

RAPPORTEURS

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study

Restoration contour is a risk indicator for peri-implantitis: A cross-sectional radiographic analysis

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RELEVANT BACKGROUND

Risk factors for peri-implantitis such as poor oral hygiene, history of periodontitis, cigarette smoking, and diabetes have been described in the literature. The known prosthetic factors related to peri-implant disease are cement remnants and a crown-restoration margin positioned ≤ 1.5 mm from the crestal bone. However, restoration contour (emergence angle and/or profile) as a risk factor for peri-implantitis has not yet been assessed in a clinical trial.

AIMS

The aim of this study was to determine whether the restoration emergence angle and/or profile may be associated with the higher risk of peri-implantitis around bone- and tissue-level implants.

MATERIALS AND METHODS

This cross-sectional study included 96 patients with 225 implants (mean follow-up: 10.9 years). Peri-implantitis was defined as the presence of BOP and/or suppuration, with 2mm of detectable bone loss after initial remodelling and probing pocket depth ≥ 4 mm. Emergence profile and angle were measured on digital radiographs taken using paralleling technique. Emergence angle was calculated as the angle between the implant long axis and a line tangent to the restoration. An angle >30 degrees was defined as cut-off point for over-contoured restoration. The emergence profile was categorised as concave, straight or convex. The measurements were performed both for mesial and distal sites and rated three times. The majority selection was chosen as the emergence profile. For the bone-level implants, the abutment was considered as part of the restoration, while for the tissue-level implants the emergence angle and profile were assessed above the platform at the tissue level. The examiner was blinded to the implant status in order to prevent potential bias.

results

Eighty-three patients with 168 implants met the study's inclusion criteria: 101 bone-level implants and 67 tissue-level implants.

- The prevalence of peri-implantitis was 22.8% in the bone-level group and 7.5% in the tissue-level group at implant level.
- In the bone-level group, the mean \pm standard deviation (SD) emergence angle was 27.8 degrees \pm 11.6 on the mesial surface and 25.1 degrees \pm 10.3 on the distal surface.
- In the tissue-level group, the mean \pm SD emergence angle was 28.6 degrees \pm 14.4 on the mesial surface and 28.3 degrees \pm 13.3 on the distal surface.
- Emergence angles tended to be larger for convex profiles (mean 37.6 degrees, SD 11.7) compared

with straight or concave profiles (26.7 degrees, SD 8.9). This pattern was similar for bone and tissue-level implants.

- Peri-implantitis was significantly greater when the emergence angle was >30 degrees in bone-level implants. No statistically significant difference was reported for the tissue-level-implants group.
- For both bone-level and tissue-level implants, the emergence profile was statistically associated with peri-implantitis.
- For the bone-level group, the combination of a convex profile and a wide emergence angle showed the highest rate of peri-implantitis (37.8%). This was not the case for the tissue-level group.



LIMITATIONS

- Sample size: the tissue-level group had a limited number of patients, and only two patients presented peri-implantitis. No general conclusions can be drawn from this data.
- Study design: the implant status was used as the outcome parameter instead of the marginal bone loss on each interproximal site. The direct association between the restoration contour and the marginal bone loss was therefore unknown.
- The lingual and facial aspects of the restorations contour could not be visualised using the paralleling technique.



CONCLUSIONS

- An emergence angle of >30 degrees is a significant risk indicator for peri-implantitis and a convex profile creates an additional risk for bone-level implants, but not for tissue-level implants.
- In the literature there is insufficient evidence available on the role of over-contoured implant restorations related to peri-implantitis. However, the evidence regarding over-contour and overhanging restorations on teeth might help to reveal the mechanism for increased prevalence of peri-implantitis in the bone-level group in this study.
- A larger-scale long-term study assessing the prevalence of peri-implantitis in platform-switching implants and its relation to restoration contours is warranted.



IMPACT

- The influence of the restoration contour on the risk for developing peri-implantitis should be taken into consideration when placing an implant and designing the prosthetic restoration.
- The correlation between interproximal contours and peri-implantitis found in this study is novel and valuable information for clinicians.



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