

Clinical evaluation of the marginal gingiva as a donor tissue to augment the width of keratinized gingiva: Series of 2 cases with 3-year follow-up

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Abstract

The indications to increase the width of keratinized gingiva have not been proven beyond doubt; however it becomes indispensable in certain clinical situations. In spite of frequently encountered complications, palate is considered most preferred area to harvest the free gingival graft (FGG). This procedure aimed at investigating the potential of buccal marginal gingiva as a donor to augment keratinized gingiva. To the best of our knowledge, no such cases have been documented in the literature. FGG harvested from maxillary buccal marginal gingiva was used to augment gingiva in the mandibular anterior region for two patients. This not only improved plaque control but also resulted in acceptable esthetic results over 3 years. Furthermore, gingiva at donor sites gained its normal form and was in harmony with the neighboring teeth. It may be concluded that buccal marginal gingiva may provide a predictable substitute to other donor tissues to augment gingiva.

Keywords: Color, esthetics, free gingival grafts, keratinized tissue/surgery

Introduction

The importance of keratinized tissue around teeth and implants has long been debated. Although even the complete absence of attached gingiva is compatible with oral health,^[1] certain clinical situations require definitive gingival augmentation.^[2]

An epithelized autogenous masticatory mucosal graft procured from palate is preferred by most of the clinicians to increase the zone of keratinized tissue.^[1] However, it certainly has its disadvantages including “patch-like area” leading to compromised esthetics, also postoperative sequela on palate at times can be significant. This procedure aimed at investigating the potential of buccal marginal gingiva as a donor tissue to augment gingiva.

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Case Report

Clinical presentation

Two patients (25-year-old male, female aged 32 years) with Miller’s Class III gingival recession^[3] along with narrow keratinized gingiva in the mandibular anterior region reported to the Department of Periodontics, Post Graduate Institute of Dental Sciences, Rohtak, India in May 2010 [Figure 1a and b]. Initial periodontal therapy included sessions of oral hygiene instructions, scaling, and root planing. Despite their efforts and professional guidance, patients were unable to maintain effective oral hygiene in the mandibular anterior region. It was therefore planned to attempt a gingival augmentation procedure for both the patients. As both the patients had shallow palatal valves, it was decided to procure donor tissue from maxillary buccal marginal gingiva. Informed consent was obtained from the patients after explaining the procedure.

Case presentation

Following local anesthesia (2% lignocaine, adrenaline 1:80,000) the exposed root surfaces were planed using Gracey 1–2 curette. A horizontal incision was made with no 15 scalpel apical to the available keratinized tissue to prepare recipient bed [Figure 1c]. Muscle and loose connective tissue (CT) fibers were thoroughly scraped to prevent subsequent graft mobility. A horizontal incision was given at the base of gingival sulcus and at least 1 mm coronal to alveolar crest in relation to right and left maxillary first molars (16, 26) for case 1 and case 2 respectively [Figure 1d] to harvest donor tissue. Tissue measuring 3 mm × 9 mm was made free by sulcular incision and was trimmed to remove sulcular epithelium and to standardize its thickness. It was positioned on the recipient bed and secured in place with silk sutures (3-0 Ethicon non absorbable silk suture) [Figure 1e] and covered with Coe pack. Patients were refrained from

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brushing at the surgical sites and were instructed not to pull the lip or manipulate operated area for 2 weeks. Patients were instructed to rinse with 0.12% chlorhexidine twice daily for 2 weeks. Periodontal dressing and sutures were removed after 10th days.

Patients were recalled at 2nd and 4th week and then after every 3 months to monitor healing. Parameters recorded at recipient sites included plaque index (pi),^[4] gingival index (GI),^[5] width of keratinized tissue (WKT) that is, Corono apical width of graft at baseline; increased width of keratinized gingiva on recalls. At donor site PI⁴, GI⁵, probing depth and location of the gingival margin with respect to cementoenamel junction were recorded using Williams probe. Esthetics was evaluated at the end of 3 years using a qualitative questionnaire given to five masked examiners who rated the result as excellent, very good, good, fair, and poor.

At 3 months postoperatively when keratinization is expected to be complete, graft blended well with the adjacent tissues and was not clearly distinguishable [Figure 2a and b]. Increased gingival width following surgical procedure [Table 1, Figure 2c and d] improved oral hygiene and decreased gingival inflammation [Tables 2 and 3]. Gingiva at donor sites regained its normal form and contour at 3 months [Figure 3a and b]. Evaluation of esthetics demonstrated acceptable esthetic results wherein 80% and 60% examiners rated results as excellent for case 1 and case 2, respectively, while rest rated it as very good [Table 4].

