

## Case Report

## The Case for Using Free Gingival Grafts in the Anterior Mandible: Clinical Case Reports

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### ABSTRACT

Although, free gingival grafts (FGG) are considered to be one of the most predictable procedures for increasing keratinized tissue around teeth, it still has drawbacks mainly because of the colour mismatch between the grafted site and the surrounding gingiva, and the increased morbidity due to the necessity of having two surgical sites, a donor site where we harvest the graft and a recipient site. Several attempts were made to replace free gingival grafts with techniques that offer better esthetics such as subepithelial connective tissue graft placed through a tunnel or a coronally advanced flap, or techniques that also offer less morbidity to the patient such as the use of guided tissue membranes or acellular dermal matrix as a replacement for palatal tissue. And although root coverage can be achieved predictably through many of these techniques, free gingival grafts still have its place in modern dentistry. These two cases demonstrate how free gingival graft would be the best choice to treat cases with lack of keratinized tissue in the anterior mandible, especially in the presence of shallow vestibule and high frenal attachment.

**Key words:** Anterior Mandible, Free Gingival Graft, Frenal Attachment.

Although focus have shifted from doing free gingival grafts to using alternative methods such as the use of subepithelial connective tissue grafts,<sup>[1]</sup> Guided tissue regeneration membranes,<sup>[2]</sup> and Acellular dermal matrix grafts,<sup>[3]</sup> to name a few. Free gingival grafts still have their place in treating mucogingival problems around teeth and implants. Free gingival graft (FGG) was first described in the literature in 1968 by Sullivan and Atkins<sup>[4]</sup> and has remained one of the most predictable techniques for gingival augmentation until this day. Long-term outcomes of using free gingival grafts to increase keratinized tissue was evaluated in a study,<sup>[5]</sup> where they followed up 100 patients with a total of 224 sites showing recession and complete lack of keratinized issue.

In this study all patients received free gingival grafts to augment their gingiva. The authors reported an increase of

4.2 mm of keratinized tissue and 0.8 mm of coronal creep at one year follow up and overall decrease in keratinized tissue of 0.7 mm and a coronal creep of 0.6 mm at 10 to 25 years follow up. This study concluded that free gingival grafts yield a long-term increase in keratinized tissue and decrease of recession around teeth.

Attempts were made to use acellular dermal matrix (ADM) as an alternative to free gingival grafts to decrease morbidity by avoiding harvesting tissue from the palate. However, free gingival graft remains superior to ADM as shown in a study by Cevallos et al.<sup>[3]</sup> where they followed up 12 patients for a period of 15 years and found that while ADM group showed increased recession depth over time, free gingival graft group showed creeping attachment amounting to 17.6% with significant decrease in recession depth and gain in keratinized tissue.

It was also suggested that harvesting a smaller graft from the palate would result in less post-operative pain. One study described the accordion technique where smaller grafts were harvested and extended up to 50% in length through definite incisions patterns.<sup>[6]</sup> However, in another study it was found that there was no difference in post-operative pain between patients who received smaller grafts according to the accordion technique and patients who received conventional grafts.<sup>[7]</sup>

Free gingival graft is known to retain the original tissue characteristics of the donor site, and although this translates into predictably increasing keratinized tissue, it might result in an unfavorable esthetics due to the difference in color and surface texture of the grafted site when compared to adjacent sites.<sup>[8]</sup> Therefore, it is suggested to limit the use of free gingival grafts to areas where esthetics is not a concern such as the anterior mandibular areas in most patients.

## CASE DESCRIPTION

### CASE (1)

A 22 years-old male patient presented to the clinic complaining of tooth sensitivity and bleeding on brushing. Patient was a non-smoker and with no underlying medical conditions. Oral hygiene practice was satisfactory at the time of presentation. Clinical examination revealed a complete lack of keratinized tissue at teeth 31 and 41 with muscle pull from the labial frenum causing RT1 gingival recession.<sup>[9]</sup> The problem was compounded with the fact that the vestibular depth was shallow (Figure 1).

The aim of the treatment was to create an adequate band of attached, keratinized tissue at 31 and 41 and to remove the frenal pull and deepen the vestibule. Free gingival graft was selected as the treatment of choice because it will achieve all three goals in one surgery, in addition to the possibility of covering the roots through creeping attachment overtime.

