Author's response to reviews

Title: Comparison of anchorage reinforcement with temporary anchorage devices or a Herbst appliance during lingual orthodontic protraction of mandibular molars without maxillary counterbalance extraction

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

we would like to address the comments by the two reviewers as follows:

**Reviewer #1 / ROBERT GARCIA**

1 - About the samples :

- Who decide of the treatment plan ?

- Temporary anchorage devices (TAD) versus Herbst appliance (one, two or more practitioners decide ?)

**Answer:**

Patients were recruited consecutively; they were treated primarily by TAD from January 2003 to June 2009, and by Herbst from July 2009 to December 2013. Tx plans were approved by one clinician (Prof. Dr. Wiechmann, DW) prior to starting orthodontic Tx.

The informations have been added to the manuscript.

- Previous choose of reinforced anchorage : Is the choose randomised (cohort study) ? If not what are the choose criterias ?

**Answer:**
No, there was no randomisation. Instead, consecutive patients meeting inclusion criteria were used.

*The information has been added to the manuscript text.*

2 – About the study design
- For the TAD patients who place the mini screws (one, two or more practitioners). Do this protocol standardized?

**Answer:**

Miniscrews were placed by Dr. Dr. Berens, Hannover, and/or DW. All TAD placements were approved prior to implementing protraction mechanics, by DW.

*The following information has been added to the manuscript text:*

Miniscrews were placed by Dr. Dr. Berens, Hannover, and/or DW. All TAD placements were approved prior to implementing protraction mechanics, by DW.

- For the Herbst patients, what is the propulsion amount: same for each case?

**Answer:**

Herbst telecopes were activated in individual step-wise increments, with a final over-correction of the sagittal discrepancy.

*The information has been added to the manuscript text.*

- For both samples, what is the force amount apply on the buccal and lingual sides and how the force measurement have been made? At least, these recommendations must be discuss in the «Discussion chapter»

**Answer:**

*The following information has been added to the manuscript text:*

The forces applied to the protraction of teeth by the two power chains were at the time point of implementation up to 150 cN (1.5 N) per power chain or side, i.e. up to a maximum of 300 cN per protraction mechanic.
Reviewer #2 / Urban Hägg

General comment. The topic of the paper is of interest, but according my opinion the concept seems to work with Herbst in combination with Lingual orthodontics - and that is of interest to publish. The authors have reported in an earlier publication that the anchorage loss of lower incisors is much less with this concept compared to the conventional Herbst. Later tooth/wire based versions of Herbst appliance such as Forsus results in even larger proclination of the lower anteriors (Pancherz and Ruf, 2009). The concept used in the present paper allows to move teeth along rectangular wires, while having the Herbsts attached on the buccal surface of the lower canines, while the conventional Herbst comprises usually of 4 casted splints, one in each posterior segment extended from 7/6 to 4/3. Subsequently only the anterior teeth can be moved with bracket appliances while the conventional Herbst is place. This means that the finding of this paper cannot be extrapolated to those of conventional Hersbt and labial orthodontics.

Answer:

We see the point of this reviewer, and yes, from a sheer technical perspective, the comparison of labial appliances using casted splints with a lingual appliance with an unimpeded lingual multi-bracket appliance is difficult. On the other hand, here, we are comparing two competing tx plans or tx alternatives (lingual appliance plus Herbst, or lingual appliance plus TAD).

The following information has been added to the discussion:

This study compared two competing treatment alternatives for gaining anchorage during space closure (lingual appliance plus Herbst, or lingual appliance plus TAD). The findings have a limitation concerning generalizability in that they were achieved with a lingual Herbst appliance that is separated from the lingual multi-bracket appliance, in contrast to Herbst derivates that are attached to the archwire, or to those using casted splints. Tooth movement
along archwires is unimpeded here, while it may not be so with conventional Herbst appliances using casted splints and labial fixed orthodontic appliances.

Introduction. Should be more concise. Some statements are not supported by references e.g. 'molars' are quite common lost to caries'....' how common is it? Which age group?

Answer:

The following references and information have been added to the manuscript text, and the list of references has been adapted:


The presentation of results should be consistent, preferably one digit only. At present one or two digits are used in the text while mostly 3 digits are used in the tables

Answer:

We have reduced the positions after decimal points to a maximum of two digits, with an exception made for the presentation of p-values.

The paper should be focused on the two concepts investigated TADs and Herbs, respectively, in combination with a specific version of lingual orthodontics - Incognito.

Answer:

We hope that the information added to the discussion in response to Prof. Hägg’s first comment also addresses this general remark sufficiently.

We would like to express our thanks to the reviewers for the time they have put in commenting on our manuscript.

Sincerely,
Rebecca Metzner