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Case Report

Treatment of Localized Gingival Recession with a Modified Laterally Positioned Flap Combined with Subepithelial Connective Tissue Graft-A Case Report

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ABSTRACT

Gingival recession, particularly in the anterior teeth, can lead to functional and aesthetic concerns. It can cause aesthetic deterioration, dentin hypersensitivity, and difficulties in maintaining proper oral hygiene. Multiple surgical methods have been utilized to treat gingival recession. This article presents a case where the lateral pedicle technique combined with a Subepithelial Connective Tissue Graft (SCTG) was successfully utilized to cover the exposed root surface of a single tooth. The adjacent soft tissue was repositioned over the recession defect, resulting in the establishment of an aesthetically pleasing and healthy periodontium, with positive patient satisfaction. Significant root coverage was achieved through this procedure, demonstrating its clinical effectiveness.

Keywords: Recession coverage, Grade III Miller, Laterally displaced flap, Connective tissue graft, localized gingival recession.

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INTRODUCTION

According to the results of the National Health and Nutrition Examination Survey (NHANES III, 1988-1994) carried out in the United States,[1] it was noted that more than 50% of the population exhibited gingival recession defects. These abnormalities are marked by the revelation of the tooth root surface and the development of dentinal hypersensitivity. In some cases, root exposure resulting in gingival recession can lead to dentin hypersensitivity, causing discomfort for the patient and potentially affecting their oral hygiene practices. Even without tooth hypersensitivity, the irregular outline of the gingival margin, especially in the presence of triangular-shaped recession with acute angles (referred to as "Stillman cleft"), can make plaque control more challenging for the patient. This may further contribute to difficulties in maintaining proper oral hygiene. In order to address these complications, periodontal plastic surgery known as the 'root coverage procedures' were introduced. The two primary techniques employed in this procedure were the coronally advanced flap and the laterally positioned flap.[2] To enhance the predictability of clinical outcomes, these techniques were combined with tissue grafts or biomaterials, which provided additional tissue/flap thickness and enhances tissue growth.[3,4] The Coronally Advanced Flap (CAF) technique has been extensively utilized for the treatment of gingival recession for the past fifty years.[5] There is substantial clinical evidence that supports the effectiveness and reliability of the Coronally Advanced Flap (CAF) technique, whether it is performed on its own or in conjunction with a tissue graft.[4] Another technique known as the Laterally Positioned Flap (LPF), which is also referred to as the sliding flap, lateral pedicle flap, or rotated flap, was initially introduced by Grupe and Warren Jr in 1956.[6] Under specific circumstances, it has been proposed that the Laterally Positioned Flap (LPF) can be carried out with or without the placement of a Subepithelial Connective Tissue Graft (SCTG).[8-10] The combination of the Laterally Positioned Flap (LPF) and Subepithelial Connective Tissue Graft (SCTG) has demonstrated several benefits. These include enhanced root coverage, decreased likelihood of gingival recession at the flap elevation site,[11,12] and the preservation of advantages associated with the LPF technique, such as flap flexibility and the attainment of predictable keratinized gingiva.[13]

The combination of CAF and Subepithelial Connective Tissue Graft (SCTG) is the most commonly employed technique among the various root coverage procedures. It is considered highly reliable for addressing Miller class I or II gingival recession defects, according to Miller's classification.[2-4,14] However, the effectiveness of this procedure for more advanced cases, such as Miller class III gingival recession with wide and deep defects, remains uncertain. While satisfactory clinical outcomes have been reported for

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treating Miller class III cases using CAF+SCTG, most of these cases initially presented with mild interproximal bone loss and minor-to-moderate gingival recession defects.[15]

In contrast, while the Laterally Positioned Flap (LPF) technique has not received as much research attention as CAF, the clinical results of these two procedures have demonstrated similarity.[4] In specific clinical situations where there is a limited amount of keratinized tissue below the recession defect and a shallow vestibule, LPF can be considered as an alternative to CAF for achieving reliable root coverage.[12]

CASE DESCRIPTION

A 23-year-old female came to the Department of Periodontology with chief complaints of sensitivity, bleeding and receding gum in lower front region and aesthetic concerns for past 6-7 months. The patient did not give any relevant past dental history and medical history. On clinical examination, none of the sites revealed more than 4 mm periodontal probing depth. There was Miller's Class III gingival recession (7 mm) with respect to 41 with labial frenal pull (Figure 1a) and Intra Oral Peri Apical Radiograph showed interdental bone loss (Figure 1b). Thorough Scaling and Root planning were performed and patient was recalled after 4 weeks for evaluation. The patient was verbally explained about the comprehensive treatment plan including Lateral (horizontally) displaced flap combined with a Subepithelial Connective Tissue Graft (SCTG). Written informed consent was obtained. Hematologic investigations (CBC, PT, aPTT, BSL) were within normal limits.

