
Peer Review File

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Reviewer A

This manuscript presents a narrative review aimed at assessing the clinical significance of the peri-implant phenotype and evaluating the timing of treatment strategies.

Comments:

The aim of the study could be good in the sense that can provide researchers and clinicians with more knowledge about the peri-implant phenotype. However, some major concerns arose while I was reviewing this manuscript.

Concerns:

Introduction section:

- Missing references when the authors mentioned “a series of studies have investigated the connection between natural teeth and periodontal soft tissues”. There are recent studies on the topic of periodontal phenotype that recently also suggested including the supracrestal tissue dimensions as part of the periodontal phenotype due to its clinical implications (<https://doi.org/10.1002/JPER.22-0434>).

Reply: We are grateful for the advice. And we have cited this reference here (see Page 3, line 4).

Changes in the text: Introduction, Page 3, line 4, added one reference.

- Although in the past the periodontal phenotypes were divided into thick-flat, thick-scalloped, and thin-scalloped types. Most recent studies only divided into two to make it simpler. Nevertheless, citations are missing.

Reply: Thank you for pointing out our mistakes. Periodontal phenotype can be divided into thin (≤ 1 mm) and thick (> 1 mm) types based on the gingival thickness, which is simpler. We have added some content and added a reference here (see Page 3, line 10-12).

Changes in the text: Introduction, Page 3, line 10-12.

- I do not understand very well why the authors wrote “at present, a clear definition of “peri-implant phenotype corresponding to the periodontal phenotype of natural teeth is still lacking”. Later, was correctly reported that the peri-implant phenotype was defined by Avila-Ortiz and collaborators in 2020. Please, modify this section.

Reply: Thank you for pointing out our mistakes. We originally intended to note that when the periodontal phenotype was proposed, the peri-implant phenotype had not been clearly defined. But we misrepresent this message, so we removed this sentence (see Page 3, line 14-15).

Changes in the text: Introduction, Page 3, line 14-15.

- What does it mean “strong peri-implant tissue support”?

Reply: Thank you for raising this question. We think that strong peri-implant tissue support includes abundant bone tissue and suitable soft tissue, and we have revised our expression in the corresponding paragraph (see Page 3, line 27).

Changes in the text: Introduction, Page 3, line 27.

Material and methods section:

- Taking into consideration that the peri-implant phenotype was defined in 2020, the search is not completely adequate to my understanding. Many clinicians utilize even nowadays around dental implants (and more in the past before the 2017 new classification by the AAP and EFP) terms such as “biotype”, “gingiva”, “gingival thickness”, “keratinized gingiva” “tissue”... Therefore, I think there are many articles that could have been potentially missing during the search.

Reply: Thank you for pointing out our mistakes. We wonder that the application of the search term "peri-implant tissues" can reduce the missing articles to a certain extent, and also pointed out our limitations (see Page 4, line 19-21).

Changes in the text: Methods, Page 4, line 19-21.

Discussion section:

- The terminology used must be adequate even more when the definition of peri-implant phenotype was given. “The KMW refers to the coronal-root distance”? “peri-implant gingival margin”? Please, use the right terms. Authors are confusing terminology between natural teeth and dental implants.

Reply: Thank you for pointing out our mistakes. We have replaced "coronal-root distance" with "vertical height", and replaced "peri-implant gingival margin" with "mucosal margin" (see Page 6, line 24).

Changes in the text: Discussion, Page 6, line 24.

- The information given here does not give additional information than the original manuscript by Avila-Ortiz and collaborators defining the peri-implant phenotype and its clinical relevance.

Reply: We are grateful for the advice. We overviewed the concept of peri-implant phenotypes here, and described the clinical significance of the relevant digital indicators here to provide a prelude to the surgical treatment described in the later section.

- There are parts that are not based on solid scientific evidence and the authors are missing many citations.

Reply: We are grateful for the advice. We have added some references to support some of the statements (see Page 9, line 19; Page 9, line 22; Page 14, line 8, Page 14, line 11).

Changes in the text: Discussion, Page 9, line 19; Page 9, line 22; Page 14, line 8, Page 14, line 11.

- Although the use of an apically positioned flap combined with a free mucosal graft is a treatment option to increase the band of keratinized mucosa width. The use of subepithelial connective tissue grafts has been shown to also increase the keratinized mucosa. Therefore, that statement is not completely right.

Reply: We are grateful for the advice. Although CTG is beneficial to keratinized mucosa, it is more suitable for increasing soft tissue thickness, and FGG is more commonly used to increase the keratinized mucosa width. So, we have used the word "recommended" in Page 9, line 9.

