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# FREE GINGIVAL GRAFT FOR MANAGEMENT OF MILLER'S CLASS II GINGIVAL RECESSION IN AN ORTHODONTIC PATIENT: A CASE REPORT

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## ABSTRACT

Gingival recession is a common mucogingival defect characterized by apical migration of the gingival margin resulting in root exposure, dentinal hypersensitivity, compromised esthetics, and increased susceptibility to root caries. Orthodontic tooth movement in patients with thin gingival phenotype and inadequate keratinized tissue may predispose to recession defects. Augmentation of the attached gingiva is essential to provide periodontal stability and prevent further soft tissue breakdown. Free gingival graft (FGG) is a predictable and time-tested technique for increasing the width and thickness of keratinized gingiva. This case report describes the management of Miller's Class II gingival recession in a 20-year-old female undergoing orthodontic treatment who was referred from the Department of Orthodontics. The defect was treated using an autogenous free gingival graft harvested from the palate. Postoperative evaluation demonstrated significant gain in keratinized tissue width, improved gingival thickness, reduction in hypersensitivity, and satisfactory root coverage with stable results. The case highlights the importance of interdisciplinary management and supports FGG as a reliable modality for mucogingival augmentation in orthodontic patients.

## INTRODUCTION

Gingival recession is defined as the displacement of the gingival margin apical to the cemento-enamel junction (CEJ), leading to exposure of the root surface.[1] It is frequently associated with dentinal hypersensitivity, plaque retention, root caries, and aesthetic concerns. The etiology of gingival recession is multifactorial and includes inflammatory periodontal disease, traumatic tooth brushing, high frenal pull, thin periodontal phenotype, and iatrogenic factors such as orthodontic therapy.[2]

Orthodontic tooth movement, particularly labial movement beyond the alveolar envelope, may predispose to alveolar dehiscence and soft tissue recession, especially in patients with inadequate keratinized gingiva.[3] Such mucogingival defects necessitate periodontal intervention to enhance tissue stability and maintain periodontal health during and after orthodontic treatment.

Miller's classification is commonly used to categorize gingival recession defects and determine prognosis for root coverage.[4] Miller's Class II defects extend beyond the mucogingival junction without interdental tissue loss, offering a favourable prognosis for coverage procedures.

Various mucogingival surgical techniques have been proposed for the management of recession, including coronally advanced flap, laterally positioned flap, connective tissue graft, tunnel techniques, and free gingival graft. Among these, the free gingival graft, first described by Björn and later popularized by Sullivan and Atkins, remains the gold standard for increasing the zone of attached gingiva.[5,6] This case report describes the successful management of a Miller's Class II recession using FGG in an orthodontic patient.

## CASE REPORT

A 20-year-old female patient was referred from the Department of Orthodontics to the Department of Periodontics with the chief complaint of "receding gums

and sensitivity in the lower front tooth." The patient was undergoing fixed orthodontic treatment for correction of malalignment. She was systemically healthy with no significant medical or drug history.

**Clinical Examination**

Intraoral examination revealed localized gingival recession on the labial aspect of mandibular right central incisor (41). The marginal tissue was positioned apical to the CEJ, extending beyond the mucogingival junction. The interdental papillae were intact with no clinical attachment loss interproximally. The recession height measured 5 mm and width of 2 mm with inadequate keratinized gingiva. The gingival phenotype was thin, and vestibular depth was shallow. The patient reported dentinal hypersensitivity during brushing.

Based on Miller's criteria, the defect was classified as Miller's Class II gingival recession.

**Pre operative Miller's class II recession (41).**

**Pre operative donor site**

**Pre operative measurements height**

**Pre operative measurements width**

**Initial Therapy**

**Phase I periodontal therapy included**

- Scaling and root planing
- Reinforcement of oral hygiene measures

After four weeks, inflammation subsided and surgical intervention was planned.

**Surgical Procedure**

Local anaesthesia was administered using 2% lignocaine with adrenaline (1:80,000).

**Recipient site preparation**

A horizontal incision was placed at the level of CEJ with two vertical releasing incisions extending apically. A partial-thickness flap was elevated to create a well-vascularized connective tissue bed. The exposed root surface was thoroughly planed.

**Donor site preparation**

A template was used to determine graft dimensions. A free gingival graft approximately 1.5–2 mm thick was harvested from the palatal premolar- molar region. Haemostasis was achieved using pressure pack and acrylic plate.

**Graft placement**

The harvested graft was adapted to the recipient bed and stabilized using interrupted sutures along the margins and circumferential sling sutures around the tooth to ensure intimate adaptation and immobilization of the graft. A periodontal dressing was placed.

Recipient bed preparation

Donor site

Free gingival graft

Suturing

**Postoperative Care**

The patient was prescribed analgesics and antibiotics. Chlorhexidine mouth rinse was advised twice daily. Mechanical plaque control at the surgical site was avoided for two weeks.

Sutures were removed after 10 days.

**Follow-up**

**Healing was uneventful. At 3 months follow-up:**

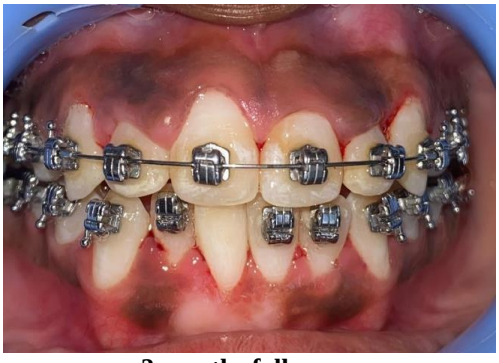
- Gain of keratinized tissue
- Increased gingival thickness
- Reduced hypersensitivity
- Root coverage
- Stable and healthy gingival margin

Seven days follow up

Three months follow up

At the end of three months, satisfactory clinical results were obtained with significant gain in keratinized tissue, improved gingival thickness, and stable root coverage. Orthodontic treatment was recommenced after a healing period of three months to allow complete graft maturation, revascularization, and establishment of periodontal stability.