Surgical Technique: Preparation of recipient site

The surgical procedure began by administering local anesthesia (Lignocaine with adrenaline; 1:2,00,000; LOX 2%) on the recipient site. The exposed root surface was then carefully cleaned and smoothed using specialized curettes to eliminate any plaque buildup, and for reducing root prominence. Following this, the recipient bed is prepared by making a reverse bevel incision along the margin of defect surrounding the target tooth i.e., 41 to create an adequate union and healing of the repositioned graft exposing the underlying connective tissue. (Figure 1c). Using a number 15c blade, incisions were made horizontally and vertically over the donor site i.e., 42 to release the flap. A partial-thickness pedicle flap, obtained from an adjacent tooth, was then reflected, with its width exceeding 1½ times the area of gingival recession. (Figure 1d).

Harvesting a Connective Tissue Graft

In the initial stage, a Free Gingival Graft measuring 12 x 8 x 2 mm (Figure 1e) was harvested from the palatal site. This graft was later de-epithelialized to create a Subepithelial Connective Tissue Graft (Figure 1f). The size of the tissue graft was selected based on the dimensions of the recession defect and the flap elevation sites. The graft, positioned 1 mm below the Cementoenamel Junction (CEJ) level, was placed beneath the mesial and distal interproximal gingiva and secured with 5-0 Prolene sutures (Figure 1g). The partial-thickness pedicle flap was then rotated mesially to cover the exposed tissue graft and secured with 5-0 Prolene sutures (Figure 1h). The patient was advised to take Ketorol DT 10 mg as needed every 6 hr to manage

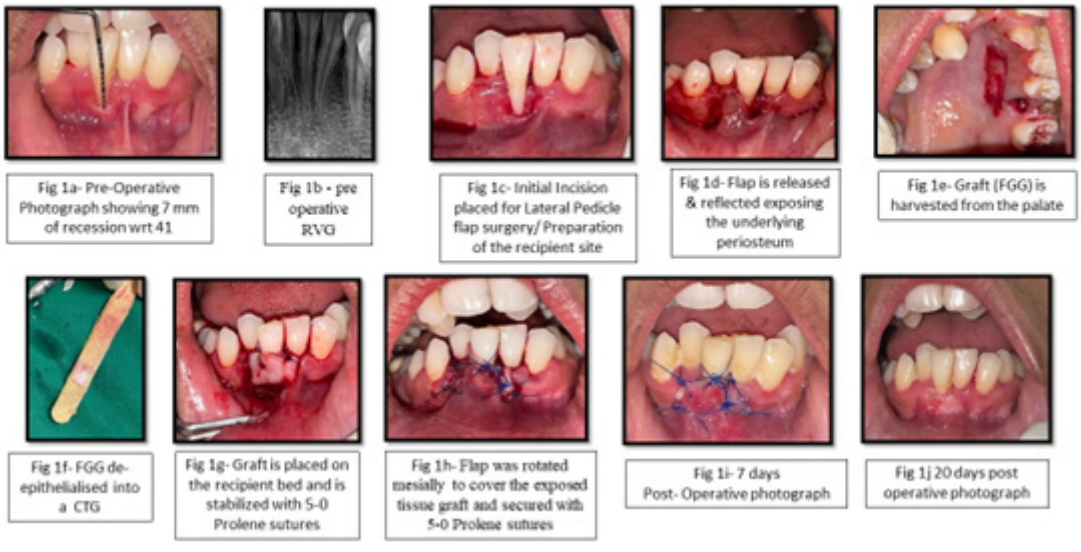

Figure 1: Clinical images. (a) Pre-operative RVG; (b) Pre-Operative Photograph showing 7 mm of recession wrt 41; (c) Initial Incision placed for Lateral Pedicle flap surgery/Preparation of the recipient site; (d) Flap is released and reflected exposing the underlying periosteum; (e) Graft (FGG) is harvested from the palate; (f) FGG de-epithelialised into a CTG; (g) Graft is placed on the recipient bed and is stabilized with 5-0 Prolene sutures; (h) Flap was rotated mesially to cover the exposed tissue graft and secured with 5-0 Prolene sutures; (i) 7 days post-operative photograph; (j) 20 days post-operative photograph.

any post-operative pain or discomfort. Additionally, they were instructed to rinse their mouth twice a day with half an ounce of 0.12% chlorhexidine for 30 sec to maintain surgical area hygiene during the first two weeks. The sutures were removed after two weeks, and the patient resumed their regular oral hygiene routine. Follow-up appointments were scheduled for 7, 14, and 21 days after the surgery (Figure 1i and 1j). After one month, approximately 60-70% of the defect was covered, and the probing depth remained within 3 mm. Long-term follow-up was planned. The patient expressed satisfaction with the results of the root coverage, and the symptoms of hypersensitivity had improved.

