



Free Gingival Graft for Augmentation of Keratinized Tissue at Lower Incisor - A Case Report

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Abstract

Plaque accumulation may cause gingival recession, especially at sites with a thin periodontal biotype and difficulty in tooth cleaning. This gingival defect may, in the long term, progress without treatment and lead to losing teeth. In this case a 21-year-old woman consulted for modification of her marginal gingiva at lower incisors. The protocol was designed to respond to the generalized and deep aggressive periodontitis disease detected and to reduce bleeding of the jaws. Adequate sanitation and motivation led to regression of periodontal disease and reduce gingival inflammation. Due to the progression of buccal gingival recession at the lower incisor, patient was prepared for periodontal plastic surgery. Miller's Class III recession associated with small gingival dimensions indicates the use of free gingival autograft to correct the defect, increase keratinized tissue and prevent tissue loss for subsequent orthodontic treatment. The use of free gingival graft, as a predictable therapy, increases width and thickness of the marginal keratinized tissue and may also improves the result of orthodontic treatment in the area with the gingival defect.

Keywords: Gingival; Keratinized; Augmentation

Background

The gingival recession is defined as displacement of the soft-tissue margin apical to the cemento-enamel junction [1]. Some of their etiologies are described in literature such as anatomical and pathological factors. Related anatomical factors include fenestration and dehiscence of the alveolar bone. Within pathological factors, Trauma can be caused by improper tooth brushing but also lack of oral hygiene may lead to gingival recession. Thus, the detection of bacterial plaque accumulation localized in the buccal surface of tooth may create gingival recession [2].

Three major parameters are associated with increased susceptibility to gingival recession: thin gingival tissue; muco-gingival conditions; and inflammatory periodontal diseases [3]. It's suggested that gingival recession occurs primarily as a consequence of periodontal diseases [4]. The presences of specific periodontal pathogens cause connective tissue attachment loss that may be manifested with gingival recession at all tooth surfaces [2].

According to different forms, multiple classifications were proposed to identify gingival recessions [2]. Miller in 1985 proposed four classes based on the level of the gingival margin with respect to the muco-gingival junction and the underlying alveolar bone level [5]. A more recent classification in three types was introduced by Cairo and al in 2011 based on the level of inter-proximal attachment loss [6,7].

The patient's perception of recessions is greater in younger individuals, when its concern the incisors especially with deeper values of those recessions. Which were significantly associated with patient request of treatment [8].

The necessity of treatment is proposed when patient presenting with the following criteria [9]: Progressive gingival recession [10]; persistent gingival inflammation despite appropriate therapeutic interventions (clinical attachment loss > 5 mm and/or gingival recession \geq 2 mm); association muco-gingival conditions compromising oral hygiene (shallow vestibular depth, frenum position....) [3]. Another possible indication is the treatment of root hypersensitivity. From a clinical point of view, it seems that surgical root coverage procedures in treated gingival recession may treat root hypersensitivity with more than 50% of success rate [10,11].

Otherwise clinicians can monitor gingival recession [3].

Surgical modalities for treating a gingival recession include root coverage or keratinized tissue augmentation [10]. A root coverage procedure aims to augment soft tissues coronal to the gingival margin in order to manage root abrasion/caries and the inconsistency/disharmony of the gingival margin [2].

A keratinized tissue augmentation procedure aims to provide qualitative changes to the soft tissues apical to the gingival margin especially in the absence of keratinized tissue [10].

Case Presentation

A 21-years-old woman, nonsmoker, that consulted for a modification of her marginal gingiva in all incisors (Figure 1). According to the questioning, the patient did not show any general problem and no drug intake was reported.



Figure 1: Anterior clinical view showing the extrusion of the teeth 11, 41. Aggressive periodontitis with gingiva margin modification.

The protocol was designed to reduce jaws inflammation and to respond to the generalized and deep aggressive periodontitis disease detected (Figure 2).

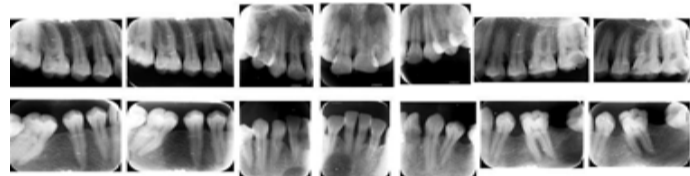


Figure 2: Full mouth radiographs demonstrating generalized severe vertical bone loss and tooth extraction.

The initial periodontal therapy was done. The non-surgical treatment started with scaling and root planning and completed with systemic anti-infective therapy. Following the recommendations of Van Winkelhoff, the adjunctive use of amoxicillin 500 mg plus metronidazole 250 mg three-times a day for 7 days were administered [12]. Adequate sanitation and oral hygiene aimed to regression of bleeding on probing and to stabilize periodontal disease at recall (Figure 3).



Figure 3: Stabilization of Periodontal Disease and Increase Buccal Recession.

Due to the progression of buccal recession on tooth 41, associated with frenal pull, the root hypersensitivity was related. The patient couldn't make her orthodontic treatment immediately without a periodontal correction (Figure 4). The goal of muco-gingival surgery, as curative periodontal therapy, was to increase the keratinized gingiva and stabilize the recession for a more secure orthodontic treatment. The free autologous gingival grafting was decided to manage the Miller's Class III recession associated with lack of keratinized tissue.



