

Ministry of Higher Education & Scientific Research
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Evaluation of Crestal Bone Loss and Alkaline Phosphatase Level in Saliva According To Different Flap Designs in Single-Tooth Dental Implant Surgery (A Comparative Study)

A thesis submitted to the council of the College of Dentistry/University of Baghdad in partial fulfillment of the requirements for the degree of Master of Science in Periodontics

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Abstract

Background: Preservation of interdental papilla and the need for esthetics are being progressively recognized as essential criteria for implant success. It is usually accepted that loss in crestal bone before loading may compromise implant success. Extensive and conserved flap designs usually used in dental implant surgery depending on including or excluding of interdental papilla of the teeth adjacent to the edentulous site. Biomarkers in saliva like Alkaline phosphatase can be used to detect the possible turnover process in the bone.

Aims of the study: To evaluate loss in the crestal bone interproximally occurring after implantation of single-tooth using 2 different flap designs. Also to assess Alkaline phosphatase level in patient's saliva with dental implant, and correlate the clinical periodontal parameters to the biochemical findings of Alkaline phosphatase.

Materials and Methods: Two Milliliter of unstimulated saliva samples and clinical periodontal recordings for the teeth adjacent to edentulous area (plaque index, gingival index, bleeding on probing, probing pocket depth and clinical attachment level) were obtained for all patients participated in this study (totally 24 patients). Participants were divided into 2 groups: group A (12 patients) treated with extensive flap design, and group B (12 patients) with conserved flap design. Saliva was sampled from each patient five times (before, 2, 4, 12 and 24 weeks after dental implant surgery). Clinical periodontal parameters were done for each patient three times (before, 12 and 24 weeks after surgery). An intraoral paralleling radiograph was taken as a baseline, to evaluate the relation between the crestal bone and the dental fixture, one day and 24 weeks after surgery. Salivary Alkaline phosphatase levels were estimated by Colorimetric Assay.

Results: Among 25 patients, one patient experienced mental nerve trauma during dental implant surgery resulting in exclusion from the whole study. The included 24 patients (19 female and 5 male) were successfully treated with dental implants. The age ranged from 21-39 years, the mean age was **30.50** years. The mean of Alkaline phosphatase before, 2, 4, 12 and 24 weeks postoperatively were **5.30, 7.04, 6.55, 6.19, 5.40** respectively in extensive flap design, while for conserved flap design were **5.15, 6.95, 6.38, 5.95, 5.28** respectively. The mean of crestal bone loss on the mesial and distal sides in extensive flap were **0.46, 0.45** respectively, while for conserved flap were **0.17, 0.15** respectively. This study have presented that flap reflection can result in more crestal bone loss during the healing period.

Conclusions: Within the restrictions of this study, it may be concluded that the loss in the crestal bone interproximally was of practical importance and statistically significantly less subsequent to the use of a conserved flap design when compared with the extensive flap procedure. Also Alkaline phosphatase may be considered useful as a potential marker for bone turnover process.