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**Assessment of Implant Stability Changes and
Survival Rate of Narrow Dental Implants and The
Accuracy of Ridge Mapping Technique in
Measurement of Alveolar Ridge Width**

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the University of Baghdad, in partial fulfillment of requirements
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Abstract

Background: Narrow dental implants are indicated in patients with insufficient alveolar bone width and restricted mesiodistal span as an alternative option of bone augmentation. Measuring the dimensions of the available bone before implant surgery is an important aspect of diagnosis and treatment planning. Ridge mapping technique is an option for determining alveolar ridge width.

Aims of the study: To assess the survival rate and implant stability changes of narrow dental implants during the osseous healing period and to evaluate the accuracy of ridge mapping procedure in measuring the alveolar ridge width and to determine the effect of some predictor variables (age, gender, functional implant zones, bone density (according to Leckholm & Zarb classification), implant dimensions (diameter and length) and smoking habit) on narrow dental implants stability.

Materials and Methods: This prospective observational clinical study included 21 patients who received 54 narrow dental implants. An acrylic stent fabricated for each patient provided two buccal/lingual reference points for ridge mapping. The measurements obtained from ridge mapping were compared with direct measurements of the alveolar ridge width after flap reflection. After implant placement, primary stability was measured using Periotest[®] M, then after 4, 8 and 12 weeks postoperatively. The statistical analysis included unpaired *t*- test, one way analysis of variance (ANOVA) and Fissure's Exact Probability Test (F.E.P.T), values <0.05 were considered statistically significant.

Results: The survival rate of narrow dental implants was 92.6%. The implant stability was significantly reduced at 4 weeks compared with primary stability, at 8 weeks it significantly increased compared with that at 4 weeks and at 12th weeks, the stability increased significantly compared to that at 8 weeks. The difference between the primary stability and after 12 weeks was statistically non-

significant. The difference between ridge mapping technique and intra-operative measurement in determining alveolar ridge width was statistically non-significant. The correlation between predictor variables and dental implant stability was not significant in most instances probably due to the small sample size of this study.

Conclusions: Narrow dental implants represent a viable option to replace missing teeth in cases of narrow alveolar ridges and restricted mesiodistal distance with high early survival rate. During the healing period, implant stability drops significantly in the first 4 weeks postoperatively, and then increases steadily in the following weeks to reach to a level close to that of primary stability after 12 weeks. Ridge mapping is a method that provides reliable immediate data concerning the width of alveolar ridge before implant surgery. Implant stability during the healing period was not affected by age, gender, functional implant zones, bone density, implant dimensions and smoking habit. Given the association of complications and failure rate of narrow dental implants with Type I bone density that were observed in this study, it is recommended that narrow dental implants should be considered with caution in dense bone.