

## FREE GINGIVAL GRAFT TECHNIQUES: A PERMANENT CURE TO UNAESTHETIC RECEDING GUMS?

Nikita Sankhe<sup>1</sup>

1. DY Patil dental college

### ABSTRACT:

Gingival recession may present problems that involve root sensitivity, esthetic problems, and predilection to root caries, cervical abrasion and compromising of a restorative effort<sup>1</sup>. When the health of the marginal tissue cannot be maintained and recession is deep, the need for treatment arises. Improper brushing forces lead to unaesthetic recession areas of the gum tissue leading to root exposure and cervical abrasion facets<sup>2</sup>. Once the facets have been restored by a restorative cement, the recession can be treated by a free gingival graft or connective tissue graft technique<sup>3</sup>. This literature has documented that recession can be successfully treated by means of a surgical approach, consisting of creation of attached gingiva by means of free gingival graft. This technique makes sure that there is development of an adequate width of attached gingiva. The outcome of this technique suggests that free gingival graft procedures are highly predictable for root coverage in case of isolated deep recession and lack of attached gingiva.

Keywords: Gingival recession, Attached gingiva, Palatal Graft tissue, Recipient bed

### INTRODUCTION

In the recent times, clinicians have a challenge of not only addressing biological and functional problems present in the periodontium, but also providing therapy that result in acceptable esthetics. The presence of mucogingival problems and gingival recession around anterior, highly visible teeth creates a situation in which a treatment that addresses both biological and esthetic demands is required. Over the years, numerous surgical techniques have been introduced to correct labial gingival recession defect<sup>[1-4]</sup>. Esthetic concerns are usually the reason to perform these procedures. Clinical studies have evaluated many of the techniques.

The depths of the defects were measured before surgery and at a follow-up examination at 6 months or later. Results in terms of mid surface root coverage have been expressed in millimeters and as the percentage of original defect that has been covered.<sup>[1]</sup> Defects with complete coverage have also been reported<sup>5</sup>. Gingival recession associated with root surface exposure is a complex phenomenon that may present numerous challenges to the clinician. Recession may cause root caries or abraded surfaces, and patients may complain of esthetic defects or root hypersensitivity.<sup>[1]</sup> During the past decade, a variety of regenerative procedures were conducted to correct gingival recession defects via

augmentation of the width and height of keratinized or attached gingiva as well as to obtain complete or partial root coverage have been proposed. Presence of gingival recession and gingival inflammation in areas with absence of, or narrow band of attached gingiva is identified as a mucogingival problem<sup>[5-6]</sup>. The choice of the technique depends on the defect size, localization in esthetic zone, and the need for augmentation of attached gingiva. Free soft tissue graft is preferred for root coverage of isolated deep and narrow recessions with inadequate width of attached gingiva.

The normal width of the keratinized and attached gingiva at the gingival zenith ranges upto (4.5 – 1.1) mm in the anterior submandibular region and (5.8-1.0) mm to (7.6-0.9)mm in the interdental papilla of the mandible. The narrowest width of the keratinized gingiva at the interdental papilla was located over central incisors.<sup>[7]</sup>

Gingival recession leads to a reduction in the width of the attached gingiva. In case of inadequate width of attached gingiva in the mandibular region a free gingival graft procedure is indicated, since it acts by restoring the level of the attached gingival tissue back to its original position. It not only helps in coverage of the exposed root but also restored the gingiva to its original level.<sup>[1]</sup>

**Aim:** To prove the efficacy of a free gingival autograph harvested from the maxillary palatal posterior region in the treatment of gingival recession in mandibular anterior regions resenting with Miller's Class II gingival recession.

**Methods and materials:** Three patients reported to DY Patil dental college with a chief complaint of sensitivity of teeth, unaesthetic receding gums. Some complained of low confidence due to the unaesthetic appearance of the receding gums.

Complete oral examination was carried out and case histories were taken. A record of the patient's medical health, drug history and habits was noted down and possibilities of any medical conditions or allergic reactions were ruled out.

The three patients had an inadequate width of the attached gingiva and presented with Miller's class II OR III recession a free gingival graft procedure was indicated for treatment.

#### **Miller's gingival recession<sup>[8]</sup>**

Class I : Marginal tissue recession which does not extend to the mucogingival junction (MGJ).

There is absence of alveolar bone loss or soft tissue loss in the inter-dental area

Complete root coverage obtainable

Class II : Marginal tissue recession which extends to or beyond the MGJ

There is absence of alveolar bone loss or soft tissue loss in the interdental area

Complete root coverage obtainable

Class III : Marginal tissue recession which extends to or beyond the MGJ.

