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# Surgical Management of Type II Gingival Recession: Success of the Displaced Flap Technique after Failure of the Raetzke Technique

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**Abstract :** Free gingival grafts are surgical procedures used to increase keratinized tissue and cover exposed root surfaces. Their success relies on proper periosteal circulation in the recipient bed and adequate graft immobilization. Introduced in 1963 by Bjorn and refined by Sullivan et al., these grafts vary in thickness, affecting their survival and appearance. They are beneficial for increasing keratinized tissue and modifying the gingival phenotype, but have limitations such as requiring a second surgical site and potential complications like pain and necrosis of the donor tissue. Alternatively, Emdogain, derived from enamel matrix, has transformed periodontal treatment by promoting regeneration and enhancing root coverage and aesthetics. The Raetzke and lateral pedicled flap techniques provide additional options for treating gingival recessions, each with specific pros and cons. A clinical case of a 27-year-old patient at the Mexican Center for Stomatology Campus Morelia is presented. The patient had gingival recession and an aberrant frenum after orthodontic treatment. Initial periodontal treatment included scaling, followed by two surgeries: a frenectomy and Raetzke technique, which failed with only a 3 mm gain. A subsequent laterally displaced flap technique achieved successful tissue integration, as confirmed in a review after 15 days.

**Keywords:** Raetzke technique, laterally displaced flap technique, periodontics, graft, gingival recession

## I. INTRODUCTION

Free gingival grafts are procedures used to increase the width of keratinized tissue and cover denuded root surfaces. Its effectiveness depends on the correct plasma circulation of the periosteum of the recipient bed. It is crucial that there is no dead space between the graft and the recipient bed, and immobilization of the graft is

essential for its success. Introduced by Bjorn in 1963 and refined by Sullivan et al, these grafts vary in thickness, which influences their survival and appearance [1-3].

They are indicated for the increase in keratinized tissue, deepening of the vestibular fundus and modification of the gingival phenotype to withstand chewing forces. In turn, we can establish that they are not feasible due to unpredictable root coverage and limitations in the patient's tolerance to the donor area. Grafts offer several advantages, among which are that they do not imply additional costs for the patient and have a large donor area. However, we found disadvantages such as the need for a second surgical site, pain, aesthetic alterations and bleeding, and the risk of necrosis of the donor tissue and unpredictable contraction [4-5].

An alternative that has generated a revolution in periodontal surgical treatments is the use of Emdogain, which is a derivative of the enamel matrix (DME) that improves periodontal regeneration. It facilitates the adhesion of blood clot cells to the root surface and stimulates the formation of new connective tissue. Allowing improved root coverage and keratinized tissue, positive effects on early wound healing and favorable aesthetic results [6,7].

**Raetzke technique**

In 1985, Raetzke presented the "envelope" technique for the treatment of isolated gingival recessions, using connective tissue grafts. This method consists of preparing a partial thickness recipient bed using dividing incisions, both apical and proximal to the recession. The graft is placed inside the prepared bed, in a kind of "envelope" that ensures adequate contact with the surrounding tissues to promote its support and vascularization [8,9].

The technique requires making semilunar incisions to create a receptor bed. The connective tissue injector is then introduced within this envelope, providing effective coverage of the exposed root. This approach minimizes surgical trauma and facilitates a favorable recovery. As such, Raetzke reported 80% coverage in exposed root areas, while Allen reported an 84% success rate. Compared to free epithelialized grafts, which have a 43% success rate [8-10].

It has been noted that its use is mainly for localized gingival recessions and is not recommended for generalized recessions. It is important to have adequate donor tissue, as a palate with thin tissue may limit graft availability. Furthermore, the method is not suitable for extensive recessions or for patients with insufficient palatal tissue, for this reason, it has been reported as minimally invasive and preserves the interdental papillae, avoiding the need for additional vertical incisions. However, the graft may not perfectly match the color of the recipient tissue, which may affect the final aesthetics. Over time, modified techniques, such as the intrasulcular access tunnel (IST), have been introduced, allowing multiple recessions to be treated at the same time and improving surgical access. These variants seek to optimize aesthetic results and ease of the procedure, although they may present additional challenges in terms of technical complexity [8,10-12].

**Lateral pedicled flap technique**

In 1956, Grupe and Warren described a technique to treat gingival recessions using a laterally displaced full-thickness flap. This technique, although innovative for its time, presented predictability problems, as the donor area often suffered from additional gingival recession and bone loss. In order to mitigate these problems, Staffileno in 1964 proposed using a partial-thickness flap instead of a full-thickness flap to reduce the risk of recession at the donor site [13,14].

The initial technique involved lateral displacement of the flap to cover the exposed root, maintaining blood supply to the tissue. However, problems associated with additional recession and bone loss in the donor area led to modifications such as submarginal incision to prevent bone exposure and the use of partial thickness flaps to minimize recession in the donor area [14].

The lateral pedicled flap (CPL) has been established as an effective technique for the treatment of unitary gingival recessions. It offers advantages such as better aesthetics, increase in keratinized gingival tissue, and reduction in hypersensitivity and cervical caries. However, it is not the best option in cases of excessive root prominence or insufficient buccal depth. For this reason, variations of the original technique have been developed, such as the one that uses different flap thicknesses (partial thickness at the level of the papillae and full thickness in the root area). This modified technique includes coronal sling sutures to anchor the flap, which improves root coverage and esthetics, although it may leave scar tissue at the donor site [13,15].

