Influence of Titanium Base, Lithium Disilicate Restoration and Vertical Soft Tissue Thickness on Bone Stability Around Triangular-Shaped Implants: A Prospective Clinical Trial

Tomas Linkevicius¹,²; Rokas Linkevicius³; Jonas Alkimavicius⁴; Laura Linkeviciene¹; Paulius Andrijauskas¹; Algirdas Puisys⁶

Abstract

Objective: To evaluate how vertical mucosal tissue thickness affects crestal bone stability around triangular-shaped bone-level implants (V3 Implants), restored with 0.5mm height Ti-bases and monolithic lithium disilicate restorations.

Material and methods: Fifty-five bone-level implants of 4.3 mm diameter were evaluated in 55 patients (22 males and 34 females, mean age 48.3 ± 3.4 years) in prospective cohort study. According to vertical mucosal thickness, patients were assigned into three groups: 1 (thin, 2 mm or less), 2 (medium, 2.5 mm) and 3 (thick, 3 mm and more). Implants were placed in posterior mandible and maxilla in one-stage approach and, after integration, were restored with single screw-retained monolithic lithium disilicate crowns, using low gingival profile titanium bases. Radiographic examination was performed after implant placement and after 1-year follow-up. Crestal bone loss was registered mesially and distally, and mean value was calculated. One-way ANOVA and Tukey’s HSD tests were applied; significance was set to 0.05.

Results: Mean vertical tissue thickness in group 1 (thin) was 1.76 ± 0.26 mm, group 2 (medium) – 2.5 mm and 3.91 ± 0.59 mm in group 3 (thick), with statistically significant difference between all groups (p < 0.001). After 1-year follow-up, implants in group 1 (thin) had 1.25 ± 0.8 mm bone loss. Implants in group 2 (medium) had 0.98 ± 0.06, while implants in group 3 (thick) lost 0.43 ± 0.37 mm of crestal bone. Tukey’s HSD test showed that differences between 1/3 and 2/3 were statistically significant (p < 0.001 and p = 0.0014, respectively), while between 1 and 2 was not significant (p = 0.310).

Conclusions: Significantly less bone loss occurs around triangular-shaped bone-level implants in thick mucosal tissues (≥3 mm), compared to medium or thin tissue biotype. Crestal bone loss did not differ between medium and thin tissues.
Intraoral radiographs in thick biotype

(a) after placement  
(b) after 1-year follow-up.

Authors’ affiliations

1Institute of Odontology, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
2Vilnius Research Group, Vilnius, Lithuania
3Department of Oral and Maxillofacial Surgery, Lithuanian University of Health Sciences, Kaunas, Lithuania
4Department of Dental and Oral Pathology, Lithuanian University of Health Sciences, Kaunas, Lithuania
5Vilnius Implantology Center, Vilnius, Lithuania