below this threshold, although deformation occurred, it was not statistically significant.

Discussion

In this preliminary report, test abutments showed a significant rotation only after 20 dis-/reconnection cycles, indirectly revealing a proportional implant distortion. Below the threshold of 10 cycles, 3D translation and rotation values were minimal and potentially interpreted as an intrinsic error during the scanning and alignment process (accuracy error ≤ 10 µm).

The apparently discordant results of the multiple comparison tests (Bonferroni and Scheffe) is attributable to the fact that deformations between two consecutive groups were very little. In fact, the Scheffe test, when comparing all groups to one another, revealed the statistical differences occurring among 1-2-5- and 20 insertions.

Despite the high resistance to deformation of the tested implant-abutment complex, results should encourage clinicians to minimize the number of try-in sessions, supporting, when clinically possible, the "one abutment-one time" concept.[5]

Limits of the study were the small sample size and the indirect measurement method. Another limitation of the study was the chosen torque value: While some manufacturers suggest a value up to 32 Ncm, in the present research, 20 Ncm was selected for screw tightening. With a higher screwing torque, deformations of the implant connection might take place even with fewer prosthetic maneuvers.

For these reasons, to generalize present outcomes, further studies are needed.

Conclusions

Results of this study should encourage clinicians to minimize the number of handlings of titanium implants. In fact, damage of the internal connection could lead to an increased possibility of mechanical implant/prosthodontics complications. This study only evaluated the effects on one implant system with one abutment design. Further research is needed to determine the outcome of different implant systems and implant-abutment connections.

Acknowledgments

The authors declare no financial interest, either directly or indirectly, in the products listed in the study. The authors highly appreciated the skills and commitment of Dr Audrenn Gautier in the supervision of the study. The authors deeply thank Dr Alessio Terziani for the professional support in CAD/CAM process comprehension.

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Literature Abstract

The pathology of bone tissue during peri-implantitis

Approximately 30% of patients with dental implants develop peri-implantitis. In this paper, the authors describe the gene and protein expression patterns of peri-implantitis bone tissue compared with healthy peri-implant bone tissue. The bone tissue of dental implants was taken from 12 patients with peri-implantitis. Two healthy implants served as controls. The patients were members of an implant cohort (without periodontitis) at the University of Goettingen and in a program of intensified oral hygiene; therefore, bleeding on probing and the Quigley-Hein Plaque Index were negative. From bone tissue of failing implants, cells from the osteoblastic lineage derived from peri-implantitis samples were characterized. The levels of typical bone matrix molecules, including SPP1, BGLAP, and COL9A1, in patients with peri-implantitis were reduced, while the inflammation marker interleukin-8 (IL-8) was highly expressed. RUNX2, one of the transcription factors of mature osteoblasts, was also decreased in peri-implantitis. Finally, the human telomerase reverse transcriptase immortalized cell line from peri-implantitis exhibited a more fibro-osteoblastic character than did the healthy control. In conclusion, the present investigation indicated that, together with the process of inflammation, fibro-osteoblastic cells from the peri-implantitis bone tissues are also responsible for the failure of osteointegration by generating a tissue that is more fibrous and expresses less osteogenic markers.

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Reprints: N. Miosge, Georg August University, Tissue Regeneration and Oral Biology Work Group, Department of Prosthodontics, Robert Koch Straße 40, 37075 Goettingen, Germany. Email: nmiosge@gwdg.de—*Tee-Khin Neo, Singapore*