CPL is especially useful in isolated and narrow recession defects with a thick biotype periodontium and sufficient interdental papilla. It is contraindicated in cases of thin and edematous gums, and in teeth with excessive root prominence or in areas with insufficient apical keratinized tissue. The technique shows good aesthetic results with complete coverage of class I and II recessions in 62.5% of cases and partial coverage in 94%. The combination of CPL with connective tissue grafts (CTG) has proven to be very effective, achieving adequate root coverage and reducing sensitivity [5].

To perform the procedure, careful preparation of the recipient and donor site is required, with a focus on the preservation of papillae and correct root conditioning. After the intervention, it is recommended to use chlorhexidine rinses and refrain from brushing the treated area during the healing period. The sutures will be removed after two weeks, with follow-up at 8 and 15 days, and then at 1, 2 and 6 months [13-15].

## clinical case

This is a 27-year-old female patient who comes for consultation at the Mexican Center for Stomatology Campus Morelia in the periodontics clinic. She claims to have completed her orthodontic treatment a year ago, to be asthmatic and to be a non-smoker. The intraoral examination revealed a thick periodontal phenotype, the presence of an aberrant frenulum at the level of dental organ 31, with gingival recession of 8mm and a mesial probing depth of 3mm, buccal 1mm and distal 3mm. Radiographically, the presence of bony crests is observed. Figure 1.

Figure 1: Gingival recession in tooth 31, with minimal bone loss at radiographic level.

After performing periodontal phase 1 where brushing technique is instructed and scaling is performed, the first surgical time is scheduled in order to perform a frenectomy, after a month we proceed to the second surgical time where the Raetzke technique is performed in which a sucular incision with a 15c scalpel, subsequently the Orban scalpel was used without detaching the vertex of the papillae, in dental organ 31 extending it only 4mm towards mesially, distally and apically, subsequently it was confirmed that the flap was displaced. Figure 2.

Figure 2: incision with 15c scalpel and harvest of connective tissue graft on palate can be seen.

Partial thickness free gingival graft was harvested preserving the periosteum in the donor area. Before placing the injector in the recipient area, PrefGel was applied to the root surface for 2 minutes and washed with abundant physiological solution for 1 minute. Emdogain was then placed on the root surface and in the graft. Planes are approximated using 5-0 vicryl suture. To preserve the integrity of the palate, a Gelfoam sponge is placed in the donor area of the palate as a hemostatic and sutured with 3-0 silk. Accompanied by 60 acetate to cover the area.

After 8 days, the area of the palate is observed in the healing process; sutures are removed from the palate. The treated area of the recession is observed in the healing process. After 15 days, sutures are removed and dislodgement of the graft is observed. However, a gain of 3 mm was obtained. Figure 3.

Figure 3: suture of the surgical bed with 5-0 vicryl suture in order to approximate planes and the post-surgical area for gingival plastic surgery is presented.

After 4 months of determining the failure in the Raetzke technique, it was decided to intervene on the patient using the laterally displaced flap technique. A sulcular incision was made following the gingival margin, and scaling and root planing of the root surface were performed. of the dental organ 31. The mesial and distal papillae of the surgical area are de-epithelialized. Once the incisions were made, the flap was lifted with the Prichard periostotome and the fibers were disinserted in the apical area to move the flap and position it. PrefGel is applied to the root surface for 2 minutes, delimiting with gauze and a Lucas spoon, then washed with plenty of solution for 1 minute. Suturing was carried out with two simple stitches in the most coronal area of the flap at the level of the mesial papilla of dental organ 31 and subsequently the Emdogaine was placed on the root surface and suspensory stitches in the distal papilla. Emdogain is placed above the sutures at the end of this procedure. After 15 days. Removal of stitches. Where a correct integration of the tissue around the treated dental organ can be seen. Figure 4.

Figure 4: patient with post-surgical gingival recession is presented, laterally displaced flap technique is applied, reconstruction with suture and photo 15 days after its removal.

## Discussion

In the Raetzke technique, a success rate of 80 to 84% has been reported, compared to the 43% success rate when using free epithelial graft procedures[10]. This discrepancy between the success of the techniques is mainly due to the fact that the displaced flap has surgical limitations in thick periodontal biotypes, insufficient interdental papillae, in cases where swollen areas and teeth with excessive root portions are present [5].

## Conclusion

The success of the treatment is based on achieving the stability of the gingival graft mainly in the first post-surgical hours. For this reason, sutures play an important role, especially suprariostics to secure the injector in the recipient bed, as well as lateral sutures to prevent its dislodgement. On the other hand, 5-0 or 6-0 sutures should be chosen to have minimal trauma to the treated tissue.

Likewise, it is considered that the compression of the injector will avoid the presence of virtual spaces that will not allow correct irrigation of the injector. Therefore, the application of compressive sutures on the injector is essential to ensure that it has adequate blood supply and nutrition.

Postoperative care by the patient is important since it is recommended not to brush the treated area for three weeks; uncovering by the patient can also lead to failure.

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