

Case Report

Suture Less Gingival Augmentation Using Gingival Unit Transfer – A Case Report

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ABSTRACT:

The use of root coverage procedures to treat gingival recession defects, a common periodontal condition, is an important aspect of periodontal regenerative therapy. The synergistic relationship between vascular configuration and involved tissues is the most important factor in soft tissue graft success.

The present case reports the clinical effectiveness of Gingival Unit Graft (GUG) for the management of Miller's class III gingival recession. Clinical parameters like Probing depth, recession depth, keratinized tissue width and clinical attachment level were measured at baseline and postoperative 6 months. Percentage of defect coverage was evaluated at postoperative 6 months.

Healing was uneventful and 3mm root coverage was observed with 1mm residual recession and increase in keratinized gingiva after 6 months follow up.

Free soft tissue autografts such as gingival unit transfers can be used along with bio-adhesives such as cyanoacrylates for predictable results in the management of recession defects.

KEYWORDS: gingival recession, keratinized gingiva, free soft tissue autograft, cyanoacrylates

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INTRODUCTION:

Gingival recession is defined as the oral exposure of the root surface caused by a displacement of the gingival margin apical to the cemento-enamel junction, and it is frequently associated with dental aesthetic deterioration. The use of root coverage procedures to treat gingival recession defects, a frequently reported periodontal condition, is an essential consideration of periodontal regenerative therapy. Many surgical procedures can be used to treat recession defects, including free gingival grafts, connective tissue grafts, acellular dermal matrix grafts, various pedicle flaps, combinations of these pedicle flaps and graft techniques, and guided tissue

regeneration. The literature review reveals varying success rates and predictability with these surgical procedures^[1].

The synergistic relationship between vascular configuration and involved tissues is the most important factor in soft tissue graft success^[2]. The graft's vascular characteristics are most likely important for rapid anastomosis of the recipient site's capillaries with injured graft vessels^[3]. Fine blood vessels form a network in the gingival sulcus, and capillaries have numerous anastomoses^[4]. Because the gingiva's vascular plexus is rich in horizontal anastomoses that perfuse the marginal zone, marginal and interdental gingival tissues could be used to

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benefit from improved blood perfusion of the recipient site, improving graft survival^[5]. As a result, the supra-crestal part of healthy gingiva that included marginal and papillary tissues is thought to be the only soft tissue with a free marginal portion naturally established to survive and function over a vascular root surface^[3]. Other research has found that healthy gingiva has substantially different vascular patterns in the marginal, attached, and interdental gingiva^[6].

Site-specific donor tissue is presumed to have improved potential for function and aesthetic acceptance at recipient sites in soft tissue graft procedures. Clinically, using a site-specific Gingival unit graft placed on a traditionally prepared recipient site results in predictable root coverage. Gingival Unit Transfer (GUT) is a variation of Free Gingival Graft (FGG) that includes marginal gingiva and papillae in the traditional palatal tissue graft with a vascular supply that matches the recipient site intimately^[2].

Sutures have long been demonstrated to provide appropriate wound closure while having a low rate of dehiscence. However, their use in root coverage has some drawbacks. The main disadvantage is that it increases surgical time. It also traumatizes tissues, affecting vascularization and increasing the risk of flap tearing^[7]. Furthermore, based on the material, it can pinch and irritate patients or promote plaque accumulation, enhancing susceptibility to infection^[8].

Tissue adhesives, are biocompatible agents that, when applied to skin or mucosa, demonstrate a resistance to wound dehiscence via attractive forces between the tissue and adhesive molecules, and are an alternative to sutures. Because cyanoacrylates are biocompatible, biodegradable, hemostatic, and have a long half-life, they are an excellent adhesive agent for the oral environment^[9].

This adhesive was used as an adjunct to intraoral/extraoral wound suture by Nevins et al.^[10] because it can be implemented faster, prevents ischemia, and improves haemostasis. In general, a longer operative time has been linked to increased bacterial exposure, a greater amount of anaesthesia, and a higher morbidity rate. In this study, using cyanoacrylate tissue adhesive instead of suture resulted in a significant decrease in operative time (mean of 4.5 min) (mean of 8 min). According to Stavropoulou et al.^[11], the duration of treatment was 3-fold shorter with cyanoacrylate than it does with conventional suture.

