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Treatment of Gingival Recession with Coronally Advanced FlapProcedure

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Abstract
Gingival recession is one of the most common esthetic concerns associated with the periodontal tissues. Gingival recession is the exposure of root surfaces due to apical migration of the gingival tissue margins. Coronally advanced flap (CAF) technique and its modifications have been proposed in the literature to correct gingival recession defects. This paper reports the treatment of multiple gingival recessions with the procedure involved utilization of coronally advanced flap. At the postoperative follow-up visits, the success of the surgical approach was confirmed by the absence of tooth sensitivity and presence of gingival tissue with normal color, texture and contour. An excellent aesthetical outcome was achieved and the patient was satisfied with the outcome.

Key words: root coverage, coronally advanced flap, gingival recession, muco-gingival surgery, aesthetic, coronally advanced flap, Miller class I

Introduction

Gingival recession is defined as the displacement of the soft tissue margin apical to the cement-enamel junction (1). Toothbrush trauma is the most common factor in initiation and progression of non-inflammatory, localized gingival recession, and is associated with several variables found to be erroneous and traumatic: tooth brushing frequency, brushing technique and use of hard bristle brushes (2-4). Another important risk factor for gingival recession is progressive plaque accumulation, which can induce periodontal destruction (5,6).
Gingival recession can be successfully treated irrespective of the technique utilized, provided that the biologic conditions for accomplishing root coverage are satisfied: no loss of inter-dental soft and hard tissue height (7).
The ultimate goal of a root coverage procedure is the complete coverage of the recession defect with good appearance related to adjacent soft tissues and minimal probing depth (PD) (7-10). Previous systematic reviews showed that several surgical procedures such as pedicle flaps, free soft tissue grafts, grafts or barrier membranes (BM) and combinations of pedicle flaps may be indicated to improve the coronal level of the gingival margin on the root surface (9,10), even if very limited data for epithelialized free gingival graft and laterally positioned flap are available (9). In addition, no difference between

resorbable and nonresorbable barriers in terms of mean root coverage was reported (9) and no clinical benefit following root conditioning was detected (9,11).
The coronally advanced flap (CAF) procedure is a very common approach for root coverage. This procedure is based on the coronal shift of the soft tissues on the exposed root surface (11). This approach may be used alone or in combination with soft tissue grafts, enamel matrix derivative (EMD), BM, platelet-rich plasma, acellular dermal matrix and living tissue-engineered human fibroblast derived dermal substitute (10-14). In this case report we represent root coverage with CAF.

Case description

A 37-year-old female patient was referred to our clinic complaining of the unaesthetic appearance and tooth sensitivity of her mandibular teeth. During the clinical examination, it was noted that there were multiple Miller's class I gingival recessions in teeth numbers 33 and 34. Gingival recessions were associated with toothbrush trauma (Figures 1 and 2). The teeth presented shallow probing depth with slide bleeding on probing.
33 and 34 teeth sides underwent an identical CAF procedure. After local anaesthesia,
root debridement and polishing of the exposed root surface was performed (Fig. 1a). No root conditioning was used. Two oblique, divergent beveled incisions extending beyond the mucogingival junction were made at the mesial and distal line angles of the most mesial and the most distal of teeth with gingival recessions. These incisions, together with the intrasulcular incisions along the mesial and distal recession margins,
designed the external surgical papillae. Horizontal submarginal incisions, made interproximally at CEJ level, created the interdental surgical papillae. Then the intrasulcular incisions, which extended horizontally to the most distal and the most mesial of the involved teeth, were made, leaving the gingival margin of the non-affected adjacent teeth untouched. All surgical papillae were dissected, split-thickness, up to the probeable sulcular area, keeping the blade almost parallel to the root.
The soft tissue apical to the root exposure (including the residual keratinized tissue) was elevated to full thickness by inserting a small periosteum elevator into the sulcus and proceeding in the apical direction to expose 3–4 mm of bone apical to the bone dehiscence. This was done to include the periosteum and the maximum soft-tissue thickness in the central portion of the flap covering the avascular root exposure. A gentle root debridement was performed by sharp curettes on the exposed root surfaces. The most apical portion of the flap was split-thickness to allow coronal repositioning of the flap without tension. To permit the coronal advancement of the flap, all muscle insertions present in the thickness of the flap were eliminated. This was done by keeping the blade parallel to the external mucosal surface.
Coronal mobilization of the flap was considered adequate when the marginal portion of the flap was able to passively reach a level coronal to the CEJ of all teeth with the recession defects. The flap should be stable in its final coronal position even without the sutures. Once coronally advanced, the flap partially

overlaid the soft-tissues mesial and distal to the receiving bed. These areas and the facial soft tissue of the anatomical interdental papillae were de-epithelialized to create connective tissue beds to which the surgical papillae and the peripherical portions of the CAF were sutured (Fig. 1d). A gentle root debridement was performed by sharp curettes on exposed root surfaces prior to suturing. Then, the flaps were repositioned coronally and stabilized with 5.0 interrupted sutures.