Bone or soft tissue loss in the interdental area is present

Partial root coverage related to level of papilla height

Class IV : Marginal tissue recession which extends to or beyond the MGJ.

The bone or soft tissue loss in the interdental area is present with gross flattening

No root coverage

**Preparing the recipient bed:** A mucosal split thickness flap is elevated and reflected past the mucogingival junction. A periosteal bed is left on the recipient site to allow easy suturing. Muscle insertions and frenal attachments are released to relieve the tissues of tension.



**Harvesting the palatal graft tissue:** It contains epithelium and a layer of connective tissue. The graft is harvested from the posterior palatal region (molar to canine region). A band of 2 – 3 mm tissue is left around the gingival margin of teeth, to avoid recession. Extending the graft posterior to the 1<sup>st</sup> molar is avoided to prevent injury to the greater palatine artery which is located within this region. The average distance between the CEJ of the 1<sup>st</sup> molar to greater palatine artery is 13mm (Fu et al 2011) (this may vary from person to person due to variable palatal anatomy)

Graft is harvested 15 – 25% larger than the desired final size, this is to overcome primary (immediate) and secondary (during healing) contraction. It can be expected to shrink an average of 20% during healing. It is normally rectangular in shape. The sub epithelial tissue is mostly composed of a thin connective tissue layer, adipose and glandular tissue. Adipose and glandular tissue were removed from the surface before placement. This is done with the help of a 15 number blade.



Other graft sites are: Edentulous areas, buccal areas or the maxillary tuberosity

Quality and thickness of the graft tissue related to the survival of the graft: thickness of the graft is 0.75- 1.5mm. **If the graft is too thin** most of the graft will be epithelium and there won't be enough connective tissue resulting in tearing. It's of utmost importance to keep enough thickness of connective tissue to lamina dura attachment since it's a primary source of blood supply to the graft.

**If the graft is too thick** there will be a difficulty in establishing a good blood supply leading to prolonged healing time;

also subsequent necrosis and failure of the graft.

Therefore a graft tissue of a thickness of 0.75 to 1.5mm was harvested from the region between 1<sup>st</sup> molar and 1<sup>st</sup> premolar region while maintaining a distance a 2 mm from the marginal gingiva.

## CASE DETAIL

A 27-year-old female patient reported to the department of periodontics with a chief complaint of tooth sensitivity and exposure of root surface in relation to her lower front tooth.

On examination, her Oral hygiene status in the lower right central incisor area was fair,

Gingiva was red in color with presence of Bleeding on probing, Probing pocket depth was absent. Clinical attachment loss was recorded as the distance from the CEJ (Cemento enamel junction and the base of the pocket). Miller's class II gingival recession was seen in relation to 41 and attached gingiva was inadequate in relation to this tooth. Mobility was absent. Attachment loss was 6 mm in relation to 41. Probing depth was 2 mm. Many mucogingival problems such as recession, loss of attached gingiva, and traumatic injuries are a result of vigorous brushing. In this female patient of 27 years, the reason was a faulty toothbrushing technique.

Mechanical plaque control was avoided in surgical site for 10 days following surgery. Brushing technique (modified Stillman's technique) was instructed to the patient,

with the use of a soft bristled tooth brush. Patient was advised the necessary instructions. Increase in the attached gingival width after the 1st surgical procedure in relation to 41 and the root coverage achieved around 4 mm.

- **Treatment protocol**

Phase 1 therapy Full mouth scaling, root planing, and polishing in relation to 41 area was performed. Patient was inspired to improve her oral hygiene status, chlorhexidine mouth rinse 0.2% was advised after phase 1 therapy.

Phase 2 therapy Surgical phase : Gingival augmentation with free soft tissue graft was performed three weeks following phase 1 therapy. After disinfecting with 0.12% chlorhexidine mouth rinse, local anesthesia was injected to anesthetize the recipient site and donor site (palatal site). The beginning of surgery involved preparation of the recipient site apical to recession area. A horizontal incision along the mucogingival junction extending one tooth mesially and distally from affected area was placed using a bard parker blade of no.15. A tin foil template (sterilized inner portion of a blade packet) of the recipient site was prepared and was placed over the recipient site to facilitate the placement of incision. Free soft tissue graft was harvested from the palate and was adapted to the recipient site. Suturing was conducted using 5-0 catgut and periodontal dressing was placed to protect the surgical site. A periodontal dressing was placed over the donor and recipient sites. Patient was given a pain killer and antibiotic dose to prevent any

post op infection and pain (Cap Mox (500mg) TDS and Tab Enzoflam BID). Mechanical plaque control was avoided in the surgical site and dressing was removed after 10 days. Distance between the marginal gingiva and the CEJ was recorded at baseline, after 1 week, 1 month and 3 month.