Figure 4: Periodontal probing. Lack of keratinized tissue in tooth 41 associated with frenal pull.

Case Management

The surgery started with peri buccal and intra buccal mouth rinse with antiseptic solution. The measuring indicates the exact dimension of periodontal defect using periodontal probing. Care should be taking in front of proximal medial frenum pull which interferes in the surgical site.

First Surgical Phase: Creation of the recipient bed (Figure 5).



Figure 5: Creation of the recipient bed.

The preparation of this flap is initiated by a vertical incision parallel of the recession and separate in a distance that exceed the width of the recipient bed and the exposed root surface by approximately 3 mm. This wide recipient connective tissue bed should be prepared apical and lateral to the recession defect, extending to 3 - 4 mm of others tooth will provide enough blood supplying. The difficulties were in cutting buccal thin gingiva around the lower incisors. Connective tissue of labial frenum and muscle fibers are carefully dissected away from the periosteum.

No root prominence or caries lesion was diagnosed. The root surface preparation was done only by mechanical root planning using Gracey curettes was sufficient to eliminate oral biofilm.

Second Surgical Phase: Harvesting a custom Free Gingival Graft from the palate (Figure 6).



Figure 6: Free Gingival Graft from the palate.

Respecting the new situation of demarcated recipient site, a free autogenous soft tissue graft was selected in the left region of the premolars and molars. A graft with a thickness of 2 - 3 mm is then dissected within respecting anatomical structures of the palatal mucosa in this area. The required size of the graft must be outlined by shallow incisions, in order to avoid injury to the palatine artery.

The palate plastic guard was placed to protect donor area against irritations.

Third Surgical Phase: Placing Free Gingival Graft in recipient bed (Figure 7).



Figure 7: Placing Free Gingival Graft in recipient bed.

The graft is adapted with smooth and thin angle in the four corner using scissors. Immediately, the connective tissue of graft is placed on the prepared recipient bed in the cervical border approximates the incision line. This situation leads to cover the root surface approximately. In order to immobilize the transplant, some atraumatic sutures must be anchored in the periosteum and others with attached gingiva.

Patient’s controls

Control at three days after surgery (Figure 8).



Figure 8: Control at three days after surgery.

The superficial cells of the graft turn to light color become necrotic and are slowly exfoliated. The wound surface not treated shows fibrin extension. In donor area too, no complication was related, and no pain was reported.

Control at fourteen days after surgery (Figure 9).



Figure 9: Control at fourteen days after surgery.

The healing step was great, the site was very carefully cleaned, and sutures were removed.

Control at six weeks after surgery (Figure 10).



Figure 10: Control at six weeks after surgery.

The wound healing was complete, the attached gingival increased in dimensions and no frenum tension was interfering.

Control at six months after surgery (Figure 11).



Figure 11: Control at six months after surgery.

The plastic surgery presents a satisfaction on clinical outcomes which provides keratinized tissue augmentation, more esthetic appearance, less sensibility of root and easier oral hygiene. The patient is now ready to begin her orthodontic treatment (Figure 12).



Figure 12: Patient's smile with orthodontic treatment.

Case Outcome

Miller's Class III recession associated with lack of gingival tissue in the lower incisor indicates the use of free gingival autograft to correct the defect and prevent tissue loss for subsequent orthodontic treatment.

Discussion

In the lower anterior area, recessions are frequently associated with poor mucogingival conditions due to lack of gingiva, presence of frenal attachments, and shallow fornix [13]. Clinicians prefer to apply a passive graft that entails minimal mobilization of the mucogingival junction and is not influenced by muscular or mucosal tractions [14]. The free gingival grafts can also still be used for augmentation of the keratinized tissue as well as when the thickness of gingiva and the vestibulum depth are requested [2]. This procedure is not the gold standard for root coverage however, in another periodontal considerations, the occurrence of creeping attachment describes as coronal progression of the epithelial. The gingival tissue becomes firmly attached to the root surface and the probing does not show any sulcular depth [15]. It seems to cover partially or totally a denuded root treated by a gingival graft after gingival healing

[16]. Although this appears to occur whenever there has been an attempt to achieve root coverage with graft surgery and continue to progress beyond the first postoperative year, the amount of creeping attachment is unpredictable [17].

Historically, periodontists have indicated gingival augmentation to recreate the zone of attached gingiva. The early concept for this approach was that attached gingiva is important to dissipate the force of muscle pull and unattached mucosa [18]. In some it has been observed that orthodontic tooth movement results in increased recession and increased incidence of dehiscence and fenestration formation in cases with thin biotype [19].

In orthodontic treatment, there is a higher probability of recession during tooth movement in areas with < 2 mm of gingiva [20], or in the movement of the incisors out of the osseous envelope [21]. This could be predisposing and identifiable risk factors [22], for the development of labial gingival recessions in both orthodontic and/or retention phase [23].

Within the clinical experience that soft tissue augmentation of bucco-lingual gingival dimensions before orthodontic treatment may be a clinically viable treatment option in patients considered at risk [18].

Conclusion

The free gingival graft at the incisor 41 has led to an increase in the height and width of keratinized tissue. This periodontal management at the lower zone allowed easier hygiene and a less progression of the recession. Thus, orthodontic treatment under optimal conditions in this patient will guarantee successfully long-term results.

Disclosure

None.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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