The present case report describes utilization of gingival unit graft for gingival augmentation and stabilization of graft over recipient site using cyanoacrylates.



Figure 1



Figure 2

Figure 1&2: Recession of 4mm with inadequate keratinized gingiva & shallow vestibule.

CASE REPORT

A 24-year-old female patient came to the department of periodontology with a complaint of receding gums in the lower front tooth region & inability to maintain oral hygiene. Patient has a history of orthodontic treatment in her previous dental visit. Patient gives no relevant medical & family history. On intra-oral examination, mild supragingival calculus was present. Gingiva exhibits soft & edematous with rounded margins in relation to tooth #41. A 3.3 mm wide & 4 mm deep Miller class III gingival recession defect with inadequate keratinized gingiva was found on mandibular right central incisor. The probing depth was 1 mm and the CAL was 5 mm (Figure 1 & Figure 2). Patient also presented with mucogingival problems like shallow vestibule and frenal pull in relation to tooth #41. Patient was diagnosed as chronic generalized gingivitis with localized periodontitis in

relation to tooth #41. Initially phase-1 therapy i.e., full mouth scaling & root planing in relation to tooth #41 was done. After all the confirmed inflammatory signs were reduced after initial phase-1 therapy, Gingival Unit Transfer was planned to reduce the recession & to provide adequate zone of attached gingiva in relation to tooth #41.

Presenting problems in this case report were a 3.3 mm wide & 4 mm deep Miller class III gingival recession irt #41, inadequate attached gingiva (tension test positive) which leads to progressing gingival recession, inadequate depth of vestibule (inability to maintain oral hygiene) & frenal pull.



Figure 3: Two divergent vertical bevelled incisions given at recipient site



Figure 4: Recipient site prepared using split thickness dissection showing dehiscence.

METHODOLOGY:

After achieving adequate anesthesia, root planing was done in the exposed portion of the root surface and then irrigated with saline. The recipient site was prepared by giving two vertical beveled incisions that extended apically to adjacent teeth,



Figure 5



Figure 6

Figure 5&6: Gingival unit graft harvested from palatal aspect of #25

3 to 4 mm beyond the mucogingival line, and the surfaces of interdental papillae were removed. The incisions were divergent therefore the recipient site was trapezoidal. At the mucogingival line, vertical incisions were connected by a horizontal incision (Figure 3). A partial thickness dissection was made apical to the alveolar mucosa and care was taken to relieve the frenal attachment along with vestibuloplasty to increase the depth of vestibule. The epithelial surfaces within these incisions were de-epithelialized. After preparation of recipient site, dehiscence was found in relation to tooth #41 (Figure 4). The base of the recipient site was made 5 mm apical to the apical part of the exposed portion of the root surface. The Gingival unit graft was harvested from the palatal aspect of #25 including the marginal gingival tissue and the papillae (Figure 5 & Figure 6). The graft was placed over the recipient site and gentle pressure

was applied for 2-3 minutes for achieving primary fibrin stabilization and for preventing formation of dead space (Figure 7). Graft was stabilized using cyanoacrylates (AMYCRYLATE -ISO AMYL 2 CYNOACRYLATE). The donor site (palatal aspect of #25) was also covered with cyanoacrylate (Figure 8 & Figure 9). The operated site was covered using non eugenol periodontal dressing for protection which was removed after 1 week. At the postsurgical care for infection control, patient was advised to rinse twice daily with 0.2% chlorhexidine mouth wash for 3 weeks and asked to avoid brushing and hard chewing at the surgical site. 2 weeks post-operatively, recipient site showed complete healing with 5mm keratinized tissue gain and 1mm residual recession in relation to tooth #41 (Figure 10). Patient was recalled at 3 months and at 6 months (Figure 11 & Figure 12). The recession defect coverage was stable. The colour match of the graft with the adjoining tissues was acceptable aesthetically.



Figure 7: Graft placed at recipient site & stabilized using cyanoacrylates.



Figure 8: Donor site covered with cyanoacrylate.



Figure 9: Donor site covered with cyanoacrylate.



Figure-10: 1mm residual recession with 5mm keratinized gingiva & Increased depth of vestibule.

