



## Augmentation of Keratinized Tissue Around Implants

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### Abstract

There is a lack of consensus about the amount of necessary keratinized tissue surrounding implants. Regarding to this to the clinician must be able to individualize each case and determine if it is necessary to proceed with a soft tissue augmentation. After a short and historic review of the literature regarding this issue we are presenting two clinical cases where soft tissue augmentation procedures were performed

**Keywords:** Soft Tissue; Implants; Augmentation; Mucogingival; Width of Keratinized Tissue

### Introduction

The term keratinized tissue was firstly introduced in the decades of the sixties and seventies. At that stage authors like Nabers (1966) and Sullivan and Atkins (1968) concluded that determined amount of keratinized tissue is mandatory in order to maintain periodontal health and prevent future possible recessions.

Few years later, Lang and L oe (1972) concluded that the minimal amount of keratinized tissue should be 2mm, this statement promoted the development and improvement of new techniques of augmentation of keratinized tissue [1-5].

An histological study of the periimplantary tissues shows a lower blood flow when compared with periodontal tissue of natural teeth. Other remarkable differences between tissues surrounding dental implants and teeth is the absence of perpendicular fibers of the former, finding only oblique and parallel fibers [6]. These histological differences are the responsible of some clinical differences in implants like an augmented physiological periodontal probing and a weaker barrier for bacteria, which can lead to clinical consequences like loss of insertion around implants and gingival recession.

Actually it still being controversy about the necessity or not of periimplantary keratinized tissue. On one hand there is studies that stands for a direct association between width of keratinized tissue, higher rates of survival, periimplantary health and improved aesthetics [7-9]. On the other hand other authors supports that there is not direct association between gingival recessions and amount of keratinized tissue around implants.

Recent studies justifies the treatment with mucogingival techniques around implants for an augmentation of keratinized tissue and volume [12]. Those studies had been done using animal models [13] and human [14,15] and concluded that exists a direct association between loss of bone height and gingival recession in those cases showing a lack of periimplantary keratinized tissue.

Even with a lack of consensus regarding this issue, the lack of keratinized tissue around implants is recognized as a risk factor for the following clinical conditions [16,17]:

- Larger accumulation of plaque.
- Discomfort when brushing, leading to periodontal problems.
- Gingival recessions.

So, as it happens with periodontal tissues there is a lack of universal criteria for augmentation of keratinized tissue surrounding implants, and it will be necessary an exhaustive study of the case and the individualization. For selecting the potentially candidates for this procedures is mandatory to evaluate the following features:

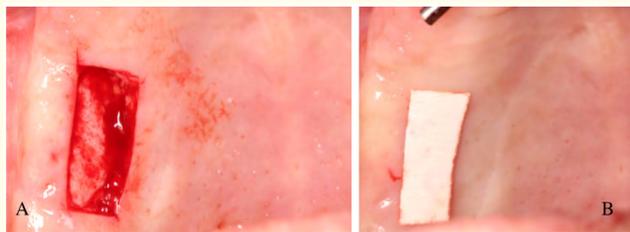
- Persistent swollen areas which requires to modify the gingival biotype.
- Areas showing progressive loss of insertion after periodontal therapy.
- Areas showing difficulties or discomfort to the patient while using appropriate hygiene techniques.
- Patients or with predisposition to gingival recession due to the thin gingival biotype.
- According to this scientific background and after the individualization of each single case, we are presenting two clinical cases which required of an augmentation of keratinized tissue around implants.

**Materials and Methods (Clinical Cases)**

**Case 1**



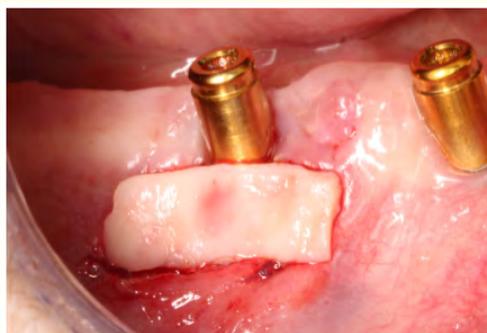
**Figure 1:** Initial situation. Total absence of keratinized tissue at the buccal face promoting discomfort and the beginning of the retraction.



**Figure 3a and 3b:** Palatal donor site.



**Figure 4a and 4b:** A graft of 13x6 mm with 1,5 mm of thickness was obtained.



**Figure 5:** Graft placed over the recipient area in order to check the dimensions.



**Figure 2:** Preparation of the recipient area. A partial thickness flap was released and repositioned to achieve a vestibular deeping.



**Figure 6:** Suture. The aim of the suture was to fix the graft to the area and the repositioned flap (17). After the suture pressure was applied in the area for 4 minutes.



**Figure 7a and 7b:** Fifteen days post-op follow up. Complete integration of the graft was observed.



**Figure 8:** Forty-five days post-op follow up. Note the gain of volume and keratinized tissue around the treated area.

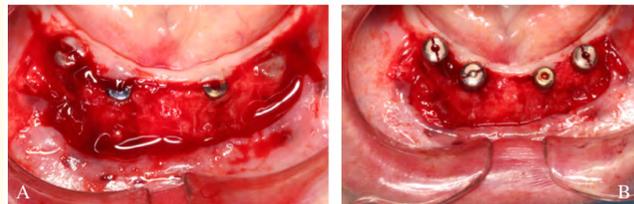
Male patient without any medical condition who was referring discomfort and impossibility to maintain an appropriate hygiene in the surrounding area of implant located in position 44.

**Case 2**

68 years old female, non smoker and without any medical condition. After the placement of implants and once the process of osseointegration had been concluded to perform a vestibular deepening and an augmentation of surrounding keratinized tissue around implants was mandatory in order to improve the final result of the implant supported restoration.



**Figure 9a and b:** Initial situation. Note the complete lack of keratinized tissue and lack of vestibular deep. The approach for this case was to perform the vestibular deepening simultaneously with free gingival grafts and placement of healing abutments.



**Figure 10a and b:** A partial thickness flap was released. Note that it was necessary to extend the surgical area in order to be able to reposition the flap laterally. After releasing the flap healing abutments were placed.



**Figure 11:** Suture of the free gingival grafts. The principal aim of this suture was to fix the graft to the recipient area. Note that the flap was also repositioned apically in order to achieve a vestibular deepening.



**Figure 12a and b:** Seven days post-op. Healing was correct in the recipient area and at the donor site also. At this moment sutures from the donor site were removed



**Figure 13:** Fifteen day post-op follow-up. Note the revascularization of the graft. At this moment non-submerged sutures were removed.



**Figure 14:** Twenty one days post-op check-up.



**Figure 15:** Forty-five days post op check-up. Notice the increased vestibular deep and the keratinized tissue surrounding the implants.

## Results and Discussion

### Conclusion

Free gingival grafts are an appropriate clinical approach to treat lack of keratinized tissue surrounding implants. The use of this techniques prevents from clinical conditions directly associated with an unhealthy periodontal tissue such as inflammation and recession.

### Conflict of Interest

There is no economical interest in this publication.

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