- There are many ways to also obtain the mucosal thickness such as the superimposition of the intraoral or extraoral scans and the CBCT.

Reply: We are grateful for the advice. And we have added some content and added a reference about digital scan combine with CBCT here (see Page 9, line 22).

Changes in the text: Discussion, Page 9, line 22.

- Not only acellular dermal matrix can be utilized to increase the mucosal thickness. Other substitutes have been also reported in the literature.

Reply: We are grateful for the advice. And we have added xenogenic collagen matrix, enamel matrix derivative and platelet-rich fibrin here (see Page 9, line 18-19).

Changes in the text: Discussion, Page 9, line 18-19.

- In the subsection of STH, when the authors mentioned "when the mucosa is too thick", are they referring to STH? In that case should be tall.

Reply: We are grateful for the advice. And we have replaced "when the mucosa is too thick" with "When the height of mucosa is too tall" (see Page 11, line 4).

Changes in the text: Discussion, Page 11, line 4.

- Guided bone regeneration is not a technique is a biological principle.

Reply: Thank you for pointing out our mistakes, we have revised our expression in the corresponding paragraph (see Page 11, line 11).

Changes in the text: Discussion, Page 11, line 11.

- What do the authors want to say here? "soft tissue augmentation can be performed simultaneously in an edentulous area with an insufficient KMW or thin supracrestal tissue but sufficient bone mass provided that. No additional guided bone regeneration is required"?

Reply: Thank you for pointing out our mistakes. We originally intended to express that the blood supply of soft tissue grafts would be influenced by the presence of bone grafts, so soft tissue augmentation can be performed simultaneously with implant placement to reduce the number of surgeries and trauma. And we have revised our expression in the corresponding paragraph (see Page 11, line 12-17).

Changes in the text: Discussion, Page 11, line 12-17.

- There are many statements based on clinical experience but not based on the literature review. For example: “soft tissue grafting after the final crown has been delivered has a poor prognosis”, “generally, soft tissue surgery following restoration is performed only to treat peri-implant mucosal recession or peri-implantitis”.

Reply: Thank you for pointing out our mistakes. We have added references in the corresponding paragraph (see Page 14, line 8; Page 14, line 11).

Changes in the text: Discussion, Page 14, line 8; Page 14, line 11.

Other comments:

- I recognized the efforts that the authors made in writing this manuscript and conducting this narrative. However, I considered this manuscript not to have the quality to be published. I think the authors should be more concise since there is a lot of information in the manuscript and it is really difficult to follow. The final message is diluted. I strongly recommend the authors double-check the manuscript since there are discrepancies between some statements and the literature, we are missing important citations, and there are many statements where the clinical experience has higher weight than the clinical evidence. There are also terminology mistakes throughout the text.

Reply: We appreciate your valuable time, and we have revised this review according to your comments.

Reviewer B

I appreciate your effort in conducting this narrative review. In my opinion, there are several issues that need to be clarified/addressed. Below are more specific comments by section:

1. In the Introduction section, the authors mentioned that 'At present, a clear definition of 'peri-implant phenotype' corresponding to the periodontal phenotype of natural teeth is still lacking.' However, in the same paragraph, they provided a definition of 'peri-implant phenotype' and continued using this definition throughout the manuscript. To avoid confusion, it is essential to clarify which specific definition the authors intended to follow and the reasons behind their choice.

Reply: Thank you for pointing out our mistakes. We originally intended to note that when the periodontal phenotype was proposed, the peri-implant phenotype had not been clearly defined. But we misrepresented this message, so we removed this sentence (see Page 3, line 14-15).

Changes in the text: Introduction, Page 3, line 14-15.

2. The Methods section briefly mentions data extraction but does not provide specific details on what kind of data was extracted from each paper, how it was done, and whether multiple researchers were involved in the process to ensure reliability.

Reply: We are grateful for the advice. We mainly extracted the data from original researches, systematic reviews describing peri-implant tissue, and the two corresponding authors were involved in the process to ensure reliability. And we have added some content in the methods section (see Page 4, line 15-19).

Changes in the text: Methods, Page 4, line 15-19.

3. The Methods section does not elaborate on how the papers were screened and selected for inclusion in the study. Although in Table 1, the authors mentioned that “no restrictions on study type or language”, a clear and systematic approach to study selection is necessary to ensure the inclusion of relevant and high-quality papers.

Reply: We are grateful for the advice. And we have added some content in the methods section (see Page 4, line 15-21).

Changes in the text: Methods, Page 4, line 15-21.