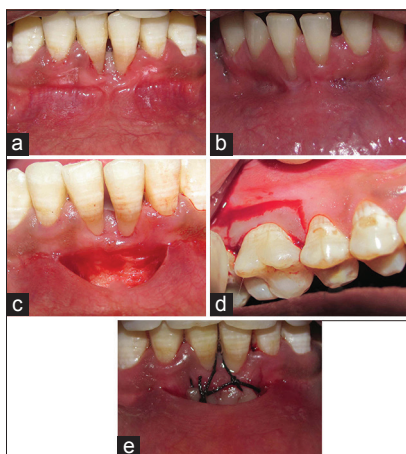


Figure 1: Preoperative view (case 1): Gingival recession with shallow vestibular depth and narrow band of keratinized gingiva in respect to 31, 41 (a). Preoperative situation (case2): Gingival recession along with shallow vestibular and narrow band of keratinized gingiva depth in respect to 41 (b). Recipient bed preparation apical to the available keratinized tissue (case 1) (c). Donor tissue was harvested from buccal marginal gingiva of maxillary first molar (case 1) (d). Graft was sutured on the recipient bed with silk sutures (case 1) (e)

Table 1: WKT (mm) at baseline and subsequent recall visits

| Patient | Baseline | Months | | | | |
|---------|----------|--------|-----|-----|-----|-----|
| | | 3 | 6 | 12 | 24 | 36 |
| 1 | 3 | 2 | 2 | 2 | 2 | 2 |
| 2 | 3 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |

*WKT: Width of keratinized tissue: Corono apical width of graft at baseline; increased width of keratinized gingiva on recalls

Table 2: PI scores at recipient sites at baseline and various follow-up

| Patient | Baseline | Months | | | | |
|---------|----------|--------|------|-----|------|------|
| | | 3 | 6 | 12 | 24 | 36 |
| 1 | 0.5 | 0 | 0.25 | 0 | 0 | 0 |
| 2 | 1 | 0.25 | 0.5 | 0.5 | 0.25 | 0.25 |

PI: Plaque index

Table 3: GI scores at recipient sites at baseline and various follow-up

| Patient | Baseline | Months | | | | |
|---------|----------|--------|-----|------|------|------|
| | | 3 | 6 | 12 | 24 | 36 |
| 1 | 0.25 | 0 | 0.5 | 0 | 0 | 0 |
| 2 | 1 | 0.5 | 0.5 | 0.25 | 0.25 | 0.25 |

GI: Gingival index

Table 4: Color evaluation at the recipient site at 3 years

| Patient | Examiner | | | | |
|---------|-----------|-----------|-----------|-----------|-----------|
| | 1 | 2 | 3 | 4 | 5 |
| 1 | Excellent | Excellent | Very good | Excellent | Excellent |
| 2 | Excellent | Excellent | Excellent | Very good | Very good |



Figure 2: (a) Final healing at 36 months (case 1): Note the presence of increased keratinized tissue and color match. (b) Final healing at 36 months (case 2): Note the presence of enough keratinized tissue and color match. (c) 2 mm gain in the width of keratinized gingiva following soft tissue graft at 36-month follow-up (case 1). (d) A gain of 2.5 mm in the width of keratinized gingiva following gingival augmentation was recorded at 36-month follow-up (case 2)



Figure 3: (a) Healing at donor site at 36 months: Note the normal form and harmony of gingiva with the adjacent teeth (case 1). (b) Maxillary first molar on the contralateral site: Note the comparable contour of the gingival margin (case 1)

Discussion

In past few years, esthetic results for augmentation procedures have become a prime concern for many patients and clinicians.^[6] In both the cases, the boundary between grafted tissue and surrounding gingiva could not be easily distinguished as can be seen by comparing pre and postoperative photographs. Whereas the color match of free gingival graft (FGG) from palate is not always predictable and often appears whitish and thick; with characteristic tire-patch appearance.^[7]

Subepithelial connective tissue graft (SECTG) often results in bulky tissue contour which mostly demands post healing gingivoplasty.^[8] Furthermore, harvesting SECTG can be a problem in individuals with inconsistent palatal anatomies. Research also suggests that deep palatal CT lack the full potential of inducing transformation to keratinized epithelium.^[6] Allografts (ADMA) offer the advantage of predictable color match but suffer poor predictability owing to considerable postoperative shrinkage and inconsistent quality of tissue gained.^[9]

It has been suggested that most of the graft shrinkage occurs within the 1st year of healing.^[10] In the documented cases, most of the postoperative shrinkage was complete by 3 months after which the results were maintained. A total shrinkage of 33.33% and 17.6% was observed for case 1 and case 2, respectively. Postoperative shrinkage using donor tissue harvested from the palate has been reported to vary between 30% and 50%^[11] while significant shrinkage up to 89.5% is reported with ADMA.^[8,12] Orsini *et al.* observed shrinkage of 43.25% after 1-year with free CT grafts.^[13]

Patients in the presented cases did not complain of any postoperative discomfort at both recipient and donor sites at any point of time. On the other hand, patients treated

with FGG harvested from the palate frequently experience postoperative pain and discomfort as a palatal wound is most of the times painful and slow to heal.^[14]

Another finding which supports this procedure is that the gingiva gained its normal form at donor sites in both the cases. This could be attributed to the inherent characteristic of periodontium to form a new “physiological” supracrestal gingival unit. Gingiva in documented cases was of a thick biotype which is known to predictably grow coronally to acquire healthy gingival sulcus.^[15] Chief limitation of this technique is limited availability of harvestable tissue; also tissue biotype should be cautiously evaluated.

It may be concluded that buccal marginal gingiva may provide a useful substitute to other donor tissues to augment gingiva.

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