Pre-operative



3 months follow up

## DISCUSSION

Gingival recession is a common mucogingival deformity that may arise from inflammatory, anatomical, traumatic, or iatrogenic causes and is frequently observed in young adults undergoing orthodontic therapy. Orthodontic tooth movement beyond the alveolar housing, particularly in individuals with a thin periodontal phenotype and minimal keratinized gingiva, has been strongly associated with the development of soft tissue dehiscence and marginal tissue recession.[1,3] In the present case, the patient was referred from the Department of Orthodontics for periodontal evaluation after noticing progressive gingival shrinkage and hypersensitivity during fixed appliance therapy. This interdisciplinary referral highlights the importance of early periodontal assessment in orthodontic patients to prevent further attachment loss and ensure long-term treatment stability.

Adequate attached gingiva is essential for maintaining periodontal health, as it facilitates effective plaque control, reduces muscle pull, and improves resistance to mechanical trauma and inflammation.[3] When keratinized tissue is deficient, patients may experience discomfort during brushing and increased susceptibility to recession progression. Therefore, augmentation of the keratinized tissue becomes the primary therapeutic goal in addition to root coverage. Free gingival grafting, first described by Björn and later popularized by Sullivan and Atkins, is considered a predictable procedure for increasing the width of attached gingiva.[5,6]

Orthodontic wires are removed prior to mucogingival or root coverage surgery to ensure tissue stability, optimal healing, and surgical access. The presence of an active orthodontic appliance may transmit continuous forces to the teeth, resulting in micromovement of the flap or graft, which can disrupt blood clot formation and compromise revascularization of the surgical site. Such movement may lead to graft displacement, delayed healing, or failure of root coverage. In addition, orthodontic wires hinder proper flap reflection, instrumentation, and precise suturing, and they increase plaque accumulation and inflammation around the surgical area, negatively affecting wound healing. Therefore, periodontal plastic surgery is ideally performed only after orthodontic forces are discontinued and teeth are stabilized to allow predictable outcomes.

FGG was selected in this case due to the shallow vestibule, thin phenotype, and minimal keratinized tissue, conditions under which coronally advanced flap procedures alone may show relapse. The technique offers advantages such as simplicity, minimal technique sensitivity, and consistent gain in keratinized gingiva.[7] Healing of the graft occurs initially through plasmatic diffusion followed by inosculation and revascularization, ultimately resulting in complete integration with the recipient bed.[8] This process leads to increased tissue thickness and improved resilience of the marginal periodontium. Furthermore, creeping attachment may result in additional coronal migration of the gingival margin over time.[9]

Creeping attachment refers to the postoperative coronal migration of the gingival margin over a previously exposed root surface following mucogingival or root coverage procedures, resulting in additional root coverage beyond that achieved at the time of surgery.[10] The phenomenon was first described by Goldman and Cohen and later termed and clinically documented by Matter, who reported a gradual coronal displacement of approximately 0.5–1.0 mm occurring over several months to one year after healing.[10]

Creeping attachment is most commonly observed after free gingival grafts, although it may also occur following connective tissue grafts and coronally advanced flap procedures.[11] The biologic basis involves tissue maturation, creeping of the junctional epithelium, connective tissue remodeling, increased keratinization, and functional adaptation of the grafted tissue under conditions of minimal inflammation and adequate plaque control. It is more predictable in narrow recession defects, thick gingival phenotype, and well-vascularized recipient sites, whereas it is limited in wide and deep recession defects.[11] Clinically, creeping attachment improves the final esthetic outcome and contributes to enhanced root coverage over time, representing an additional long-term benefit of periodontal plastic surgery rather than an immediate surgical result.

Free gingival grafts (FGG) are effective in increasing the width of attached gingiva and deepening the vestibule, thereby improving mucogingival stability.[1] However, the procedure requires a second surgical donor site, which increases patient morbidity, postoperative pain, and discomfort.[10] In addition, FGG frequently demonstrates poor color match and contour discrepancies with adjacent tissues, often producing an unaesthetic patch-like appearance.[12] Considerable graft shrinkage during healing has been reported, which may compromise the final clinical outcome.[11] Root coverage with FGG is less predictable compared with connective tissue grafts or coronally advanced flap procedures.[11] Furthermore, inadequate vascularity at the recipient site may jeopardize graft survival and delay healing.

Therefore, FGG is primarily indicated for augmentation of keratinized tissue.

Although connective tissue grafts may provide superior aesthetics and higher percentages of root coverage, they are more suitable when adequate keratinized tissue is already present.[13] In contrast, FGG remains the gold standard when the primary objective is mucogingival augmentation and long-term stability. The favourable clinical outcomes observed in the present case, including significant gain in keratinized tissue, reduced hypersensitivity, and stable results, reaffirm the reliability and predictability of this technique, particularly in

orthodontic patients.

## CONCLUSION

Free gingival grafting is a reliable and effective technique for the management of gingival recession associated with inadequate keratinized gingiva. In orthodontic patients, augmentation of tissue thickness and width provides periodontal stability and prevents further recession. The present case demonstrated successful outcomes with increased attached gingiva, improved tissue health, and high patient satisfaction. Early interdisciplinary collaboration between orthodontics and periodontics plays a crucial role in achieving optimal and stable results.

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