PRIMARY IMPLANT STABILITY IN AUGMENTED ANTERIOR MAXILLA USING SEGMENTAL INLAY GRAFTING TECHNIQUE

Mona Samy Elhadidy*, Ahmed Barakat**, Mohamed Monier*** and Adel Abou Elfetouh***

ABSTRACT

Objectives: The aim of this paper is to estimate the primary implant stability in augmented anterior maxilla using palatal approach inlay grafting.

Patients and Methods: Nine patients were selected. All patients underwent palatal approach utilizing segmental osteotomy for the bone of the anterior maxilla and insertion of alloplastic bone block as grafting material. Four months later the bone gain was measured and compared and implant insertion was done. The implant primary stability was measured using Osstell.

Results: There was adequate primary implant stability in all augmented regions.

Conclusion: Segmental sandwich osteotomy technique is an effective technique for augmentation of the anterior maxilla. The grafted alveolar ridge provided adequate primary implant stability.

KEYWORDS: (segmental osteotomy, sandwich osteotomy, anterior maxilla, inlay, vertical deficiency, primary stability)

INTRODUCTION

Rehabilitation of missing teeth in the anterior maxilla by implant supported restoration while achieving proper esthetics and function is considered a challenging condition. Basic requirements for an optimal final restoration include adequate bone support and sufficient healthy soft tissue. (Laviv, Jensen, Tarazi, & Casap, 2014)

A new approach of segmental sandwich osteotomy technique using palatal flap instead of the buccal one to overcome the force created by the tough palatal tissue and to allow for proper labial prominence. (Bell, 2013) Therefore, the aim of this study was to compare the vertical augmentation achieved at the anterior maxilla via a sandwich osteotomy approached through labial versus palatal flaps.

* Assistant lecturer in Oral and Maxillofacial Surgery department. Faculty of Dentistry, Cairo University
** Professor of Oral and Maxillofacial Surgery department. Faculty of Dentistry, Cairo University
*** Lecturer of Oral and Maxillofacial Surgery department. Faculty of Dentistry. Cairo University
MATERIALS AND METHODS

Nine patients were selected from the outpatients clinic of the Oral and Maxillofacial Surgery department, Faculty of dentistry, Cairo University. The patients underwent segmental vertical ridge augmentation using palatal approach.

Preoperative preparation:

Horizontal dimensions: were initially determined by a graduated caliper to ensure sufficient ridge width. A cone beam CT scan was then done as a final investigation for assessing the vertical dimension of the deficient alveolar ridge.

Intervention:

1st stage:

Ridge augmentation:

Palatal incision was done just palatal to the crest of the ridge. The horizontal osteotomy was performed using a Tungsten carbide disc, while the two vertical osteotomies were performed using a very thin fissure bur. The gap was filled with alloplastic bone graft (nanoparticulate bone graft) and secured in place using mini/micro-plates and mini/micro-screws. Figure 1.

2nd stage:

Implant placement and Implant Stability Quotient (ISQ) measurement:

Implants selection and insertion were done according to the final achieved height of the augmented ridge. The SmartPeg of the Resonance frequency analysis device was mounted on the top of the implant. The Resonance frequency analysis device measuring probe was directed toward the SmartPeg from two directions perpendicular on each other (mesio-distal & bucco-lingual). The ISQ value was displayed on the Resonance frequency analysis device screen measuring the resonance frequency of the SmartPeg which is attached to the implant. Figure 2.

RESULTS

All implant sites showed adequate implant stability at sites of bone augmentation with values showed in table 1.

Fig. (1) Augmentation of anterior maxilla using palatal approach.

Fig. (2) Measuring probe of Osstell to measure implant stability.
TABLE (1) Show results of implant stability at augmented sites.

<table>
<thead>
<tr>
<th>Pt. number</th>
<th>Implant stability</th>
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<tbody>
<tr>
<td>1</td>
<td>72</td>
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<tr>
<td>2</td>
<td>70</td>
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<td>73</td>
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**DISCUSSION**

Implant stability using resonance frequency analysis device high primary implant stability readings. According to Rao and Gill review; one main factor in providing primary implant stability is the bone quality and quantity. *(Rao & Gill, 2012)* which in turn indicates success of the interpositional grafting technique in providing high bone density and amount that enhance implant anchorage and osseointegration. *Dottore et al.* comparative results, between two groups augmented with sandwich osteotomy technique and grafted in a group with autogenous bone and the other with alloplastic material, showed no significant difference in the primary implant stability measured by resonance frequency analysis device. *(Dottore et al., 2014)*

From the present study and *Dottore et al.* study; we can conclude that regardless the graft material and the approaching flap, sandwich osteotomy technique is a good one in providing proper augmentation technique that enhancing high implant stability.

**CONCLUSION**

Segmental sandwich osteotomy technique is an effective technique for augmentation of the anterior maxilla. The grafted alveolar ridge provided adequate primary implant stability.

**REFERENCES**


