

## Gingival unit transfer using in the Miller III recession defect treatment

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### Abstract

The most significant factor for the success in soft tissue grafts is the synergistic relation between vascular configuration and involved tissues. In the soft tissue graft procedures, site specific donor tissue is assumed to have improved potential for function and aesthetic survive at recipient sites. On a clinical level, using site specific gingival unit graft that placed on traditionally prepared recipient site, results in predictable root coverage. In this case report the clinical effectiveness of gingival unit transfer (GUT) technique performed on Miller III recession was presented and a similar recession case treated with free gingival graft (FGG)

technique for comparison. Probing depth, recession depth, keratinized tissue width and clinical attachment level clinical parameters were measured at baseline and postoperative 8 mo. Percentage of defect coverage was evaluated at postoperative 8 mo. Creeping attachment was assessed at postoperative 1, 3, 6 and 8 mo. The GUT revealed better defect coverage and creeping attachment results than the FGG in the treatment of Miller III defects.

**Key words:** Autografting; Gingiva; Gingival recession; Tooth root; Transplants

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**Core tip:** On a clinical level, using site specific vascular configuration gingival unit graft for donor tissue that placed on traditionally prepared recipient site, results in predictable defect coverage. This report was to evaluate effectiveness of gingival unit transfer technique in comparison with free gingival graft technique on clinical parameters in the Miller III recessions treatment.

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### INTRODUCTION

Gingival recession is the denudation of root surfaces as a result of the relocation of the gingival margin apical to the cement-enamel junction (CEJ)<sup>[1]</sup> that causes root hypersensitivity and aesthetic problems<sup>[2]</sup>.

Recession defects can be treated with numerous surgical procedures such as free gingival grafts<sup>[3]</sup>, connective tissue grafts<sup>[4]</sup>, acellular dermal matrix grafts<sup>[5]</sup>, various pedicle flaps<sup>[6,7]</sup>, combinations of



**Figure 1** Surgical procedures and follow-ups in treatment with gingival unit transfer and free gingival graft. Surgical procedures and follow-ups in treatment with gingival unit transfer: (A: Initial clinical appearance; B: Radiographic appearance; C: Recipient site; D: Donor site; E: Gingival unit graft; F: Gingival unit graft in place; G: 1 mo after surgery; H: 3 mo after surgery; I: 6 mo after surgery; J: 8 mo after surgery); surgical procedures and follow-ups in treatment with free gingival graft: (K: Initial clinical appearance; L: Radiographic appearance; M: Recipient site; N: Donor site; O: Free gingival graft; P: Free gingival graft in place; R: 1 mo after surgery; S: 3 mo after surgery; T: 6 mo after surgery; U: 8 mo after surgery).

these pedicle flaps and graft techniques<sup>[8,9]</sup> and guided tissue regeneration<sup>[10]</sup>. The literature review presents different rates of success and predictability with these surgical procedures<sup>[11-13]</sup>. Nevertheless, additional clinical studies are needed to define the issues that are in a relation with the predictable and successful results<sup>[12]</sup>.

The synergistic relation between vascular configuration and related tissues is one of the major factors for the success in soft tissue grafts<sup>[14,15]</sup>. Gingival tissue has complex and unique vascularity<sup>[16]</sup>. Supracrestal part of gingiva, as well as the donor tissue, is naturally created and specifically designed to function and survive above avascular denude root surfaces<sup>[14]</sup> in the soft tissue grafts procedures<sup>[17]</sup>. Gingival unit (GU) graft with site specific vascular supply placed on traditionally prepared recipient area may have capacity for survival on root surfaces and results in predictable root coverage<sup>[18]</sup>.

Most clinical studies about root surface coverage have focalized on Miller I - II recession treatment<sup>[19]</sup>. Defect coverage by using gingival unit transfer (GUT) on Miller I - II recession defects revealed successful results in a previous clinical study<sup>[18]</sup>. However, there is a lack of success and ability to provide root coverage in Miller III recession defects, because of interproximal bone and soft tissue loss<sup>[20]</sup>. There are different anatomical characteristics when compared with Miller I - II recession defects, as if prominent and avascular root surfaces, decreased periosteal bed and occasionally deep periodontal pocket depths<sup>[21]</sup>.