**Surgical procedures:** 1.7 ml of lidocaine hydrochloride with adrenaline 1:100000 (Septodont) was given as an infiltration at 31 and 41 and the recipient site was prepared by sharp dissection of the flap using a 15C blade leaving the periosteum undisturbed on the bone to provide blood supply for the graft. The flap was sutured apically using 7-0 Vicryl (Ethicon) interrupted sutures to deepen the vestibule while

creating a stable periosteal bed for the graft. The palate was then anesthetized using 0.5 ml of lidocaine hydrochloride with adrenaline 1:100000 and a free gingival graft of the same size as the donor site was harvested by placing 4 incision 3 mm apical to the gingival margin using a 15C blade.

The graft was then dissected from the underlying connective tissue and transferred outside the mouth where it was kept moist in Saline solution (Figure 2). The donor site was packed with CollaTape (Zimmer, Biomet) and sutured with 4-0 Vicryl (Ethicon) to control the bleeding. The graft was then placed on the recipient bed and sutured using 7-0 Vicryl sutures (Ethicon) followed by pressure for 5 minutes with a wet gauze to ensure good adaptation of the graft to the underlying periosteum (Figure 3).

Patient was then placed on ibuprofen 600mg t.i.d. for 5 days and was given an acrylic palatal stent to protect the palatal wound during eating and drinking in the first few days following the procedure. The patient was instructed to refrain from performing any mechanical oral hygiene at the surgical site and to gently rinse with chlorhexidine gluconate 0.12% twice daily instead.

**Follow up:** Patient was seen at 1 week (Figure 4) and gentle saline irrigation was done to remove any debris; any loose sutures were removed at this appointment and oral hygiene was reinforced. Patient was seen on weekly basis for the first 4 weeks following the surgery.

At one month follow up the graft looked stable and the recession on 31 was almost healed (Figure 5). The patient also reported significant improvement in his symptoms and was instructed to resume brushing at lower incisors using a soft toothbrush. At four months follow up there was significant increase in keratinized tissue (5mm on 31 and 4mm on 41) with complete coverage of the recession on 31 and decrease in the depth of recession on 41. We were able to also successfully remove frenal pull and deepen the vestibule (Figure 6). The patient reported complete resolution of sensitivity and bleeding on brushing.

### CASE (2)

A 26 years-old healthy, non-smoker female patient presented to the clinic complaining of bleeding on brushing and gum recession. Patient oral hygiene was satisfactory at the time of presentation.



**Figure 1: RT1 recession with 31,41**



**Figure 2: Harvested FGG**



**Figure 3: FGG sutured at site**



**Figure 4: One week follow up**



**Figure 5: One month follow up**



**Figure 6: Four months follow up**

Clinical examination revealed RT-2 gingival recession Cairo [9] and a complete lack of keratinized gingiva on teeth 31 and 41 with buccal malposition of both teeth. High frenal attachment and calculus deposits were also detected (Figure 7). The aim of the treatment was to remove the frenum and create a wide zone of keratinized tissue around 31 and 41 to stop the progression of recession and regain gingival health. Partial coverage of the recession can be anticipated through creeping attachment.

**Surgical procedure:** 1.7 ml of lidocaine hydrochloride with adrenaline 1:100.000 (Septodont) was given as an infiltration at 31 and 41 and the recipient site was prepared by sharp dissection of the flap using a 15C blade leaving the periosteum undisturbed on the bone to provide blood supply for the graft. The palate was then anesthetized using 0.5 ml of lidocaine hydrochloride with adrenaline 1:100.00 and a free gingival graft of the same size as the donor site was harvested by placing 4 incision 3 mm apical to the gingival margin using a 15C blade. The graft was then dissected from the underlying connective tissue and transferred outside the mouth where it was kept moist in Saline solution.

The donor site was packed with CollaTape (Zimmer, Biomet) and sutured with 4-0 Vicryl (Ethicon) to control the bleeding. The graft was then placed on the recipient bed and sutured using 5-0 Polypropylene sutures (Ethicon) followed by pressure for 5 minutes with a wet gauze to ensure good

adaptation of the graft to the underlying periosteum (Figure 8).