Post-operative maintenance

A protocol for the control of bacterial contamination consisting of doxycycline (100 mg bid for 1 week), 0.12% chlorhexidine mouth rinsing three times per day, and weekly prophylaxis was prescribed (Tonetti et al. 2002). Patients were requested not to chew rigorously and to avoid brushing and flossing in the treated area for a period of 2 weeks.

Figure 1. preoperative view of recession

Figure 2. sulcular and vertical incision placed

Figure 3. full cum partial thickness reflected

Figure 4. coronally displaced suture placed

Figure 5. Early post-operative view

Discussion

Treatment of gingival recession is becoming an important issue in clinical periodontology due to the increasing demand for cosmetic treatment. Problems relate particularly to the fact that very often, the patient exposes only the most coronal millimitres of the recession when smiling. Thus, only surgical procedures that provide the clinician with a very high percent of complete root coverage should be included in the mucogingival plastic surgical techniques.

The present study aimed at treating Millers Class I recessions, with a mean initial recession height of 3-4 mm. This type of defect could be treated with pedicle soft tissue grafts, free soft tissue grafts or combinations of the two. Among the pedicle grafts, the coronally positioned flap is one of the valid surgical options to cover exposed root surfaces. It has many advantages over other surgical procedures used to treat gingival recessions: it does not require a separate surgical site to obtain a graft, the tissue of the pedicle provides a perfect color/contour match with the surrounding tissue, the procedure is simple to perform, and does not require an extended surgical or recovery time. The true benefits for the patient are improved esthetics and the stability of the results overtime. In addition it is important to consider the patients tooth brushing technique for the long-term maintenance of the clinical outcomes achieved by any root coverage surgical procedure. Anatomical factors such as root prominence, depth of the vestibule, soft tissue quality must also be considered. Longitudinal studies with a longer duration and histological analysis have to be done for evaluating the success and stability of the surgical procedure.

Many studies and recent systematic reviews showed the importance of baseline recession depth in the treatment outcome. The results of the meta-analyses of controlled and randomized clinical trials published by Roccuzzo et al. (9) and Clauser et al. (10) showed a relationship between the initial recession depth and the final outcome of the surgical procedure, reporting that 'greater baseline recession depths were always associated with decreased complete root coverage'.

Following coronally advanced flap therapy of single recession defects, Pini Prato et al. (12) reported that the gingival margin, sutured, on average, 1 mm coronal to the cemento–enamel junction, remained stable at week 1, but shifted apically from weeks 2 to 4, uncovering the cemento–enamel junction in 60% of the sites with an average shift of 1.5 ± 0.6 mm. From week 4 to week 12 after the procedure, the gingival margin remained stable. Coronally advanced flap can be utilized when indicated.

Most of the studies support the hypothesis that therapy with coronally advanced flap alone can be successfully applied when the residual gingiva is thick and wide (9). Accordingly, the adjunctive use of a graft could be restricted to sites with thin and narrow residual gingiva. A potential alternative is the use of enamel-matrix derivative.

The present case could have been treated with other surgical procedures such as free soft tissue grafts along with coronally repositioned flap or using the tunnel technique to achieve esthetic results, but it would involve a palatal donor site. In the present case report, the coronally repositioned flap avoided an

additional surgical phase, donor site, and also provided tension free flap to adapt with good aesthetic results (9).

Maintaining good oral hygiene and using the appropriate oral hygiene aids and cleaning techniques should be reviewed. Patients with recession should always be made aware of the possibility that such areas can be surgically repaired. Before undertaking surgical or non-surgical forms of therapy for gingival recession, we must address the etiology of the problem. It goes without saying, that therapeutic interventions will be undermined in the long run if the cause of the problem is not removed. Once the etiology of the condition has been uncovered and addressed, we may proceed to plan a treatment to arrest or reverse the gingival recession (7,9,10). The treatment plan will be based on the severity of symptoms, the goal of the patient and the body of knowledge in the current literature. This case report indicates that teeth with multiple gingival recessions, associated with toothbrush trauma successfully treated by the coronally advanced flap. When used in indicated cases, this root coverage technique is less invasive for the patient, requires less chair-time and less surgical skill.

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