The purpose of this case report is to present the clinical results of two cases of Miller III localized recessions treated by using GUT and free gingival graft (FGG).

## CASE REPORT

In April 2009, a 25-year-old woman (case I) and 21-year-old man (case II) with single Miller III recession defects on mandibular right central incisor were applied to the Periodontology Department of Marmara University (Figure 1A, B, K and L). Case I had complaints about aesthetics and tooth loss whereas case II about hypersensitivity. Patients were non-smokers, did not have any medical problems and there were no contraindications for periodontal surgery. After clinical examination, oral hygiene motivation and mechanical periodontal treatment were performed.

Recession depth (RD) was recorded from CEJ to margin of the gingiva, probing depth (PD) was recorded from margin of the gingiva to the bottom of the pocket, clinical attachment level (CAL) was recorded from CEJ to bottom of the pocket, keratinized tissue width (KTW) was recorded from the margin of the gingiva to mucogingival junction, at baseline and postoperative 8 mo with a manual probe (PCP UNC-15, Hu-Friedy, Chicago, IL.). Only RD parameter was measured at 1, 3 and 6 mo for the evaluation of soft tissue creeping coronally.

One clinician (BK) performed surgical procedures

**Table 1** Clinical parameters at baseline (0 d) and 8 mo

Parameters	Case I gingival unit graft technique			Case II free gingival graft technique		
	0 d	8 mo	Gain	0 d	8 mo	Gain
Recession depth (mm)	3	0.5	2.5	4	2	2
Probing depth (midbuccal) (mm)	1	1	0	2	1.5	0.5
Clinical attachment level (mm)	4	1.5	2.5	6	3.5	2.5
Keratinized tissue width (mm)	2	7	5	1.5	6	4.5
Defect closure (%)		83			50	

and another clinician (SY) evaluated clinical measurements. Local anesthesia was made and then in both cases, the recipient site was prepared by two vertical beveled incisions that extending apically to adjacent teeth, 3 to 4 mm across to the mucogingival line, and the surfaces of interdental papillae was removed (Figure 1A, C, K and M)<sup>[14]</sup>. The incisions were divergent therefore the recipient site was trapezoidal. At the mucogingival line, vertical incisions were connected by a horizontal incision. A partial thickness dissection was made apical to the alveolar mucosa. The epithelial surfaces within these incisions were deepithelized. The base of the recipient site was  $\geq 5$  mm apical to the apical part of the exposed portion of the root surface. The root planning was made in the exposed portion of the root surface with hand instruments. Then irrigated with saline<sup>[18]</sup>.

In case I, the GU graft was harvested from the palatal part of the premolar area (Figure 1D) including the marginal gingival tissue and the papillae. In case II, the donor FGG was conventionally dissected from the palate aspect of the premolar area, but  $\geq 2$  mm apical from the margin of the gingiva (Figure 1N)<sup>[18]</sup>. In both cases, thickness of grafts were about 1 mm<sup>[22]</sup>. Then the grafts were sutured at the level to the CEJ (Figure 1E, F, O and P), and compressed for 2 min<sup>[18]</sup>. The periodontal dressing was applied to the donor sites for closing the wound. After 1 wk, the dressing and sutures were removed.

At the postsurgical care for infection control, the patients were advised rinse twice daily with 0.2% chlorhexidine solution for 3 wk, avoid brushing and hard chewing. After that, a gentle coronally directed brushing in the surgical area was recommended. During the first 2 mo recall appointments were scheduled every second week, and then patients were called once a month for the postoperative following period<sup>[18]</sup>.

At postoperative period in both patients clinical healing in both the recipient and donor sites was complete and no complications were observed. Pre (0 d) and postsurgical (8 mo) clinical parameters are shown in Table 1. At 8 mo, 2.5 mm defect coverage with a PD of 1 mm, CAL gain of 2.5 mm and KTW gain of 5 mm was observed in case I grafted with a GUT. Two millimetre defect coverage with a PD of

1.5 mm, CAL gain of 2.5 mm and KTW gain of 4.5 mm was observed in case II grafted with FGG (Table 1). Percentage of defect closure were 83% and 50% in cases I and II, respectively. The creeping attachment level in case I was 1.5 mm between 1 and 8 mo period (Table 2). The margin of the GU graft was moved coronally, and an acceptable colour and configuration harmony with adjacent gingival tissues was seen (Figure 1G, H, I and J). In case II, there was no color harmony with the adjacent tissue and 1 mm of creeping was detected at the same follow-up period (Figure 1R, S, T and U) (Table 2).

