Case Report

A modified free gingival graft technique for gaining vertical and horizontal soft tissue augmentation

Marcelo Hissao Imano, Emanuelle Juliana Cunha,[1] Carmen Lúcia Mueller Storrer,[1] Tatiana Miranda Deliberador[1]

Odontologia, São Leopoldo Mandic School, [1]School of Health Sciences, Universidade Positivo, Curitiba, Parana, Brazil

Abstract:

The aim of this case report was to describe a modified free gingival graft technique for gaining vertical and horizontal soft-tissue growth in the posterior region of the mandible before installation of dental implants. Patient A.A., a 38-year-old female, received a modified free gingival graft in the posterior region of the mandible. After 90 days, an increase, both horizontally and vertically, of the gingival tissue was observed, and the patient was satisfied with the result. The dental implant was installed, and a 3-mm of the vertical gain of keratinized gingiva was observed. Further research is needed to evaluate the effectiveness of this technique before prosthetic dental implantation.

Key words:

Grafts, implants, keratinized mucosa, soft tissue

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INTRODUCTION

The absence of adequate keratinized gingiva is associated with increased plaque accumulation, bleeding with probing, and gingival inflammation, as well as compromised esthetics. Several surgical techniques have been implemented for the repair of the tissue. Both connective tissue and free gingival grafts are used to increase keratinized mucosa and the area of tissue around the dental implant.[1-3]

Beginning in the mid-1960s,[1] free gingival grafts have been the optimal technique for increasing vestibule extension and keratinized tissue width, demonstrating a reliable clinical procedure.[2-7]

The increase of mucosal thickness after gingival graft surgery has been well documented in the literature. Previous studies have shown that the presence of keratinized tissue around implants is directly correlated to success of osseointegrated implants, facilitating restorative procedures, esthetics, and allowing the maintenance of gingival health.[3,4]

Some studies have noted that the morphogenesis and inflammation of the mucosa surrounding the implants may facilitate bone loss.[8,9] According to Abrahamsson *et al.*,[10] the formation of angular bone defects was found around implants when they were placed in thin gingival tissue.

This article reports a clinical case in which a modified technique of the free gingival graft was performed to gain vertical and horizontal soft-tissue growth in the posterior region of the mandible before installation of a dental implant.

CASE REPORT

Patient A.A., a 38-year-old, non-smoking female, with leukoderma, who is otherwise systemically healthy, reported with a chief concern of dental absence and the desire for reconstruction with dental implants.

During the anamnesis and the periodontal clinical examination, it was revealed that the patient was in good gingival health. The absence of tooth 34 and marginal level of keratinized gingiva was observed [Figure 1]. The keratinized gingiva was measured with an endodontic file and cursor to have a height of <2.0 mm.

Considering the presence of little peri-implant keratinized gingiva, the treatment plan implemented the use of a modified free gingival

Address for correspondence:
Prof. Tatiana Miranda Deliberador, Universidade Positivo, Curitiba, Parana, Brazil.
E-mail: tdeliberador@gmail.com

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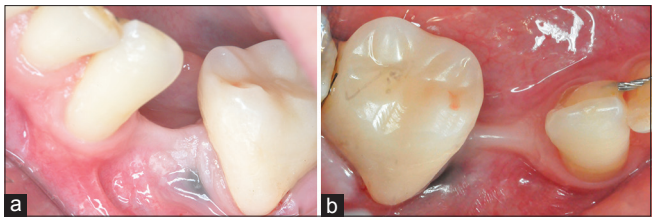

Figure 1: (a) Vestibular and (b) occlusal view showing the small amount of keratinized gingiva

Figure 3: Vertical incision made in the mesial

Figure 5: Papilla of teeth 33 and 36 preserved

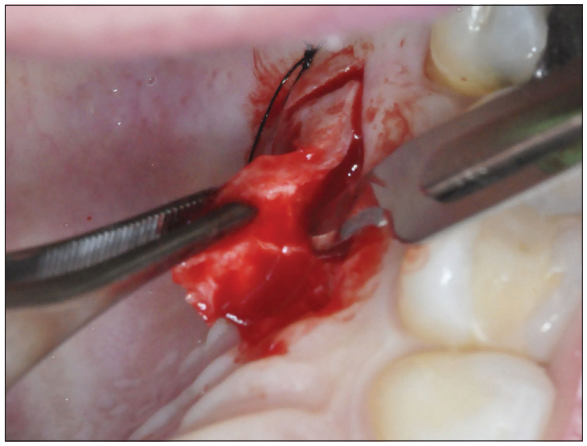

Figure 7: Harvesting graft from the palate

Figure 2: Horizontal incision below the mucogingival line and the bony crest

Figure 4: Vertical incision was made in the distal

Figure 6: A partial thickness flap was performed in the buccal region of the mandible

