

Assessment of 3-dimensional bone augmentation of severely atrophied maxillary alveolar ridges using patient-specific poly ether-ether ketone (PEEK) sheets



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Abstract

This study aimed to analyze the effectiveness of virtually designed polyether-ether ketone (PEEK) sheets to delineate and maintains the three-dimensional patient's maxillary alveolar ridge.

Materials and methods: Fourteen patients (34 implants) with severely atrophied anterior maxillary alveolar ridges underwent rehabilitation using custom-made CAD/CAM PEEK sheets acting as a containment system for interpositional mix of particulate autogenous and xenogeneic bone graft, fixed by mono-cortical screws. Radiographic Assessment included measurements of linear changes in the vertical and horizontal dimensions on cross-sectional cuts of computed tomography (CBCT) using special software.

Results: Wound healing was uneventful for all the patients except one patient that showed wound break down 2 weeks postoperatively, which did not affect the outcome of the procedure. CBCT scans were interpreted to compare the quantity of both vertical and horizontal bone preoperatively and 6 months postoperatively. Statistical analyses demonstrated a significant difference between the results of both time intervals, with a mean vertical and horizontal bone gain was 3.47 mm(\pm 1.46) and 3.42 (\pm 1.1) with a P-value of (.0001). The customized sheets were removed 6 months postoperative with the successful placement of dental implants.

Conclusion: The virtual planning of three-dimensional maxillary alveolar ridge augmentation utilizing patient-specific PEEK sheets deemed successful to restore the deficient ridge and to accommodate suitable size dental implants.

Biography:

Ahmed Barakat is an Head of oral and maxillofacial surgery department at the Faculty of Dentistry at Future University in Egypt

Speaker Publications:

- 1." Alveolar ridge preservation using resorbable bioactive ceramic composite: a histological study", Journal of the International Academy of Periodontology/ Volume 15 Issue 3, July 2013
- 2." Clinical and radiographic evaluation of a computer-generated guiding device in bilateral sagittal split osteotomies", Journal of cranio-maxillo-facial surgery: official publication of the European Association for Cranio-Maxillo-Facial Surgery/ Volume 42 issue 5
3. "Conventional versus computer-assisted techniques for reconstruction of orbitozygomatic fractures: a controlled clinical trial", International Journal of Oral and Maxillofacial Surgery/ Volume 42 issue 10, October 2013

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