DISCUSSION:

Gingival unit transfer is a variation of the Free gingival graft that includes marginal gingiva and interdental papillae in the conventional palatal tissue graft whose vascular supply matches integrally with the recipient site, as described by Allen AL and Cohen DW^[12]. Gingiva has a distinct structure and properties^[13]. The gingival arterioles are oriented apico-coronally. Capillaries form repetitive networks in the marginal gingiva, and several small vessels form loops that extend towards the marginal gingiva. Furthermore, it has also been demonstrated that as gingival vessels extend coronally, their size and number decrease. Thus, in this modified technique, the donor tissue's size, number of vessels, and vascular configuration would better match those of the recipient



Figure 11: 1mm residual recession with 5mm keratinized gingiva & Increased depth of vestibule after 2 weeks.



Figure 12: 6 months post-operative follow-up photograph.

site, providing a desirable aesthetic outcome and tissue blend^[14]. A successful surgery requires wound closure. Inadequate suturing or postsurgical care by the patient could result in complications such as graft loss^[15].

A suture material with good capillary action acts as a wick, delivering serum fluid and bacteria, making it susceptible to complications and surgical failure. The angiographic analysis done immediately just after surgical treatment revealed that the micro-surgically operated sites had better vascularization with a mean percentage of $8.9 \pm 1.9\%$ compared to a macro-surgically treated sites with $8.0 \pm 1.8\%$, respectively. The observed difference provided evidence that a minimally invasive technique may result in less tissue trauma. It is possible that the reduced tissue damage was caused by the sharper and finer surgical blades and finer suture material used

during the microsurgical approach^[16].

Tissue adhesives could help with some of these issues. Tissue adhesives form a strong adherence surface, allowing the graft to be stabilized without perforating the flap and ensuring a better blood supply. Furthermore, they act as a barrier, securing the wound edges and preventing infection or graft detachment, attempting to make surgical techniques more predictable^[9]. It serves as a physical barrier over the donor site, promoting faster wound healing and increasing patient comfort.

As the cyanoacrylate is hard to control, it can get under the graft. Care should be taken while grafting larger areas with free soft tissue grafts, where there are chances for dead space formation which are considered as limitations of cyanoacrylates.

Jenabian et al.^[14] used a split-mouth design to treat 18 bilateral localised recessions (Miller Classes I and II) in nine systemically healthy patients. Gingival Unit Graft (GUG) produced higher aesthetic satisfaction at 1, 3, and 6 months, as well as higher root coverage at 1 month, according to the study. Furthermore, 11% of GUGs had complete coverage at 6 months, as well as a higher healing index and substantial reduction in recession width 3 months after surgery; however, the reduction in vertical recession depth (VRD) on this side was not statistically significant.

Kuru and Yildirim's^[3] study, included 17 patients who were randomly assigned to one of two groups. The authors discovered that the GUG group had greater vertical recession reduction, attachment, and keratinized tissue gain than the second group. Furthermore, the mean proportions of defect coverage in the GUG group were 91.62% and 68.97% in the FGG group ($P < 0.05$).

Sibel Kayaalti-Yuksekk & Emre Yaprak^[17] compared the usefulness of GUG with connective tissue graft using a randomized split mouth study to verify the clinical parameters and patient scores in gingival recessions. Sixteen patients with bilateral defects were chosen. SCTG or GUG was performed in thirty two defects. Clinical measurements, Recession coverage and patient outcomes were measured at baseline and at 1, 3 and 6 months. They concluded that GUG can be a suitable method for treatment of recession with inadequate Keratinized tissue width.

In a systematic review on comparison of gingival unit transfer and free gingival graft done by Chethana et al^[18], the authors could not prove the superiority of gingival unit transfer over Free Gingival graft. But, GUT showed higher percentage of sites with comprehensive root coverage than FGG.

CONCLUSION:

For predictable results in the management of recession defects, free soft tissue autografts such as gingival unit transfers can be used in conjunction with bio-adhesives such as cyanoacrylates. Although this technique is simple and minimally invasive, considerations such as proper plaque control, root surface biocompatibility, careful surgical manipulation, and tissue thickness have been shown to be critical and may affect the grafting procedure's outcome. Clinical trials are needed to demonstrate the efficacy of this technique in the treatment of class III gingival recession.

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Conflicts of interest

There are no conflicts of interest.

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