

Evaluation of Graft Requirement and Volume for Implants in the Aesthetic Zone

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Abstract

Introduction: There is no study examining the need of graft volume in implant cases in the maxillary anterior aesthetic region. In this study, we aimed to evaluate the required graft volume, providing that the facial bone wall thickness of dental implants is at least 2 mm, using SimPlant® simulation software program.

Materials and Methods: A total of 43 out of 326 dental implant patients who referred to our clinic between December 2018 and April 2019 met the inclusion criteria. Absence of a single incisor or canine teeth (Group 1), absence of a single premolar teeth (Group 2) and absence of two adjacent premolar teeth (Group 3) formed the study groups. CBCT images of 67 dental implants were examined in DICOM format. Straumann® implants with a diameter of 4.1 mm and an average length of 10 mm were placed in appropriate positions using the simulation program. The distance from the outermost surface at the level of the marginal neck of the implants to the facial bone curvature was measured with 0.3 mm intervals to the apex of the implants. Graft requirement and volume were calculated using the simulation program. A total of 4,522 measurements were performed in our study.

Results: There was no significant difference between the groups in terms of age and gender ($p>0.05$). 98.5% of the cases required bone grafting. 29.8% of the implants required more than 2 mm grafting over the facial bone wall. There was no statistically significant difference among the groups in terms of graft volume ($p=0.44$).

Discussion & Conclusion: According to our results, grafting laid over facial surface of dental implants is frequently needed in the maxillary anterior aesthetic region. Therefore, our study provides important data in terms of treatment planning before the procedure and informing the patient about the need of grafting by the dentists.

Keywords: Graft requirement.