

The Role of Keratinized Mucosa to Maintain the Peri-Implant Health: A Case Report after Five Years Follow-Up

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Received: May 26, 2017; Accepted: June 20, 2017; Published: July 21, 2017

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Abstract

A variety of surgical techniques have been proposed to increase the width of keratinized mucosa around dental implants. One of the major procedures is the roll flap technique, which is considered as a predictable therapeutic option. A 19-year-old female patient was referred for soft tissue management around an osseointegrated implant placed to substitute the lateral upper left incisor. Clinical examination showed a lack of keratinized mucosa even around an osseointegrated implant on the contralateral site. A roll flap technique was used to treat the soft tissue defect around the left implant site. Five years after surgery, the soft tissue margin of the left implant site, conversely to the right site (At which the gingival augmentation was not unfortunately performed), was stable and the esthetic appearance was well maintained. The purpose of this paper was to demonstrate the role of keratinized mucosa in regards to maintaining peri-implant health. The difference of the soft tissue was evident between the treated and the not treated implant sites. Thus, keratinized mucosa appears to have an impact on peri-implant health.

Key Words : Gingiva; Dental implants; Inflammation;

Introduction

To date, there is no general consensus with respect to the amount of soft-tissue volume needed for functional purposes on the buccal aspect of dental implants. Numerous studies have examined the relationship between the width of keratinized mucosa and the health of peri-implant tissues [1]. The necessity of the presence of keratinized mucosa around dental implants continues to be controversial [1-6]. However, an increase in the width of keratinized tissue may be considered in order to simplify patient's oral hygiene and to maintain the mucosal tissue level [1]. This report illustrates a successful soft tissue management

around an osseointegrated implant using a roll flap technique [7].

Case Presentation

A 19-year-old, systemically healthy female presented for soft tissue management around an osseointegrated implant placed to substitute the lateral upper left incisor. (Figure 1)

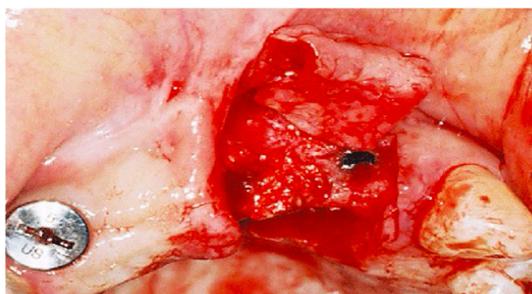


Figure 1: Initial view of the implant sites: thin buccal keratinized mucosa showing by transparency the underlying implant surfaces.

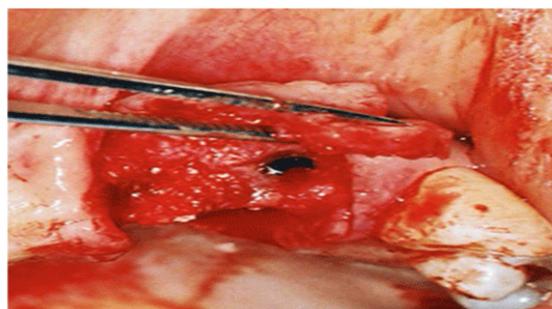
Clinical examination showed a completely submerged implant on the lateral upper left incisor site and another implant with a healing screw on the contralateral site. The two implants were too facially positioned and the buccal soft tissue was so thin that the underlying implants surfaces were visible through the tissues. The soft tissue defect of the left implant site was treated with a roll flap technique. Following local anesthesia, the gingival surface of the palatal implant site was de-epithelialized in a trapezoid and a split-thickness pedicle with de-epithelialized connective tissue was made by a No. 15 scalpel blade. The vertical



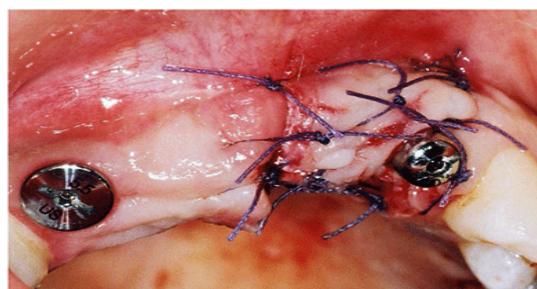
(a)



(b)



(c)



(d)

