Clinical Application of a Modified Anatomic Healing Abutment in Implant Placement for Maxillary Central Incisors

Wenchao Li[1, 2], Yuan Tian[2], Senhao Li[2], Baoyin Batu[3], Rihan Wu[3], Damdindorj Boldbaatar[4], Batbayar Badral[1, *]

[1]Department of Oral and Maxillofacial Surgery, School of Dentistry, Mongolian National University of Medical Sciences, Ulaanbaatar, Mongolia

[2]Department of Oral Implantology, Affiliated Hospital of Chifeng University, Inner Mongolia Key Laboratory of Oral Craniomaxillofacial Diseases Research, Chifeng, China

[3]Department of Surgery, Affiliated Hospital of Chifeng University, Chifeng, China

[4]Department of Physiology, Mongolian National University of Medical Sciences, Ulaanbaatar, Mongolia

Email address:

nmcflwch21@126.com (Wenchao Li), batbayar@mnums.edu.mn (Batbayar Badral)

[*]Corresponding author

Abstract

Background: Successful implant restoration requires meticulous attention to the gingival soft tissue's contour, crown, and texture. The healing abutment, a crucial tool in gingival shaping, is in direct contact with the soft tissue, and its neck design plays a pivotal role in defining the soft tissue's profile and crown. While personalized healing abutments have enhanced the gingival profile around implants, they are not without limitations. This study explores the impacts of a newly designed anatomic healing abutment on gingival soft tissue, changes in peri-implant bone morphology, and patient satisfaction. *Methods:* This study involved 30 patients undergoing implant restoration for a missing maxillary central incisor, randomly divided into a control group (15) and an experimental group (15). The experimental group received a novel anatomic healing abutment post-implantation, whereas the control group was fitted with a standard healing abutment. Crown restoration followed 2 months later for both groups. Evaluations of implant success rate, peri-implant soft tissue health, and the Pink Esthetic Score (PES) were conducted one day post-surgery (T0), and at 1 (T1), 3 (T2), and 6 (T3) months thereafter. Additionally, Marginal Bone Loss (MBL) and patient satisfaction were assessed. An independent sample t-test was utilized for statistical analysis, with a significance threshold set at $\alpha=0.05$, $P < 0.05$ denoting statistical significance. *Results:* Both groups showcased a 100% implant success rate two months post-operation. No significant variance was observed in the peri-implant soft tissue index across the four timelines ($P>0.05$). However, at T0 and T1, the experimental group exhibited significantly higher gingival papillary index and PES mean values compared to the control group ($P < 0.05$), a distinction that vanished at T2 and T3 ($P>0.05$). MBL did not significantly differ between the groups at any point ($P>0.05$). Nevertheless, Visual Analog Scale (VAS) scores significantly favored the experimental group at T0 and T1 ($P < 0.05$), with no notable differences at T2 and T3 ($P>0.05$). *Conclusion:* The deployment of a modified anatomic healing abutment for maxillary central incisor implants markedly enhances soft tissue morphology and aesthetics without compromising peri-implant bone integrity.

Keywords

Implant, Healing Abutment, Gingival Contour, Maxillary Central Incisor, Patient Satisfaction