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Management Of Miller Class III Gingival Recession With Gingival Unit Graft Alone And Gingival Unit Graft With PRF Glue In Lower Anterior – A Case Series

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Abstract:

Gingival recession, characterized by the exposure of root surfaces due to the apical displacement of the gingival margin, poses challenges such as root hypersensitivity and aesthetic concerns. Various treatment options exist, including free gingival grafts and connective tissue grafts. But achieving root coverage in Miller class III recession defects remains challenging due to interproximal bone and soft tissue loss. Gingival unit (GU) grafts offer a promising solution, leveraging site-specific vascular supply to facilitate root coverage. This case report explores the clinical efficacy of gingival unit ,grafts in managing Miller III recession defects and evaluates the role of injectable platelet-rich fibrin (iPRF) to facilitate wound healing. GU grafts were harvested from the palatal aspect of maxillary premolars and adapted onto recipient beds at the cement-enamel junction. Injectable platelet-rich fibrin (iPRF) was utilized to enhance wound healing at donor sites. All three cases showed successful healing at both donor and recipient sites without complications. Patient 1 achieved complete root coverage at tooth 31 with significant improvements in keratinized tissue width and vestibular depth. Patient 2 exhibited partial root coverage at teeth 41 and 31, while Patient 3 achieved complete marginal recession coverage but experienced interdental papillary loss post- surgery. Despite this, the overall outcomes demonstrated the effectiveness of surgical interventions in addressing gingival recession and achieving desirable root coverage and tissue augmentation.

Keywords: Miller class III recession, PRF glue, i-PRF, Gingival unit graft.

Introduction:

Gingival recession is a condition where the denudation of root surfaces occurs due to the relocation of the gingival margin apical to the cement-enamel junction (CEJ), leading to root hypersensitivity and aesthetic problems. Treatment options include 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.[1] However, there is a lack of success in providing root coverage in Miller III recession defects due to interproximal bone and soft tissue loss.[2] Gingival tissue has complex and unique vascularity, and the supracrestal part of gingiva and donor tissue are naturally created and specifically designed to function and survive above avascular denude root surfaces in soft tissue graft procedures.[3]

Gingival unit (GU) grafts with site-specific vascular supply placed on traditionally prepared recipient areas may have capacity for survival on root surfaces and result in predictable root

coverage. Most clinical studies about root surface coverage have focused on Miller-I-II recession treatment, with gingival unit transfer (GUT) showing successful results in a previous clinical study. However, there is a lack of success and ability to provide root coverage in Miller III recession defects due to interproximal bone and soft tissue loss[4].

This case report presents the clinical results of two cases of Miller III localized recessions treated by GUT and free gingival graft (FGG). Gingival recession can increase tooth hypersensitivity, cause pain, root caries, unesthetic appearance of the gums, periodontal attachment loss, tooth loss, and make oral hygiene and plaque control difficult[6]. Root coverage treatments, such as free gingival graft, pedicle graft, connective tissue graft, coronally positioned flap, and guided tissue regeneration, can resolve these clinical problems. However, the selection of the method of choice depends on factors related to the defect, patient, and technique[9].

The gingival unit graft, a variant of free gingival graft (FGG), was first described by Allen AL and Cohen DW. This technique includes palatal marginal gingiva and interdental papillae without increasing the graft thickness. The current case series describes the clinical efficacy of the gingival unit graft in managing RT 2 recession defects in three subjects[5].

Platelet-rich fibrin (PRF) is the simplest and inexpensive procedure to use autologous glues. The blood is collected without any anticoagulant and immediately centrifuged, allowing for the easy collection of a leucocyte- and platelet-rich fibrin (L-PRF) clot[10]. The PRF clot forms a strong fibrin matrix and can be compressed to form a strong membrane[11]. The purpose of this article is to describe the use of PRF membrane as palatal bandage at the donor site of FGG and clinically assess the healing of donor sites[12].

Injectable platelet-rich fibrin (i-PRF) is a liquid form of platelet-rich fibrin obtained through low-speed centrifugation. It has numerous advantages, including increased growth factor release, collagen-1 synthesis, and osteoblast migration[7]. Studies have confirmed its ability to promote tissue regeneration and its feasibility as a regenerative adjunct to dental procedures. i-PRF has been found to reduce bacterial count, accelerate orthodontic tooth movement, periodontal regeneration, bone regeneration, and cartilage regeneration. Sub-gingival i-PRF injections can decrease bone loss and regulate inflammation, while bone regeneration increases osteoblast proliferation and attachment.in. The current study aims to evaluate i-PRF's role in wound healing in reception sites[8].

Inclusion Criteria

- Isolated or two adjacent Miller's class 3 gingival recession defects with a vertical depth ≥3 mm in mandibular anterior region.
- Teeth with identifiable CEJ.
- No active signs of periodontal disease with full-mouth plaque and full-mouth bleeding
- scores ≤15%, 4 weeks after Phase-1 therapy (measured at four sites per tooth).
- Nonsmoker, nontobacco user.

