

An Alternative Approach of Mucogingival Problems Using Free Gingival Graft: A Case Series and Follow-up

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ABSTRACT

Aim: Mucogingival problems encompass a variety of clinical conditions, including inadequate keratinized tissue, gingival recession, shallow vestibular depth, and aberrant frenal attachments. The free gingival graft (FGG) is one of the periodontal plastic surgical procedures commonly used to increase the width of keratinized tissue.

The aim of this case series was to present the clinical characteristics of three patients with different mucogingival problems and to evaluate the clinical outcomes of free gingival graft procedures performed for their management.

Case Reports: Three cases presenting with mucogingival deformities, including aberrant frenal attachment, inadequate keratinized gingiva, shallow vestibular depth, a thin periodontal phenotype, and gingival recession, were reported. Periodontal treatment included oral hygiene instruction, mechanical periodontal debridement, and surgical intervention. FGG was selected to manage these deformities in a single surgical procedure.

Results: These cases demonstrated favorable clinical outcomes following FGG procedures performed in addition to oral hygiene instruction, periodontal debridement, and patient education for the management of the aforementioned mucogingival deformities.

Conclusion: FGG may represent a viable treatment option for the management of mucogingival deformities, including inadequate gingival width and thickness, shallow vestibular depth, and gingival recession. The procedure is technique-sensitive, and meticulous attention to surgical details is essential to achieve predictable and satisfactory clinical outcomes.

Keywords

Gingival recession, Inadequate vestibular depth, Aberrant frenulum, Gingival phenotype, Vestibuloplasty, Free gingival graft, Gingival augmentation.

Introduction

Mucogingival deformities encompass a range of clinical conditions affecting the periodontal soft tissues, including gingival recession, a thin gingival phenotype, inadequate keratinized tissue, shallow vestibular depth, and anatomical problems associated with aberrant or high frenal attachments [1-7]. The free gingival graft has long been used as a periodontal plastic surgical procedure to achieve

root coverage and to increase the width of keratinized tissue and soft tissue thickness. Systematic reviews have reported that FGG remains a well-established and predictable reference technique when augmentation of keratinized tissue around teeth is indicated [1-5].

Since its initial description by Björn in 1963 [8] and its subsequent application as a free gingival graft by Nabers in 1966 [9], this procedure has been used to increase the amount of keratinized tissue and to achieve root coverage. FGG has demonstrated a high degree of predictability in the management of various mucogingival defects, including gingival recession, aberrant frenal

attachment, and shallow vestibular depth [1,2,10-13]. Its most common indication is considered to be the augmentation of the width and thickness of keratinized tissue [1-5].

Following FGG, creeping attachment, defined as the gradual coronal migration of the gingival margin over time, represents a secondary healing phenomenon that may contribute to additional root coverage [10].

The aim of this case series was to present the clinical characteristics of three patients with different mucogingival problems and to evaluate the clinical outcomes of the free gingival graft procedures performed for their management.

This case series was prepared and reported in accordance with the CaReL guidelines [14].

Case Reports

Case 1

A 28-year-old female patient was referred to our clinic with complaints of gingival recession and dentinal hypersensitivity. Intraoral examination revealed mucogingival problems involving tooth #31, which was positioned outside the dental arch, including inadequate keratinized gingiva, 3mm of gingival recession, and an aberrant frenal attachment. The patient was systemically healthy and was not taking any medications. It was also noted that orthodontic treatment was planned due to her orthodontic treatment needs. Periodontal therapy consisted of oral hygiene instruction, mechanical periodontal debridement, and surgical treatment. A free gingival graft was selected to manage all three mucogingival problems within a single surgical procedure. At the 3-month follow-up, an increase in keratinized tissue width and