## DISCUSSION

GUT technique, using GU graft as a donor tissue with site specific vascular supply, was evaluated in treatment of a single Miller III gingival recession case. GUT is a modification of FGG with the difference of including marginal gingiva and papillae in the conventional palatal tissue graft that vascular supply matches intimately with the recipient site<sup>[14,18]</sup>. After 8 mo in this case, RD reduction and defect coverage were found in favor of GU graft compared to FGG.

This is the first case reporting the use of GUT technique in the Miller III localized gingival recession treatment. There are no clinical studies or case reports with which to compare our clinical outcomes. There is one case report in which gingival unit was used as a FGG<sup>[14]</sup> and a randomized clinical trial evaluating GUT in comparison with FGG in the Miller I - II recession defects treatment<sup>[18]</sup>. In this case report, the GU graft performed in the Miller III recession defect treatment, 2.5 mm of RD reduction; 83% defect coverage together with gains in CAL and keratinized tissue (KT) were reported. The reduction in recession was in accordance with the attachment gain. The mean defect coverage was 50% in the FGG case, presenting an obvious difference from the GUT case.

According to our clinical outcomes, GUT resulted in almost indistinguishable texture and colour with neighbouring soft tissues. Creeping defines the postoperative movement of marginal gingiva coronally<sup>[23]</sup>. Allen<sup>[14]</sup> presented equivalent results in his case report that the marginal position of the

**Table 2** Recession reduction in 1-3, 3-6, 6-8, and 1-8 mo periods

Recession reduction (mm)	Case I	Case II
1-3 mo	0	0.5
3-6 mo	0.5	0
6-8 mo	1	0.5
1-8 mo	1.5	1

GU graft is more coronal than the neighbouring gingival tissue at 3 mo. Creeping has been detected in several clinical studies<sup>[24-27]</sup>. With an average of 1 mm, creeping can be seen within 1-12 mo after FG in narrow recessions<sup>[25,26]</sup>. However, after 8 mo, the coronal ascent of gingival margins in case I, treated with a GUT (1.5 mm) was higher than in case II (1 mm). The unique vascular supply of GU graft is believed to be of importance for this difference<sup>[18]</sup>. The present outcomes support the usefulness of GUT for suitable root coverage in aesthetic areas. Although FG has lost its popularity for aesthetic area<sup>[28,29]</sup>, it may be still the gold standard surgical technique to increased KT<sup>[30]</sup> especially when it is modified with the inclusion of marginal and papillary gingival tissue.

The GU donor site healed uneventfully. No unacceptable attachment loss or recession were detected at the premolar site where the GU graft was harvested from in case I after postoperative 8 mo. Inevitable recession at donor site were reported in laterally positioned flap procedure<sup>[6]</sup>. This does not possible for GUT procedure. Harvesting donor graft with marginal gingiva is easy, less invasive. Any harmful results can be prevented with cautious manipulation. Before harvesting the GU graft, the depth of gingival sulcus at palatal donor premolar area was measured. Donor tissue was harvested carefully not to cause any attachment loss. If some injury had happened at the attachment, new attachment apparatus would have been developed quickly<sup>[31]</sup>.

In conclusion, the GUT technique performed on case I can be successfully used for the Miller III recession defect treatment.

## COMMENTS

### Case characteristics

Twenty-five (female) and 20-year-old (male) patients with Miller Class III localized gingival recession defects on mandibular anterior teeth.

### Clinical diagnosis

Miller Class III recession defect on mandibular anterior teeth.

### Treatment

One patient was treated with gingival unit transfer whereas the other with free gingival graft technique.

### Term explanation

Gingival unit graft is masticatory palatal tissue involving marginal gingival and papillary tissue.

### Experiences and lessons

Surgical treatment of Miller III gingival recessions are more challenging, due

to loss of interproximal bone and soft tissues. This case report represents the effectiveness of gingival unit transfer technique in comparison with free gingival graft technique on clinical parameters in the treatment of Miller III gingival recession.

### Peer review

This is an interesting case report.

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