DISCUSSION

A review published in 1996[2] reported that the rotational flap technique, including the Laterally Positioned Flap (LPF) and a modified version called the Double Papilla Flap (DPF), achieved a mean root coverage rate of 63% based on 15 LPF studies and 2 DPF studies. These findings initially raised concerns about the predictability of the LPF technique among clinicians at that time. However, subsequent studies published after 1996 showed more positive outcomes for LPF, with root coverage rates comparable to those achieved with the Coronally Advanced Flap (CAF) technique or CAF combined with Subepithelial Connective Tissue Graft (CAF+SCTG).[4]

Several articles have documented the clinical outcomes of cases involving the combination of the LPF technique with SCTG.[7,16] In one study by Nelson,[7] the DPF combined with SCTG was used to treat a single tooth defect, while LPF combined with SCTG was employed for multiple defects. The results demonstrated successful clinical outcomes, even in cases of advanced recession, with an average root coverage rate of 88% for defects ranging from 7 to 10 mm in length during a follow-up period of 6 to 42 months. In another study by Ricci *et al.*,[16] a similar technique as Nelson[7] was employed. The root coverage rates achieved using this procedure for Miller class I or II cases were comparable to those obtained with the guided tissue regeneration technique at a 1-year follow-up. The mean initial defect sizes were 4.88 mm and 5.88 mm, and the root coverage rates were 80.88% and 77.08% for the LPF+SCTG technique and guided tissue regeneration technique, respectively.

In the present study, a root coverage rate of approximately 60% to 70% was achieved, which aligns with the results reported in previous studies. The selected case for the study involved Miller class III gingival recession with significant interproximal bone loss and limited keratinized gingiva, posing challenges for complete coverage of the tissue graft through coronal repositioning of the flap. While leaving the tissue graft exposed can be an option in certain cases, there are potential clinical risks associated with having an uneven gingival margin. Moreover, leaving a substantial portion of the connective tissue graft exposed on the avascularized root surface increases the risk of partial necrosis due to inadequate blood supply to the graft.

The LPF technique ensures that the Subepithelial Connective Tissue Graft (SCTG) is covered by a gingival flap, which provides lateral blood supply and enhances plasmatic circulation during the initial healing process. This helps mitigate the risks associated with graft exposure and improves the chances of successful healing.

The case described in this report involved placing the Subepithelial Connective Tissue Graft (SCTG) approximately 2-3 mm above the interproximal bone level. This decision was based on considering the biological width around the periodontium, rather than solely focusing on the Cementoenamel Junction (CEJ) level typically associated with achieving complete root coverage. It's important to note that complete root coverage is not typically expected in Miller class III cases. A previous retrospective study found that achieving complete root coverage in Miller class III recession cases is only possible under specific conditions. These conditions include having intact interproximal gingiva, a graft thickness exceeding 2 mm, interproximal bone loss within 3 mm, and an initial recession defect width not exceeding 3 mm.[17] However, the case discussed in this report did not meet all of these criteria.

To gain a better understanding of the relationship between interproximal bone level and the effectiveness of root coverage, further well-designed clinical studies are necessary. These studies would provide valuable insights and help establish a clearer connection between these factors. The utilization of the Laterally Positioned Flap (LPF) technique in conjunction with Subepithelial Connective Tissue Graft (SCTG) placement shows potential as a viable approach for managing Miller Class III featuring substantial interproximal bone loss and extensive recession defects. Nevertheless, in order to establish its effectiveness more convincingly, controlled studies need to be conducted in the future to gather additional clinical evidence. These studies would provide a more robust scientific basis and enhance our understanding of the efficacy of combining LPF with SCTG for treating these specific cases.

CONCLUSION

The utilization of the Laterally Positioned Flap (LPF) technique in conjunction with Subepithelial Connective Tissue Graft (SCTG) placement shows potential as a viable approach for managing Miller Class III featuring substantial interproximal bone loss and extensive recession defects. Nevertheless, in order to establish its effectiveness more convincingly, controlled studies need to be conducted in the future to gather additional clinical evidence. These studies would provide a more robust scientific basis and enhance our understanding of the efficacy of combining LPF with SCTG for treating these specific cases.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

LPF: Laterally Positioned Flap; **SCTG:** Subepithelial Connective Tissue Graft; **CEJ:** Cemento Enamel Junction; **CAF:** Coronally Advanced Flap.

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