fifth and sixth paragraphs of material and methods section. Smear layer removal was evaluated by means of numerical evaluation scale, which was suggested by Hülsmann et al. in 1997 (lines 74-78). Degree of erosion was scored according to classification by Torabinejad et al. (2003). (lines 79-82).

**Comment:** If approval of an Ethics Committee has been given, please note that fact.

**Response:** Information about the approval of Ethics Committee was added to materials and methods section.

**Comment:** What about controls? Teeth with root canals prepared but not irrigated with the acids/chelators should have been used to confirm the presence of an adequate smear layer and un-eroded dentine before final irrigation.

**Response:** According to the suggestions of the reviewer following information is given in material methods section: "As control, five specimens were prepared same as the test groups, but not irrigated with the acids or chelators, and the presence of an adequate smear layer and un-eroded dentine before final irrigation was confirmed (Figure 1F, 2F)."

**Comment:** How were the places selected from which photographs were taken?
**Response:** Three photographs were taken from randomly selected areas of each third (apical, middle and coronal) both for x500 and x1000 magnifications.

**Comment:** Were the specimens blinded before SEM investigation?

**Response:** All samples were blinded before SEM evaluation. This was mentioned in the revised materials and methods section

**Comment:** It must be: intra-examiner agreement and inter-examiner agreement. Generally, English requires some attention by the editor

**Response:** Incoherency in the sentences was corrected accordingly in the revised manuscript.

**Comment:** p. 7: Mistake in referencing has to be corrected.

**Response:** Error about the reference 9 was corrected.

**Comment:** Time is an important factor in chelation should be discussed.

**Response:** According to suggestions of the reviewer, following paragraph was added to the discussion section: “Teixeria et al. [26] reported that 1, 3 and 5 minutes application times for EDTA and NaOCl were equally effective for removal of the smear layer; additionally Saito et al. [27] reported that 1 minute application time of EDTA and NaOCl solutions is efficient in removing smear layer on the root canal walls. Sen et al. [20] preferred also 1 minute application time for each final irrigation solution and their results were in agreement with Saito et al. [27]; therefore in the present study contact time of each irrigant was set at 1 minute during the final irrigation procedure.”