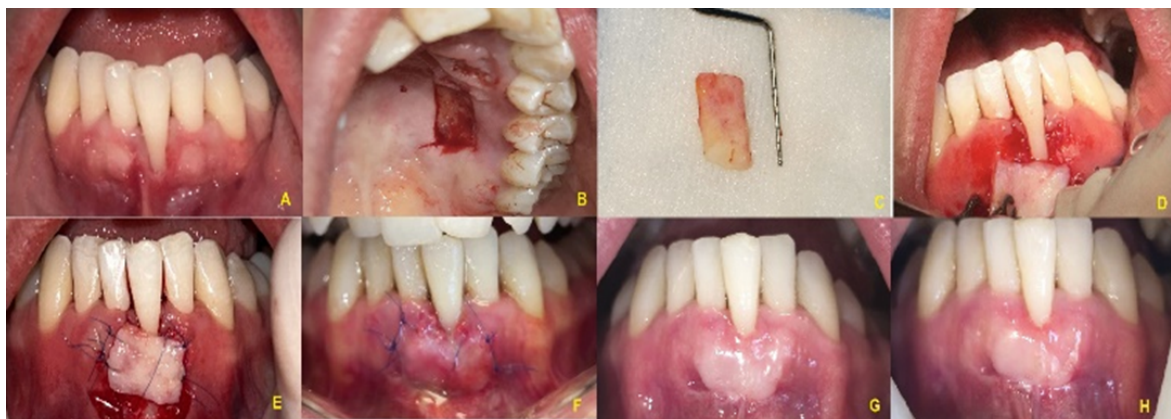
soft tissue thickness, together with complete root coverage, was observed (Figure 1A-H).

Case 2

A 40-year-old female patient presented to our clinic with gingival recession. Intraoral examination revealed 5mm of gingival recession at mandibular teeth #31 and #41, accompanied by Miller Class I tooth mobility. The width of keratinized gingiva in the affected region was ≤ 2 mm. The patient was systemically healthy, was not taking any medications, and reported no known allergies. The periodontal treatment plan included oral hygiene instruction, mechanical periodontal debridement, and surgical intervention. A free gingival graft was selected as the surgical treatment. At the 6-month follow-up, 3mm of root coverage was achieved, together with an increase in keratinized tissue width and soft tissue thickness, and complete resolution of tooth mobility (Figure 2A-H).

Case 3

A 34-year-old female patient presented to our clinic with complaints of gingival recession and dentinal hypersensitivity. Periodontal examination revealed gingival recession and shallow vestibular depth involving teeth #41, #31, and #32. The patient was systemically healthy and was not taking any medications. The periodontal treatment plan included oral hygiene instruction, mechanical periodontal debridement, and surgical intervention. A free gingival graft was selected as the surgical treatment. At the 3-month follow-up, root coverage was observed, together with an increase in vestibular depth and the amount of keratinized gingiva (Figure 3A-G).



A) Preoperative clinical view.

B) Clinical view of the palatal donor site following graft harvesting.

C) Free gingival graft harvested from the palatal donor site.

D) Recipient bed prepared for free gingival graft placement.

E) Immediate postoperative clinical view following adaptation and stabilization of the graft with sutures.

F) Clinical view at postoperative day 12.

G) Clinical view at the 1-month postoperative follow-up.

H) Clinical view at the 3- and 6-month postoperative follow-up.



Surgical Procedure

Following local anesthesia, the recipient bed was prepared using a 15C scalpel blade. A free gingival graft harvested from the palatal donor site was adapted to the prepared recipient bed. Graft stabilization was achieved using 5-0 polypropylene surgical sutures.

During the postoperative period, patients were prescribed an analgesic–anti-inflammatory agent and chlorhexidine oral spray. Postoperative instructions were provided both verbally and in writing.

The case presentations were performed in accordance with the principles outlined in the Declaration of Helsinki. Written informed consent was obtained from all patients for the publication of their clinical findings and accompanying images.

Discussion

Soft tissue grafting procedures are increasingly used to achieve adequate width and thickness of keratinized tissue, provide coverage of exposed root surfaces, and manage various mucogingival deformities. The free gingival graft (FGG) is considered an established periodontal surgical technique for increasing the dimensions of keratinized tissue and thereby contributing to gingival health and long-term tissue stability [1-5]. As demonstrated in the present case series, FGG represents a well-

established clinical approach for the management of mucogingival deformities, including inadequate keratinized tissue width and thickness, shallow vestibular depth, and gingival recession. Gingival recession may be associated with various factors, including periodontal disease, mechanical trauma, unfavorable occlusal relationships, a thin periodontal phenotype, and tooth position [2,3]. The 2017 World Workshop emphasized that gingival recession should be considered within a broader clinical context that includes inadequate width and thickness of keratinized tissue and other anatomical deformities [1,2]. In particular, inadequate keratinized tissue width and thickness are of clinical importance, as current evidence suggests that thin and narrow gingival tissues are associated with a higher prevalence and greater severity of gingival recession [2-4]. In the present cases, a thin and narrow gingival phenotype was observed in combination with additional mucogingival problems, including high frenal attachment and shallow vestibular depth.

