



Envelope Technique with Vestibular Releasing Incision - A Single Step Procedure for Root Coverage

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Authors' contributions

This work was carried out in collaboration between all authors. Authors KRP and PK wrote the protocol and wrote the first draft of the manuscript. Authors NA, DGN and VC managed the literature searches. All authors read and approved the final manuscript.

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Case Report

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ABSTRACT

Treatment of gingival recession in cases with a shallow vestibule and frenal pull are always challenging. Root coverage techniques have been continuously revised and simplified over the past few decades to obtain more predictable, esthetic, and stable results.

Case Presentation: Two healthy patients with isolated Miller's class I gingival recession, shallow vestibules, and frenal pull, were treated with an envelope technique using connective tissue grafts with vestibular releasing incisions in a single step procedure.

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Conclusion: The single step technique resulted predictable root coverage and increased width of keratinized gingiva. This technique promises to be a viable option for the treatment of isolated gingival recession associated with shallow vestibule and high frenal pull.

Keywords: Gingival recession; root coverage; envelope technique; connective tissue graft; vestibular releasing incision.

1. BACKGROUND

Gingival recession is defined as the displacement of the soft tissue margin apical to the cemento-enamel junction [1] and predisposes to root sensitivity and compromised esthetics. Root coverage techniques have been continuously revised over the past few decades to obtain more predictable, esthetic, and stable results [2-10]. Langer and Langer described the subepithelial connective tissue graft technique in which the connective tissue graft was covered by partial thickness coronally positioned flap [2]. Bruno has described a modified Langer and Langer technique with partial thickness horizontal incision at the interdental papilla and by avoiding vertical releasing incisions, thereby preserving the blood supply to the flap [3]. Raetzke reported an envelope technique by placing connective tissue grafts under the supraperiosteal envelope created around the denuded root surface [4]. This technique preserves the blood supply from interdental papilla to the grafted tissue by avoiding horizontal and vertical incisions and achieves early esthetic result.

Treatment of gingival recession associated with shallow vestibule and frenal pull is challenging. In the conventional two-step surgical procedure, an initial vestibuloplasty with a frenectomy/frenotomy procedure and a free gingival graft followed by a coronally positioned flap as a second step procedure was recommended. Free gingival grafts, however, result in a pale color of the regenerated tissue resulting in poor esthetic results [10]. Butler proposed a single step procedure avoiding a second procedure by utilizing a subepithelial connective tissue graft with a vestibular releasing incision [8].

This paper presents a novel procedure using envelope technique with vestibular releasing incision as a single step procedure for the treatment of isolated Miller's class I gingival recession associated with shallow vestibule and frenulum pull.

2. CLINICAL PRESENTATION

Two healthy patients with isolated Miller's class I gingival recession associated with shallow

vestibule and frenulum pull (Figs. 1a, 2a) who needed root coverage were selected from the department of Periodontics. Informed consent was signed by each of the subjects after thorough explanation of the nature, risks, and benefits of the associated procedure. Four to six weeks after preparation related treatment including scaling, root planning and oral hygiene instruction, the root coverage procedures were performed.

3. CASE MANAGEMENT

After administering local anesthesia (2% Lignocaine with 1:80,000 Epinephrine) to recession and palatal donor sites, the envelope flap was created by placing a partial thickness incision horizontally 3-5 mm into the adjacent papillae through gingival crevice (Fig. 1b). The partial thickness incision was converted into a full thickness incision from the base of the recession apically beyond the mucogingival junction. The full thickness incision was intended to preserve the apical blood supply to the surgical site. A connective tissue graft was harvested from palatal mucosa from distal of canine to mesial of the first molar region using the class II type A incision technique (L shaped incision) described by Liu and Weingold [11] (Fig. 1c, 1d). Root biomodification was performed using tetracycline HCl 250 mg mixed in 2.5 ml of distilled water as the root conditioning agent. It was applied to the root surface for 2-3 minutes to remove the smear layer. The procured connective tissue graft was placed underneath the envelope flap (Fig. 1e). After graft placement, pressure was applied over the envelope area using gauze soaked in saline. A superficial releasing incision was then placed on the labial mucosa at the vestibular fornix (Fig. 1f). This incision was intended to relieve the frenal and lip pull on to the recession site and help in proper healing by immobilizing the grafted site. The releasing incision is not placed too deep in order to preserve the blood supply to the grafted area from the apical blood vessels. If a thick frenal attachment is encountered, a frenotomy incision extending to but not including the periosteum is recommended. A horizontal crossed mattress suture was placed with 4-0 mersilk suture extending at least one tooth