Exclusion Criteria

- Teeth in labio-version or malocclusion which might require orthodontic treatment prior to RC procedures.
- Presence of root caries or noncervical carious lesions.
- Pregnant or breastfeeding patients.
- Patients with systemic conditions or using drugs contraindicated for periodontal surgery.

Case 1:

A 36-year-old female patient reported to the Department of Periodontology, Sree Balaji Dental college and hospital, with the chief complaint of with sensitivity and receded gums in her lower front teeth region. She had no systemic disorders, drug allergies, or hospitalizations in her past medical history and had no restrictions on periodontal surgery. She was a non-smoker and had good oral hygiene. A periodontal examination revealed localized gingival recession, and marginal tissue inflammation. Gingival recession had progressed all the way to the mucogingival junction (MGJ) resulting in loss of attached gingiva. In the interproximal area of 31, there was also minor interdental soft tissue loss and an abnormal labial frenum attachment. Intra oral peri apical radiograph (IOPA) revealed interproximal crestal bone loss in relation to 31was diagnosed with class III recession defect based on clinical and radiographic data (Figure:1).

Case2:

A 29-year-old Female patient complaining of receding gums in lower front teeth, visited the Department of Periodontology, Sree balaji Dental college. The patient was a nonsmoker who had no medical history or pharmacological allergies. In regard to 31, 41, and 42, clinical examination revealed moderate plaque and calculus deposits, gingival recession, and aberrant frenum with shallow vestibule. Recession depths of 4mm, were measured at 31, respectively, with a probing pocket depth of 1mm. There was a minor rotation of 41. With regards to 42-32. Intra oral peri apical radiograph (IOPA) revealed interproximal crestal bone loss in relation to 31had millers III Gingival recession was diagnosed in 31(Figure:5).

Case3:

A 39-year-old Male patient reported to the Department of Periodontology, Sree Balaji Dental college, and hospital, with the chief complaint of presented with sensitivity and receded gums in her lower front teeth region. She had no systemic disorders, drug allergies, or hospitalizations in her past medical history and had no restrictions on periodontal surgery. She was a non-smoker and had good oral hygiene presented with a chief complaint of sensitivity and bleeding gums in the lower front tooth region. On clinical examination, the patient showed poor dental hygiene with deposits and generalised bleeding on probing. 31 and 41 exhibited localised gingival recession of 4mm and 2mm, papillary loss with aberrant frenal attachment and shallow vestibule, respectively. IOPA revealed crestal bone loss, and the patient was diagnosed with class III (Figure:9).

Treatment by Gingival unit graft alone/gingival unit graft with PRF glue:

Patients were educated about their clinical situation and treatment options, including gingival unit grafts for recession surgery. The treatment strategy was explained to patients, and written informed consent was obtained. Baseline clinical parameters such as recession depth (RD), probing pocket depth (PPD), clinical attachment level (CAL) and keratinized tissue width (KTW), were measured with a calibrated UNC-15 periodontal probe. After four weeks, patients

were scheduled for the surgical procedure after completing phase I therapy, which included scaling, root surface debridement, oral hygiene instructions, coronoplasty, and splinting in required sites.

Surgical sites:

The surgical procedure was performed under 2% lignocaine, 1:80,000 adrenaline. Deepithelialized is done exposing the connective tissue bed . Frenal tissue attachments in the area outlined were eliminated by sharp dissection. gingival unit grafts were taken from the palatal aspect of maxillary premolars in all three patients. Dimensions of the procured graft were in accordance with recipient site dimensions in terms of number of involved teeth included for recession coverage involving the marginal gingiva and interdental papillae. Excess fatty glandular tissue was trimmed off from the undersurface of the grafts if present and the thickness of the grafts were in the range of 1 to 1.5mm. The graft was then contoured, adapted and on to the recipient bed at the level of CEJ(Figure:2,6,11) with simple interrupted sutures at the margins using 3-0 resorbable sutures. PRF is placed in donor sites and 3.ovircyl suture is placed.i-PRF is injected in reception sites(figure:4,8,12).

Postsurgical care Antibiotics (amoxicillin 500mg, 8hrly) and analgesics (paracetamol 500mg, 8hrly) were administered for 5 days following surgery. Patients were advised to refrain from brushing and chewing hard food for 4 weeks. Use of 0.12% chlorhexidine mouth rinse twice daily was recommended for 1 month. At the end of two weeks, the periodontal dressing and sutures were removed. Recall appointments were set at four weeks, and once in every three months (Figure:3,7,10).