Figure 2: (a) the gingival surface of the palatal implant site was de-epithelialized in a trapezoid and a split-thickness pedicle with de-epithelialized connective tissue was made by a No. 15 scalpel blade. The vertical palatal incisions were extending to the buccal aspect of the implant site. (b,c) The resulting buccal flap was elevated with a split-thickness in the coronal-apical direction and the de-epithelialized connective tissue pedicle raised from palate using sharp dissection was rolled and placed in the buccal surface; (d) vertical incisions were fixed by interrupted resorbable sutures. Horizontal mattress sutures were performed on the mesial and distal aspect of the implant to allow a closure of the site

palatal incisions were extending to the buccal aspect of the implant site. (Figure 2a) The resulting buccal flap was elevated with a split-thickness in the coronal-apical direction. The de-epithelialized connective tissue pedicle raised from palate using sharp dissection was rolled, placed in the buccal surface of the implant creating a thicker amount of buccal tissue and secured with interrupted resorbable sutures. Horizontal mattress sutures were performed on the mesial and distal aspect of the implant to allow a closure of the site. (Figure 2 b,c, d) A healing screw then replaced the cover one in order to give the implant-supported crown a correct emergence profile. Post operatively, the patient was prescribed analgesic (paracetamol three times a day for three days) to pain control and she was advised to rinse with 0.12% chlorhexidine gluconate mouth wash twice daily for one week. Seven days later, the sutures were removed. Five years after surgery, the soft tissue margin of the left implant site was stable and the esthetic appearance was well maintained and no signs of mucositis or peri-implantitis were present. Conversely to the right site (which was not treated), the gingival margin showed signs of inflammation (Figure 3).



Figure 3: 5 years post-surgery. The soft tissue margin of the left implant site was stable and the esthetic appearance was well maintained and no signs of gingival inflammation were present. Conversely to the right site (which was not treated), the gingival margin showed sign of inflammation.

Discussion

The increased esthetic demands requires the peri-implant soft tissue color and contour to be in harmony with the adjacent teeth for the patient satisfaction, thus, surgical reduction of the peri-implant soft tissue defect may be indicated. While surgical reconstructive procedures have been used for the improvement of soft tissue defects prior to implant placement, the preservation of appropriate soft tissue architecture around osseointegrated implants remains challenging, especially when the implants are not inserted in a proper position [8]. Controversy exists in the literature with respect to the question of whether or not there is a need to augment the keratinized mucosa around implants in patients with a lack of width [9]. Roll flap technique is an original soft tissue augmentation procedure, which involves a de-epithelialized connective tissue pedicle flap [6, 7]. Advantages of

this technique include maintaining the color and texture of the surrounding tissues, and requiring only single operative site. However, this technique is indicated only for the defect of mild severity due to limited supply of donor tissue [1]. The goal of the treatment in the present case was to increase buccal soft tissue thickness to mask the implant and to make oral hygiene easier for the patient [10]. This procedure completely solved the peri-implant soft tissue defect. In fact, at 5 years, the peri-implant soft tissue margin was stable, and the increase in buccal soft tissue thickness allowed for masking of the implant. Whereas under similar plaque control, gingival margin inflammation was noted only on the untreated implant site. This supports the role of keratinized mucosa to maintain the peri-implant health. It was previously demonstrated by Chung et al [6]; who found in their study that the absence of adequate keratinized mucosa was associated with higher plaque accumulation and gingival inflammation. The results of this study are consistent with a cross sectional study by Bouri et al [4] that reported that increased width of keratinized mucosa (≥ 2 mm) around implants is associated with lower mean alveolar bone loss and improved indices of soft tissue health. Wider zones of keratinized mucosa may lead to more resistance to the forces of mastication and frictional contact that occur during oral hygiene procedures [4] Levine et al [1] concluded in their systematic review that for some patients a lack of keratinized mucosa may be a risk factor for one or more issues: plaque accumulation, tissue soreness while brushing, gingival inflammation, recession, bone loss, and esthetics. Regarding esthetics in the anterior maxilla, Zigdon and Machtei [5] reported in their retrospective clinical trial that the keratinized mucosa thickness and width around dental implants affects both the clinical and the immunological parameters at these sites. A negative correlation was found between mucosal thickness and marginal recession. Likewise, keratinized mucosa width showed a negative correlation with marginal recession, periodontal attachment level and prostaglandin E2 (PGE2) levels. Despite the impact of keratinized gingiva on maintaining the peri-implant health remains controversial, it is certainly important from a clinical perspective. The presence of adequate amount of keratinized tissue makes it easier for the patient to perform oral hygiene [11].

Conclusion

Within the limits of this clinical case report, a roll flap technique seems to be effective to increase buccal soft tissue thick-

ness to mask the implant. The role of keratinized mucosa to maintain the peri-implant health was demonstrated by the difference between the two implants gingival margin.

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