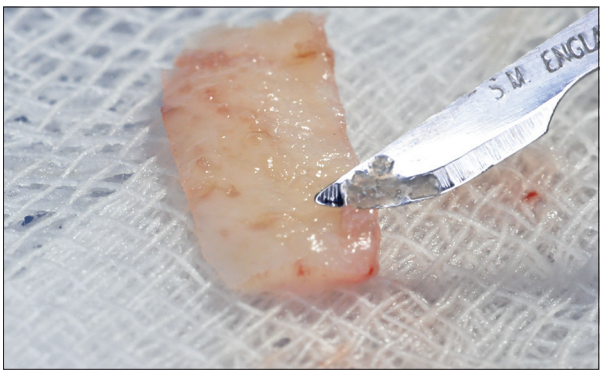

Figure 8: Removal of the epithelium tissue from part of the free gingival graft with the aid of a 15C scalpel blade

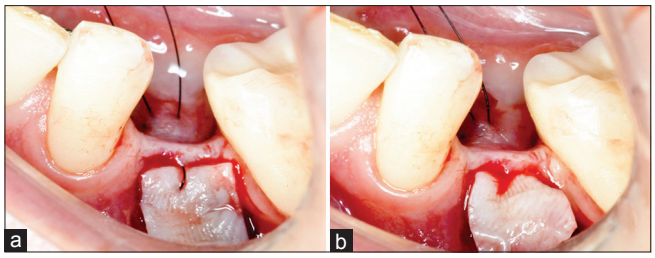

Figure 9: (a) Suture starting in the lingual mucosa, passing through the de-9:epithelized graft and returning to the lingual mucosa, the graft is tractioned by the suture under the mucosa of the osseous ridge; (b) part of the epithelized graft covers the partial thickness flap on buccal side

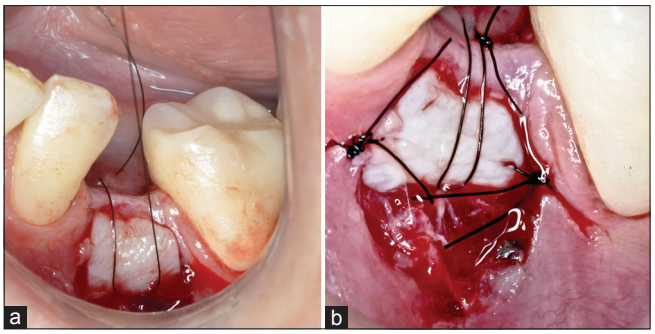

Figure 10: (a) A compression suture and (b) two simple mesial and distal sutures were made for the graft stabilization

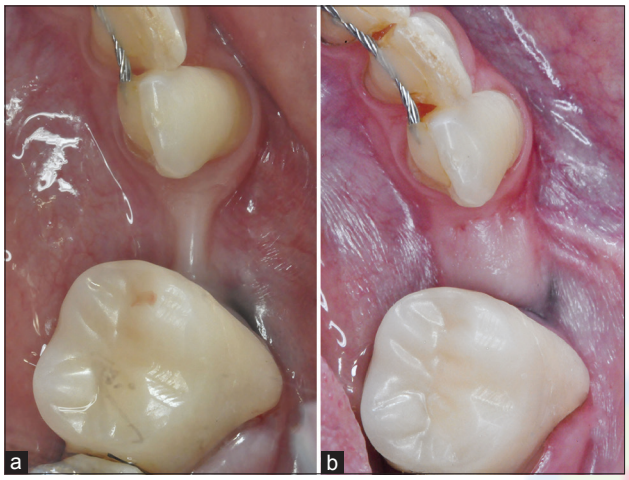

Figure 11: Occlusal view of the keratinized gingiva thickness (a) before the surgical procedure and (b) after 90 days

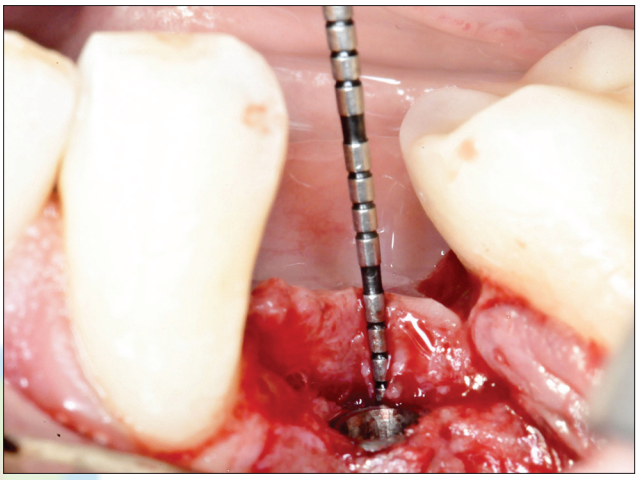

Figure 12: After 90 days, a vertical increase of the gingiva was observed after implant installation