4. The current Methods section does not explicitly address how the information from the identified papers was integrated, analyzed, and synthesized. This is a crucial aspect of any research, as it explains how the data from various sources were combined, compared, and interpreted to draw meaningful conclusions.

Reply: We are grateful for the advice. And we have added some content in the methods section (see Page 4, line 15-21).

Changes in the text: Methods, Page 4, line 15-21.

5. The structure of the Discussion section is confusing because there is a lack of logical flow between different subsections. The authors first summarized the definition and importance of each peri-implant phenotype component for peri-implant health in the subsection titled ‘Overview of the peri-implant phenotype’. These pieces of information can be integrated into the subsection titled ‘Considerations regarding the peri-implant phenotype during implant therapy’.

Reply: We are grateful for the advice. And we have integrated these pieces of information into the subsection titled "Considerations regarding the peri-implant phenotype during implant therapy" (see Page 6, line 23-Page 8, line 16)

Changes in the text: Discussion, Page 6, line 23-Page 8, line 16.

6. The subsection titled ‘Considerations regarding the peri-implant phenotype during implant therapy’ in the Discussion section mentions several clinical protocols that were reported to modify peri-implant phenotype components during different phases of implant treatment. Additionally, several figures were used to demonstrate the clinical protocols. However, some of the statements made in this subsection lack evidence to support them. It is also important to clarify whether the figures were cited from published articles or if they are from clinical cases the authors treated.

Reply: We are grateful for the advice. We have added some references to support some of the statements (see Page 9, line 19; Page 9, line 22; Page 14, line 8, Page 14, line 11). And we also clarified the figures were from clinical cases the authors treated (see Page 10, line 3-4).

Changes in the text: Discussion, Page 9, line 19; Page 9, line 22; Page 10, line 3-4; Page 14, line 8, Page 14, line 11

7. The structure used in the subsection titled ‘Considerations regarding the peri-implant phenotype during implant therapy’ in the Discussion section seems to apply only to early and delayed implant placement. However, the authors also mentioned cases of immediate implant placement, but only in the paragraph related to the final restorative phase. If the authors intend to include immediate implant placement in this review, more discussions and a modified structure will be needed.

Reply: We are grateful for the advice. The final restorative effects of immediate implant in the aesthetic zone. The long-term restorative outcome of immediate implants in the aesthetic zone is the focus of current research, and the effect of hard and soft tissue augmentation on peri-implant tissue stability has been elucidated in our collection of references, which can provide some guidance for the improvement of peri-implant phenotypes in immediate implantation.

8. There were important limitations in the methodology. Including a Limitations section to describe them is appropriate.

Reply: We are grateful for the advice. Until the peri-implant phenotype was clearly defined, some studies utilized the terminology related to the natural teeth, which possibly with some relevant literature omitted during the process of reviewing. And we have added some content in the methods section (see Page 4, line 19-21)

Changes in the text: Methods, Page 4, line 19-21.

9. The Conclusions section is too long, and some contents are more appropriate for the discussion section.

Reply: We are grateful for the advice. And we have revised this section (see Page 14, line 27-Page 15, line 6)

Changes in the text: Conclusions, Page 14, line 27-Page 15, line 6.

Reviewer C

1. Please unify the search term.

10 “peri-implant phenotype”, “peri-implant tissues”, “implant therapy”, “soft tissue
11 augmentation”, “bone tissue augmentation”, “bone thickness” “keratinized mucosa”,
12 “mucosal thickness”, “supracrestal tissue height”, “implant restoration”, and “clinical
13 treatment” (Table 1). [Original researches, systematic reviews describing peri-implant](#)

Search terms used	“peri-implant phenotype”, “peri-implant tissues”, “implant therapy”, “soft tissue augmentation”, “bone tissue augmentation”, “keratinized mucosa”, “mucosal thickness”, “supracrestal tissue height”, “peri-implant bone thickness”, “implant restoration”, and “clinical treatment”
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Reply: Thank you for pointing out our mistakes. And We've unified the search term (see Page 4, line 14).

Changes in the text: Methods, Page 4, line 14.

- 2. The word “studies” is inconsistent with the number of references cited here, please check if “studies have” should be changed into “a study has”. Otherwise, here should cite more than 2 studies.**

**note: References should be cited consecutively and consistently according to the order in which they first appear in the main text. If the studies are not included in the reference list, please also update the current version.*

“a series of studies have investigated the connection between natural teeth and periodontal soft tissues(2).”

Reply: Thank you for pointing out our mistakes. And We've cited 3 references here (see Page 3, line 4).

Changes in the text: Introduction, Page 3, line 4.