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University of Baghdad
College of Dentistry

Evaluation of Keratinized Tissue Width and Mucosal Thickness around Dental Implants Using Leukocyte-Platelet-Rich Fibrin (A Split-Mouth Randomized Clinical Trial)

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: Dental implant is considered the most reliable method to replace missing teeth in partially and fully edentulous patients. While many factors determine clinical success, the keratinized mucosa and soft tissue thickness around dental implants play an important role in both esthetics and the maintenance of peri-implant health. Most of the studies focused on augmenting the peri-implant mucosa with autogenous soft tissue grafts (free gingival graft and subepithelial connective tissue grafts) to have thicker soft tissue and increase the keratinized mucosa width around dental implants. Another trial to influence the peri-implant soft tissue is the use of leukocyte-platelet-rich fibrin which is a second-generation platelet concentrate consisting of fibrin matrix enriched with platelets and growth factors.

Aims: To determine the influence of leukocyte-platelet-rich fibrin placed during implant insertion on keratinized tissue width and soft tissue thickness around dental implants.

Materials and Methods: This randomized clinical trial with a split mouth design included 7 patients (4 females and 3 males) received 24 dental implants inserted in conventional protocol. Each patient has received at least 2 implants that were randomly assigned into 2 groups, one with leukocyte-platelet-rich fibrin placement (to be included in study group) in which leukocyte-platelet-rich fibrin clot was placed after implant insertion, and the other without leukocyte-platelet-rich fibrin (to be included in control group). The soft tissue thickness was measured at three points (buccally, crestally and lingually/palatally) by transgingival measurement using endodontic reamer with a stopper, then the distance from the tip of the reamer to the stopper was measured by a digital vernier caliper, and this distance represents the soft tissue thickness. The keratinized tissue width (the distance from the mucogingival junction to the crest of soft tissue) was measured by the digital vernier caliper. These measurements were done at baseline visit

and repeated at first visit (after 1 month from baseline) and at second visit (after 6 months from baseline).

Results: There was a non-significant increase in keratinized tissue width in study group at first visit and a significant decrease at second visit, while there was a non-significant decrease at first visit and a significant decrease at second visit in control group, with no significant difference between the two groups as the means for the study group were **4.24 mm**, **4.34 mm** and **3.31 mm** for baseline, first visit and second visit respectively and for the control group were **4.07 mm**, **4.05 mm** and **3.21 mm** for baseline, first visit and second visit respectively. For soft tissue thickness, there was a significant increase in both groups after 1 month at all the three points with no significant difference between groups, then a non-significant decrease occurred after 6 months in study group, while for the control group, a significant decrease occurred after 6 months at all the three points with no significant difference between groups. The means of the buccal point for the study group were **2.98 mm**, **3.65 mm** and **2.67 mm** and for the control group **2.84 mm**, **3.25mm** and **2.59 mm**, crestal point for the study group **3.18 mm**, **3.61mm** and **2.86 mm** and control group **3.19 mm**, **3.53mm** and **2.70 mm** and lingual/palatal point for the study group **2.94 mm**, **3.51mm** and **2.67 mm** and control group **2.88 mm**, **3.10 mm** and **2.43 mm** for baseline, first visit and second visit respectively.

Conclusion: Leukocyte-platelet-rich fibrin resulted in increased keratinized tissue width and soft tissue thickness after 1 month, while there was a reduction after 6 months. However, this reduction was non-significant in study group compared with a significant decrease in control group in soft tissue thickness which may suggest a beneficial effect of leukocyte-platelet-rich fibrin in this term.

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