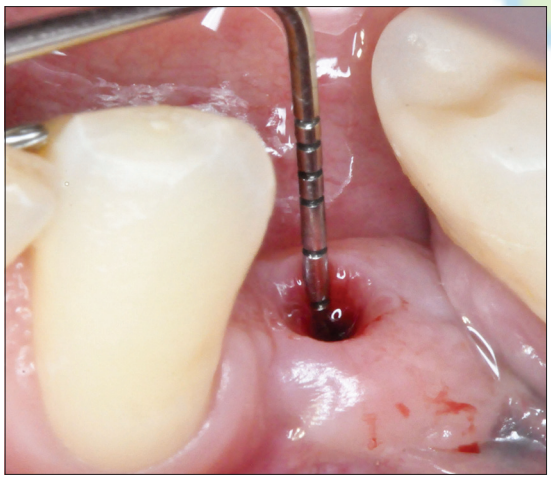

Figure 13: Thickness and height of the keratinized tissue remained unchanged after installed healing cap

graft technique to obtain both a vertical and horizontal increase of keratinized gingiva before the installation of the dental implant.

After an aseptic and antiseptic procedure, the patient was anesthetized locally with articaine 4% 1:100.000 (Nova DFL, Rio de Janeiro, Brazil). A horizontal incision was made under the bony crest of the edentulous space just below the mucogingival line [Figure 2]. Two vertical incisions of approximately 4 mm were made, one in the mesial [Figure 3] and one in the distal area [Figure 4] of the edentulous space. The incision began in the mucogingival line toward the bottom of the vestibular mucosa, with the aid of a 15C scalpel blade. The papilla was preserved [Figure 5]. A full thickness flap was made on the bony crest toward the lingual mucosa. Care was taken to avoid perforation and to maintain a free space between the mucosa and the bony crest. A partial thickness, 5 mm flap was made on the vestibular mucosa [Figure 6].

The free gingival graft was removed from the palate region between 2.0 mm–3.0 mm thickness and 30.0 mm of length [Figure 7]. Before placement in the recipient bed, one part of graft was cascaded (epithelial tissue was removed) [Figure 8] is the modification of the classical technique of free gingival grafting. The graft was positioned to cover the entire surgical area. The bony crest portion of the deepithelialized graft was enveloped with the aid of a horizontal mattress suture under the flap [Figure 9]. Compression sutures were made to stabilize the graft on the vestibular region of mandible [Figure 10].

To protect the palate region and for greater comfort, to the patient, an acetate plate was made. As postoperative medication, amoxicillin 500 mg 8/8 h for 07 days, and ibuprofen 400 mg 8/8 h for 03 days were prescribed. The patient was instructed to rinse the surgical site with 0.12% chlorhexidine-digluconate solution twice a day, for 1 week.

At the 10-day postop appointment, the sutures were removed, and healing of the surgical site was evident.

After 90 days, an increase, in keratinized tissue was observed both horizontally and vertically, making the site more suitable to receive the dental implant [Figure 11]. A new gingival measurement was performed using a millimeter probe during installation of the implant, more than 3.0 mm of keratinized mucosa height was observed [Figure 12]. The implant was installed with the healing cap, and the patient was instructed to return for a follow-up appointment after 30 days, and it was observed that the thickness and height of the keratinized tissue remained unchanged [Figure 13].

DISCUSSION

The free gingival graft technique is a successful and predictable technique implemented for many years to promote keratinized gingiva augmentation, which prevents both hard and soft tissue problems after implant rehabilitation.[5-7]

However, this technique involves two surgical sites that could cause pain and discomfort. Moreover, discrepancies in color and texture with the surrounding mucosa and some percentage of shrinkage can result in a nonesthetic outcome.[5-7] This case report describes a modification of the free gingival grafting technique to increase the gingival soft tissue in the posterior region of mandible, in all directions, before dental implant installation. With this modification, part of the graft is deepithelialized and inserted under the mucosa of the bone crest for vertical gain; the other part is placed on the vestibular flap, to facilitate the horizontal keratinized mucosa growth. This technique has not been described in the literature. It has an advantage over the classical technique of the free gingival graft because as part of the graft is on the bone crest; this promotes the tissue gain in the vertical and horizontal direction.

Many studies have reported that an adequate width of keratinized mucosa is vital for maintaining gingival health. A thicker keratinized mucosa provides better oral hygiene that leads to a reduction of plaque accumulation, inflammation, bleeding, and gingival recession.[2,4] Vertical and horizontal mucosal tissue thickness is critical to the proper installation of implants as thicker mucosal tissue can prevent early bone crest loss and offer a favorable environment for prosthetic implants due to the increase in stability of the peri-implant area. It also allows for adequate oral hygiene maintenance by the patient.[8-10]

CONCLUSION

Many studies have already shown the importance of keratinized gingiva associated with the installation of dental implants. This case report showed that modified free gingival graft technique proved to be favorable for gain both vertical and horizontal soft tissue. The results demonstrated the maintenance of keratinized tissue even after the implant healing site. However, further research is needed to evaluate the definite effectiveness of this method before dental implants.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that their name will not be published and due efforts will be made to conceal identity but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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