Results:

The surgical procedures in three cases showed successful healing at both donor and recipient sites without complications. Patient 1 achieved complete root coverage of 100% at tooth 31, resulting in a significant increase in keratinized tissue width (KTW) and vestibular depth. The aesthetic outcome was satisfactory, with a harmonious color match with surrounding tissues. Patient 2 had 75% root coverage at tooth 41 and 50% at tooth 31, possibly due to moderate bone loss at baseline. Despite these discrepancies, the graft showed an increase in KTW and vestibular depth. Patient 3 achieved complete marginal recession coverage of 100%, but persistent interdental papillary loss was observed post-surgery, suggesting a potential limitation or complication of the procedure. These results demonstrate the effectiveness of surgical interventions in addressing gingival recession and achieving desirable outcomes in terms of root coverage and tissue augmentation. However, the presence of interdental papillary loss in patient 3 underscores the complexity of periodontal procedures and the importance of comprehensive evaluation and management.

Discussion:

The outcomes of gingival unit transfer (GUT) have been extensively studied in Miller's class I and II recession defects, with limited reports addressing its efficacy in class III recession. Several studies have compared GUT with free gingival grafts (FGGs) in treating localized recession defects, consistently demonstrating favorable outcomes with GUT in terms of aesthetics, clinical parameters, and root coverage[(17)].

For instance, a randomized controlled trial (RCT) conducted by Kuru and Yildirim (2013) investigated GUT and FGG in mandibular anterior recession defects classified as Miller's class I and II. The study found that GUT provided superior aesthetic and clinical outcomes compared to FGG, with significantly higher root coverage percentages at an 8-month follow-up[(13,18)]. Similarly, another RCT by Jenabian et al. (2016) evaluated GUT and FGG in localized Miller's class I and II recession defects over a period of 6 months. The study reported greater aesthetic

satisfaction with GUT at all three time points assessed[14,19].

Despite limited evidence specifically addressing Miller's class III recession defects, case reports and studies have highlighted the potential benefits of GUT in these more advanced cases. Kuru and Yildirim (2015) examined GUT in mandibular anterior Miller's class III defects and observed better root coverage associated with creeping attachment at an 8-month follow-up. Similarly, a case report from 2018 documented complete root coverage in Miller's class III recession defects treated with GUT[15].

Recent research, such as an RCT by Sriwil et al. (2020) with a split-mouth design, further supports the efficacy of GUT in localized Miller's class I and II recessions. This study found that both GUT and FGG achieved statistically significant root coverage at 1 and 6 months post-treatment, with GUT demonstrating greater root coverage percentage and clinical attachment gain at both time points. Additionally, GUT resulted in a higher increase in keratinized tissue width at 1 month[16,18].

This case series adds to the growing body of evidence supporting the beneficial role of GUT in advanced recession areas, particularly in Miller's class III defects. The observed phenomenon of creeping attachment, characterized by the coronal movement of marginal gingiva post-operatively, is consistent with previous findings and contributes to the stability of root coverage achieved with GUT[20]. Despite challenges such as irregular alignment, bone loss, and mobility in some cases, the outcomes align with previous research and underscore the potential of GUT in achieving favorable results even in more complex recession cases.

The inclusion of marginal and papillary gingiva in the graft contributes to improved color adaptation and enhanced root coverage, further enhancing the aesthetic outcomes of GUT procedures. Overall, the findings of this research, including improvements in aesthetics, vestibular depth, and keratinized tissue width, along with acceptable root coverage percentages, highlight the promising role of GUT as a viable treatment option for advanced recession areas, leveraging its site-specific vascular supply for optimal outcomes.

Conclusion:

The study highlights gingival unit grafts (GUG) as a reliable and effective surgical approach for managing RT2 recession defects in the mandibular anterior region. Despite potential influencing factors like malocclusion and tissue thickness, GUG demonstrates predictability in achieving favourable outcomes. While further investigations are warranted to compare GUG with free gingival grafts, current evidence suggests its superiority in defect coverage, clinical efficacy, and aesthetic improvements, particularly in Miller Class I/II recession defects. GUG emerges as a preferred option, offering enhanced clinical and aesthetic results compared to traditional palatal grafts. In conclusion, GUG proves to be a predictable and efficient method for addressing Miller's class I and II recession defects in the mandibular anterior region, with the additional benefit of utilizing injectable platelet-rich fibrin (iPRF) in recipient sites to expedite healing compared to traditional graft techniques, further emphasizing its efficacy and viability as a treatment modality.

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Figure1: pre operative

Figure2: Free Gingival unit graft

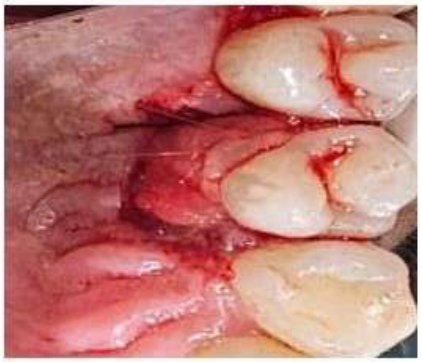

Figure3: PRF glues

Figure 4: 3.o vircyl suture

Figure5: Pre operative

Figure 6: De-epithelialized in 31,41

Figure 7: PRF glues

Figure 8: 3.o vircyl suture

Figure 9: Per operative

Figure 10: De-epithelialized 31

Figure 11: 3.0 vircyl suture

Figure 12: PRF gule