**Results:** distance from the CEJ (cement enamel junction) to marginal gingiva

Baseline	1 week	1 month	3 months
5mm	3mm	1mm	1mm

- Significant increase in the width of attached gingiva was appreciated in about 4 weeks and around 3 to 4 mm reduction in the recession height was observed at the end of 3 months.

The palatal graft site healed completely within one month.

A gingival tissue coverage of 4mm was evident at the end of 3 months

Clinical attachment level

**DISCUSSION**

The structure of the gingival tissues is important for healthy gingival function. The presence of a thick keratinized gingival covering serves as an effective barrier that is resistant to the injury from the physical trauma of mastication and the thermal and chemical stimuli from the dietary components that have direct contact with the gingiva. The gingival

sulcus provides some amount of flexibility to the marginal gingiva as well as maintains an effective epithelial seal against tooth which is essential for periodontal health.<sup>[9]</sup> The free soft tissue graft used for the coverage of denuded roots is a versatile modality of treatment used in clinical situations. Problem areas with a lack of keratinized tissue and gingival recession can be effectively treated with free gingival graft to create an adequate zone of attached gingiva for the coverage of the exposed root. Areas of gingival recession, in the absence of a mucogingival problem, in which there is an esthetic consideration or root sensitivity can be also treated with a free gingival graft. The present case with inadequate width of attached gingiva along with Miller’s class II gingival recession was treated by a surgical approach for increasing the zone of keratinized gingiva. The various treatment modalities available for increasing the zone of keratinized gingiva are free gingival grafts, connective tissue grafts, and apically positioned flaps.

**History:** A free soft tissue autograft was harvested from the palatal tissue in this case for the same. Bjorn in 1963<sup>[10]</sup> and Sullivan<sup>[11]</sup> and Atkins<sup>[11]</sup> in 1968 were the first to describe the free gingival autograft. The autograft was initially used to increase the amount of attached gingiva and extend the vestibular fornix. In 1982 P.D Miller introduced the FGG for root coverage.

Free gingival graft procedure is simple and highly predictable when used to increase the amount of attached gingiva. In early stages, it is important to assure collateral circulation from the connective tissue bed bordering the defect. When recession is deep and the health of the marginal tissue cannot be maintained, the need for treatment is obvious and various types of soft tissue grafts may be performed. The autogenous masticatory mucosa graft (free gingival graft) has been shown by Miller, Holbrook and Ochsenbein, Tolme, and Borghetti, and Gardella to produce predictable root coverage.

Bjorn (1971) was the first to describe a technique in which a free gingival graft was first placed to enlarge the attached gingiva of the recipient area.

The main disadvantages of this technique are the presence of two wound areas, the unfavorable color match, the rough texture of the graft<sup>[12]</sup>, and the limitations connected with the extent of the donor area which restricts the area of gingival augmentation to three or maximum four teeth.

## CONCLUSION

Gingival augmentation procedures with the help of free gingival graft tissues performed in sites with an absence of attached gingiva associated with recessions provide an increased amount of keratinized tissue associated with recession reduction over a period of 3 months.

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**FIGURES:**



Miller's Class II recession At baseline (CAL: 5mm)



Preparing the recipient bed



Graft tissue harvested from the palatal posterior region



palatal graft tissue as per the template



Periodontal dressing placed over the recipient site



Graft tissue sutured in position



Results at one week post surgery (2mm reduction in clinical attachment loss)



results 1 month (CAL: 4)mm



results at 3 months (↓CAL by 4mm)

**Case 2:**



4 – 5 mm Gingival Recession



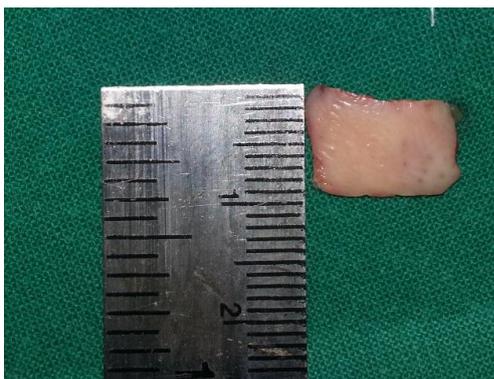
Preparation of recipient bed: Removal of the epithelial layer



Tin foil template for harvesting the graft



Incision for removal of the graft



11 mm by 0.9 mm graft tissue harvested





2 to 2.5 mm thickness of the graft tissue

Suturing of the graft tissue in place covering the de epithelialized recipient bed



One week post-operative photo showing regenerated tissue