

Evaluating the efficacy of laterally positioned flap in the management of Miller's Class I and II gingival recession: A 6 months follow-up study

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ABSTRACT

Background: The goal of the study is to evaluate the clinical effectiveness of a laterally positioned flap (LPF) 6 months after it was used to correct Miller's Class I and II gingival recession (GR) abnormalities. **Materials and Methods:** The LPF approach was used to treat 10 Miller's Class I or II GR defects of height ≥ 3 mm (n=10) on the labial surface of anterior teeth. At baseline, 3 months, and 6 months after surgery, clinical measures including probing pocket depth (PPD), clinical attachment level (CAL), width of attached gingiva (WAG), and height of GR (HGR) were measured, and percentage of root coverage was calculated. Data were gathered, and repeated-measures ANOVA with the *post hoc* Bonferroni test was used for statistical analysis. **Results:** All clinical parameters such as PPD, CAL, WAG, and HGR showed improvement. All of the evaluated clinical measures showed statistically significant changes at post-operative 3 and 6 months compared to baseline values. With $p < 0.001$, the HGR decreased from 3.21 ± 0.52 mm to 0.23 ± 0.65 mm at 3 months and to 0.36 ± 0.78 mm at 6 months. At 6 months, the average level of recession coverage was 97.93%. **Conclusion:** Employing the LPF technique led to substantially improved GR coverage, which effectively covered isolated deep narrow defects.

Key words: *Gingival recession, Lateral position flap, Root coverage*

Gingival recession (GR), which can be normal or pathologic, is defined as the apical movement of the gingiva, thereby exposing the root surface of the teeth. However, physiologic recession as a concept is not currently accepted. Nowadays, patients are more and more aware of GR and its unsightly characteristics [1]. Cementum and dentin exposure resulting in dentinal hypersensitivity becomes a continual source of discomfort for patients in daily life. GR is a frequent finding that gets worse as people get older and is more common in men. The exposed root surface caused by GR is vulnerable to caries, sensitive to heat stimuli, and also causes cementum to be abraded and eroded.² There may be pulp hyperemia and related symptoms.

To obtain reliable root coverage, numerous surgical techniques have been devised. Through a variety of techniques, gingival augmentation can be carried out either apical to recession or coronal to recession. Both the patient and the clinician should carefully assess the efficacy and predictability of different approaches [2]. A reduction in the number of procedures

necessary to meet the patient's esthetic requirements and financial considerations must be considered among patient-related issues. Correctional surgical treatments in Miller Classes I and II are more predictable, although the post-operative time and outcome are still significantly influenced by surgical technique, operator skill, and behavioral factors [3].

For the purpose of covering isolated recessions, Grupe and Warren suggested the lateral pedicle laterally positioned flap (LPF) flap surgery technique [4]. LPF is attempted when there is adequate keratinized tissue next to the area of GR that is wide, long, and thick. With a narrow mesiodistal dimension, this method works best for covering roots in case of GR. When there is enough donor tissue and vestibular depth available laterally, the LPF can be used to cover isolated denuded roots. Areas with insufficient attached gingiva at the site of recession and areas with sufficient gingiva in neighboring teeth are indicators for LPF. Insufficient donor tissue, a shallow vestibule, high frenum attachments, and deep interproximal pockets are all considered contraindications. The current interventional study's aim is to evaluate the efficacy of the LPF technique in isolated GR coverage.

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MATERIALS AND METHODS

Ten individuals with isolated GR (six men and four women) with the primary complaint of hypersensitivity or the appearance of long teeth in the mandibular anterior teeth were included in the study. Before the study’s commencement, the Institutional Ethics Committee approval was obtained. All of the patients who volunteered to take part in the study gave their written informed consent after receiving a thorough description of the process. The patients were between the ages of 20 and 50. Non-pregnant, non-smokers, no history of receiving antibiotic treatment within 3 months of the start of the study, good oral hygiene, and the presence of at least one Miller’s Class I or II deep narrow GR defect measuring ≥ 3 mm on the labial aspect of anterior teeth were the requirements for patient inclusion (Fig. 1). The gingiva on the tooth chosen as the donor site should be thick and wide enough to allow appropriate covering of the recipient site.

Clinical Parameters Assessed

- Probing pocket depth (PPD)
- Clinical attachment level (CAL)
- Width of attached gingiva (WAG)
- Height of GR (HGR) (Fig. 2).



Figure 1: Pre-operative image of Miller’s Class II gingival recession in relation to #41



Figure 2: Baseline measurement of HGR using Michigan ‘O’ probe with William’s markings

The above-mentioned parameters were assessed and noted down at the baseline, and post-operative 3 months and 6 months. All the other measurements were made using a Michigan ‘O’ probe with William’s markings and recorded in 0.5-mm increments. The same clinician did all the data collections and surgeries using the same instrumentation technique for all the patients.

Instructions on oral hygiene were the main part of the initial treatment. Techniques for maintaining oral hygiene that were inappropriate or flawed were corrected. In areas with GR, patients were instructed to use the Modified Stillman’s method of tooth-brushing. Before starting surgical therapy, scaling and root planning was performed. Typically, 10 days after the initial operation, a surgical appointment was scheduled.