The primary objectives of mucogingival surgery include achieving predictable root coverage and establishing an adequate amount of keratinized gingival tissue to support long-term periodontal stability [1,3]. In recent years, soft tissue grafting techniques have been increasingly utilized to enhance soft tissue volume, widen the zone of keratinized tissue, and provide coverage of exposed root surfaces [1-5]. Free gingival grafting (FGG) has also been widely employed in periodontal surgery and has contributed substantially

to the improvement of periodontal health. Currently, autogenous gingival grafting is regarded as the clinical gold standard for increasing and maintaining an adequate width of keratinized tissue.

FGG has demonstrated favorable clinical outcomes in the management of various mucogingival defects, including gingival recession, aberrant frenal attachment, and shallow vestibular depth. Its most common indication is considered to be augmentation of keratinized tissue [3-5]. The versatility of this technique is also reflected in its use for root coverage procedures [12,13]. In the present case series, FGG provided an effective approach for achieving an adequate amount of keratinized tissue.

The treatment of gingival recession primarily aims to obtain coverage of exposed root surfaces, enhance esthetic outcomes, and alleviate dentinal hypersensitivity. A range of soft tissue grafting procedures has been described for the management of gingival recession. To achieve predictable root coverage, several techniques have been utilized, including subepithelial connective tissue grafts, laterally positioned flaps, coronally advanced flaps, double papilla flaps, and guided tissue regeneration [1-5]. In the present case series, FGG represented a suitable treatment option not only for increasing the width and thickness of keratinized tissue but also for achieving root coverage and adequate vestibular depth.

The literature on free gingival grafts has reported highly variable root coverage outcomes, ranging from 11% to 100% [3]. This variability may be attributed to differences in the severity of gingival recession and in surgical techniques, including factors such as the use of root surface conditioning agents and graft thickness [3-5]. As demonstrated in the present case series, FGG achieved successful root coverage ranging from 70% to 100% in Class I and II gingival recessions. The extent of root coverage may also be influenced by defect morphology and appropriate case selection [3].

Dimensional changes may occur during the healing process following FGG. The extent of creeping attachment after FGG has been reported to be influenced by several factors, including the width of the recession defect, graft position, underlying bone support, tooth position, and oral hygiene [10]. In Matter's 5-year follow-up study, a substantial proportion of root coverage in narrow gingival recession defects was attributed to creeping attachment; however, this outcome was neither complete nor predictable in all cases [10]. In addition, a reduction in keratinized tissue width and graft shrinkage may occur during the first 12 months following FGG around teeth [3,4].

With the increasing popularity of root coverage procedures, esthetic considerations have become increasingly important in periodontal therapy. However, the esthetic outcomes of FGG procedures performed primarily to increase the amount of keratinized tissue are often considered suboptimal [4,5]. Esthetic limitations of FGG may include color and texture mismatch as well as a bulky tissue

contour; therefore, several modified grafting techniques have been developed to minimize these disadvantages [3-5]. Accordingly, graft thickness should be regarded as an important clinical parameter and carefully controlled. Although a graft thickness of approximately 0.9 mm placed on a periosteal recipient bed may be functionally adequate, thicknesses ranging from 1.0 to 1.5 mm have been reported to provide optimal dimensions for grafted tissue. In contrast, very thin grafts, approximately 0.5–0.6 mm in thickness, may provide better color blending with the adjacent tissues [2-5]. In the present case series, the final outcomes in terms of both color match and tissue contour were considered acceptable by the patients.

Conclusion

FGG may represent a viable treatment option for the management of mucogingival deformities, including inadequate gingival width and thickness, shallow vestibular depth, and gingival recession. The procedure is technique-sensitive, and meticulous attention to surgical details is essential to achieve predictable and satisfactory clinical outcomes. Surgical periodontal treatment may also contribute to improved esthetics, reduction of dentinal hypersensitivity, and a decreased risk of root caries.

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