mesial and distal to the recession site (Fig. 1g). This suture stabilizes the graft and helps to maintain intimate contact between graft and the recipient bed. Both the envelope site and donor site were covered by non-eugenol dressing (Coe-pack) after placing and adapting a properly shaped tin foil (Fig. 1h). The patients were prescribed antibiotics (amoxicillin 500 mg 8 hourly) for 5 days, analgesic (ibuprofen 400 mg 8 hourly) as required, and 0.12% chlorhexidine gluconate mouth rinses twice daily for 3 weeks. The patients were advised to follow routine periodontal mucogingival surgical postoperative instructions including discontinuing tooth brushing at the surgical site for the first 2 weeks. The sutures were removed from the donor and grafted sites after 1 and 2 weeks respectively.

4. CLINICAL OUTCOMES

Both patients showed uneventful healing without any adverse effects. A 3 month follow up examination revealed considerable amount of root coverage in both patients as well as an increase in width of keratinized gingiva (Figs. 1i, 2b).

5. DISCUSSION

Gingival recession associated with shallow vestibule and frenulum pull pull is not easily treated with a subepithelial connective tissue graft prior to vestibuloplasty and frenectomy. Patients are often reluctant to accept a two-step surgical procedure. Butler described a single step procedure using modified Langer and Langer technique with a vestibular releasing incision [8]. A modification of the Langer and Langer technique utilizes a horizontal incision on the interdental papillae which, however, may compromise the esthetic appearance of the grafted sight. The surgical technique described preserved the interdental papillae and provided a lateral blood supply to the graft and enhanced the initial healing [4,5]. In addition, a full thickness dissection was performed in the apical direction from the base of the recession beyond mucogingival junction in order to preserve the apical blood supply inside the flap. Preservation of the blood supply improves the nutrition to the graft, as shown by Mormann et al. [12,13]. A vestibular releasing incision was placed superficially at the fornix of vestibule, which was sufficient to relieve the frenal and lip pull on the flap. The superficial releasing incision is intended to preserve the blood supply from the periosteum and deep layers of the mucosa to the grafted

tissue [8,9]. Maintaining the blood supply is essential for a successful graft and successful coverage of the exposed root surface.



Fig. 1a. Pre-operative view showing class I gingival recession with shallow vestibule and frenal pull



Fig. 1b. Operative view showing preparation of envelop around recession



Fig. 1c. Operative view showing L shaped incision design on right palatal premolar region for harvesting connective tissue graft



Fig. 1d. Operative view showing harvested connective tissue graft from palate



Fig. 1e. Operative view showing connective tissue graft placed under envelop



Fig. 1f. Operative view showing superficial vestibular releasing incision



Fig. 1g. Operative view showing horizontal crossed mattress stabilizing suture



Fig. 1h. Operative view showing periodontal dressing (coe-pack) on grafted site



Fig. 1i. 3 months post-operative view showing complete root coverage



Fig. 2a. Pre-operative view showing class I gingival recession with shallow vestibule and thick frenulum attachment



Fig. 2b. 3 months post-operative view showing complete root coverage

6. CONCLUSION

The technique described resulted in predictable root coverage and an increased width of keratinized gingiva. This technique promises to be a viable option for the treatment of isolated gingival recession associated with shallow vestibule and excessive frenal pull.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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