On the scheduled appointment for recession coverage, the recipient sites were anesthetized using local anesthetic agent (2% lignocaine HCl and 1:80,000 epinephrine). To create a recipient bed, the marginal epithelium surrounding the tooth to be covered was excised. Using the number 15 BP blade, horizontal and vertical incisions are made over the donor site to release the flap. Donor tissue that was twice wider than the GR defect was procured by the partial-thickness pedicle flap from the neighboring tooth (Fig. 3). After that, the recipient site



Figure 3: Procuring LPPF from the adjacent tooth #42 to achieve recession coverage in relation to #41



Figure 4: Placement of the LPPF over the recipient site in relation to #41



Figure 5: Simple interrupted suture placed to secure in the flap in place

was covered with the LPF, and the graft was securely seated by applying finger pressure with a piece of gauze (Fig. 4). Following this, the flap was delicately sutured without tension using simple interrupted suturing technique (Fig. 5).

After the surgery, periodontal dressing was administered. To prevent post-operative discomfort and edema, the patients were discharged with post-operative instructions and medication (Amoxicillin 500 mg TID and Ibuprofen 400 mg BID) for 5 days. After 10 days, the patients were summoned back for a check-up and suture removal. The surgical site was checked to make sure healing which was uneventful. All the patients were recalled again at the post-operative 3 months and 6 months for follow-up and assessment of the clinical parameters.

Statistical Analysis

Statistical software was used to examine the clinical parameters’ measured values (SPSS version 20, IBM). A repeated-measures ANOVA with *post hoc* Bonferroni test was used to compare the baseline and post-operative values. Statistical significance was defined as $p < 0.001$.

RESULTS

None of the patients experienced any post-operative complications, and their healing was uneventful. There was improvement in all the clinical parameters PPD, CAL, WAG, and HGR (Table 1). Statistically significant differences in comparison with the baseline data were found at 3, and 6 months for all the measured clinical parameters. The HGR reduced from 3.21 ± 0.52 mm to 0.23 ± 0.65 mm at 3 months and 0.36 ± 0.78 mm at 6 months, with $p < 0.001$. The mean percentage of recession coverage obtained at 6 months was 97.93% (Fig. 6). Nine out of ten sites achieved 100% recession coverage.

DISCUSSION

There are several methods for treating GR problems, but they come with drawbacks such as a lack of accessible graft, compromised



Figure 6: Complete recession coverage achieved remained stable over a period of 6 months

Table 1: Assessment of the clinical parameters from baseline to post-operative 3 months and 6 months follow-up

Parameters	Values		p-value	Post hoc test
	Mean	SD		
PPD base	3.10	0.25	<0.001	B>3,6
PPD 3	1.02	0.12		
PPD 6	1.12	0.23		
CAL base	4.23	0.78	<0.001	B>3,6
CAL 3	1.10	0.42		
CAL 6	1.16	0.52		
WAG base	3.12	0.862	<0.001	3,6>B
WAG 3	4.27	1.28		
WAG 6	4.22	1.43		
HGR base	3.21	0.52	<0.001	B>3,6
HGR 3	0.23	0.65		
HGR 6	0.36	0.78		

Repeated measures ANOVA with *post hoc* Bonferroni test, PPD: Probing pocket depth, CAL: Clinical attachment level, WAG: Width of attached gingiva, HGR: Height of GR

patient appearance, additional surgical sites, postoperative difficulties, and a lack of cost-effective treatment options. Due to the autogenous character of the graft, LPF for the covering of denuded roots appears to be a procedure that can be employed effectively, efficiently, with little post-operative complications, predictably, and at a very low cost. Due to avoiding a second surgical site, patients also favor the approach. The findings of the current investigation are consistent with those of other studies on the therapeutic behavior of LPF in achieving recession coverage by Ricci *et al.* and Santana *et al.* [5,6] The reported mean percentage of root coverage ranges between 34% and 82% [7].

This method can be utilized to treat a single isolated area of GR if there are sufficient height, width, and thickness of attached gingiva nearby [8]. It is clearly stated that cases with sufficient height and width of attached of gingiva resulted in improved root coverage outcomes. The donor site should not be used if there is insufficient attached gingiva, fenestration, or dehiscence of the supporting bone. The chief advantage of this technique is that the flap is still connected at their base, allowing them to maintain their own blood supply while being transferred to a new location [6].

When compared to other surgical procedures, the treatment has various benefits. The donor site tissue’s morphology and color match that of the surgical site’s healed side. Due to the graft’s blood supply from the flap’s base, the survival of the flap and tissue uptake is superior.⁵ No additional surgical site is needed for the surgery to get the graft if LPF is employed. This process takes less time and is easy to complete. Unfortunately, this approach is ineffective if there are not enough nearby keratinized tissues or if the recession affects numerous teeth. In addition, they only have a restricted range of uses and are most effective for deep narrow Miller’s Class I and II recession defects [9]. To attain complete recession coverage, careful case selection is mandates as this approach cannot be used in all circumstances.

At the end of 6 months, there has been a statistically significant increase in WAG (Table 1). This seems to depend on the quantity of transplanted tissue and the resilience of the grafts. A summing effect between the variables promoting healing and the relatively unharmed blood supply within mucoperiosteal flaps might explain the positive findings of the study. The present study’s mean rise in WAG for LPF is comparable to results found by Santana *et al.* and Smukler [6,10].

CONCLUSION

For isolated denuded root surfaces, LPF is a dependable method. When compared to other mucogingival procedures, LPF is a straightforward surgical technique. It offers significant benefits like a single surgical site and good vascularity that aid in transplant uptake. Excellent coverage can be expected for Miller’s Class I and Class II situations employing lateral pedicle grafts and also color matching with the neighboring tissues in cases of single tooth or isolated GR. The obtained results remained stable during 6-months follow-up visit. Further, long-term randomized controlled clinical trials are necessitated to validate the clinical outcome obtained in the present study.

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