Patient was then placed on ibuprofen 600 t.i.d. for 5 days and was given an acrylic palatal stent to protect the palatal wound during eating and drinking in the first few days following the procedure. The patient was instructed to refrain from performing any mechanical oral hygiene at the surgical site and to gently rinse with chlorhexidine gluconate 0.12% twice daily instead.

**Follow up:** Patient was seen at 1 week and gentle saline irrigation was done to remove any debris; any loose sutures were removed at this appointment and oral hygiene was reinforced. The patient was seen on weekly basis for the first 4 weeks and was instructed to resume brushing the area with a soft toothbrush at the 1 month follow up appointment. At six weeks follow up the graft looked stable and an increase in keratinized tissue thickness was clinically evident (Figure 9).

The patient also reported significant improvement in his symptoms. At six months follow up there was significant increase in keratinized tissue (3mm on 31 and 4mm on 41) with decrease in the depth of recessions over teeth 31 and 41 (Figure 10). The patient reported complete resolution of her symptoms and the gingiva looked healthy with absence of bleeding on probing.



**Figure 7: RT2 recession with 31,41**



**Figure 9: Six weeks follow up**



**Figure 8: FGG sutured in place**



**Figure 10: Six months follow up**

## DISCUSSION

In both patients there was a complete absence of keratinized tissue which renders any attempt at coronally advancing the tissues very risky. Moreover, in the first case when we consider the fact that the vestibule is shallow in addition to the pull from the frenum, it becomes clear that coronally advancing the tissues is not a suitable approach in this situation. This claim is supported by De Sanctis and Zucchelli<sup>[10]</sup> recommendation to having at least 1 mm of keratinized tissue apical to the recession defect as a minimum prerequisite for doing a coronally advanced flap. Therefore, free gingival graft was the simplest and most predictable treatment option for both cases.

This conclusion seems to be in line with the findings of Camargo *et al*<sup>[11]</sup> where they recommended using a free gingival graft in situations where there is a shallow vestibular depth and frenal pull over the use of a subepithelial connective tissue graft. The authors argued that although using a sub epithelial connective tissue graft and a coronally advanced flap in such situations would result in thickening of the mucosa and root coverage, the mucosa would still be movable, and the vestibule depth will remain shallow.

Another alternative to doing a free gingival graft in cases with a shallow vestibule could be the tunnel technique. Although tunnel preparation in presence of thin tissues pose

a technical challenge when compared to doing a free gingival graft, in a recent paper Allen<sup>[12]</sup> argued that treating gingival recession in the anterior mandible using tunnel technique will in fact expand the vestibule and remove any aberrant frenal attachments through performing sub-periosteal dissection for a distance of 7-8 mm from the CEJ, followed by sharp dissection for another 7-8 mm. The author compared the recipient bed in tunnel technique to that of a free gingival graft in that both provide a stable bed for the graft.

There is contradiction in the literature regarding the role of tooth malposition in gingival recession. On one hand, according to Patel *et al.*<sup>[13]</sup> mal-aligned teeth with their roots protruding from the alveolar ridge is considered an etiologic factor for recession especially when combined with a thin gingival phenotype.

On the other hand, although tooth malposition was one of the criteria for Miller's classification,<sup>[14]</sup> Cairo *et al.* (2011)<sup>[9]</sup> argued that the influence of tooth malposition on the development of gingival recession is unclear, and the authors removed this criterion from the new classification system that they developed.

Still, reducing root prominence is considered common sense when attempting root coverage. However, it is not always possible to reduce the root prominence to be within the alveolar process, as in cases with severe labial

inclination of the tooth, hence rendering complete root coverage difficult. Case 2 would serve as a good example of this dilemma, and perhaps aligning the teeth through orthodontic treatment could result in complete resolution of the recession in this case.

## CONCLUSION

Free gingival grafts still have its place in modern dentistry; it is considered a highly predictable technique for increasing keratinized tissue around teeth in the anterior mandible, especially in cases with extremely thin tissues, shallow vestibule, and aberrant frenal attachment.

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