

Gingival recession: how to choose the best surgical technique?

Abstract

Objective: To present the main decision-making criteria when choosing a surgery technique for the most variety forms of gingival recession.

Data sources: A bibliographic review was carried out with a search in the database: VHL Odontologia, Scielo and Pubmed on the subject.

Data synthesis: The fundamental criteria for determining the best surgery Technique I'm be used in the treatment of gingival recessions are: the classification of recessions, the location of the recession (maxilla or mandible), the fact that it is single or multiple, the presence or absence of keratinized apical or lateral gingiva, the recession, the thickness characteristic of the periodontal (periodontal biotype) and the skill of the operator.

Conclusions: The choice of surgery technique, with the objective of root coverage, must follow a careful assessment of clinical findings, diagnosis and operator skill. This increases the predictability of success of the surgery therapy I'm be used.

Volume 9 Issue 1 - 2024

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Received: February 02, 2024 | **Published:** February 22, 2024

Introduction

mucogingival problems, periodontal recessions (Figure 1) stand out with a high worldwide prevalence. They are characterized by the migration of the gingival margin to a position beyond the cemento-enamel junction, resulting in a larger clinical crown, and dentin hyperesthesia, greater susceptibility to root caries, greater accumulation of biofilm and inflammation may also occur.¹ The small height of the band of inserted keratinized mucosa may be related to the etiology of gingival recessions. This type of injury can also be caused by traumatogenic occlusion, inadequate tooth alignment, incorrect brushing, muscle insertions and high bridles.² Epidemiological studies have revealed great variation in the prevalence of gingival recession. A variation of 7 to 80% has been reported, with a tendency to increase with age and greater severity and prevalence in people with excellent oral hygiene.³ Root coverage procedures represent an important aspect in periodontal therapy, for correcting gingival recessions with aesthetic compromise, eliminating root sensitivity and reducing the risk of developing carious lesions on exposed root surfaces. There is a huge variety of surgical procedures aimed at correcting various changes, with the aim of restoring aesthetically and functionally the structures of the periodontium. The list of main techniques can be summarized as follows:

- Flap positioned laterally;⁴
- Double papilla flap;⁵
- Free gingival graft;⁶
- Subepithelial connective tissue graft;⁷
- Coronary positioning of the lunette flap;⁸
- Flap positioned coronally;⁹
- Guided tissue regeneration;¹⁰
- Acellular dermal matrix;¹¹
- Association of techniques.¹²



Figure 1 Gingival recession.

Check list for choosing surgical technique

Classification of recessions

The first suggested classification for gingival recessions consisted of four categories:¹³

- Deep and wide recessions;
- Shallow and wide recessions;
- Deep and narrow recessions; It is
- Shallow, narrow recessions.

This classification was widely used until the 1980s. However, some researchers found discrepancies in the results between examiners. Thus, a new classification based on the amount of interproximal periodontal tissues, bone and gingiva was proposed.

The most used classification is divided into four classes:¹⁴

- **CLASS I:** the recession does not cross the line mucogingival and there is no loss of interproximal tissues;

- **CLASS II:** the recession extends to or beyond the line mucogingival, without loss of bone or interproximal soft tissue;
- **CLASS III:** the recession extends to or beyond the line mucogingival, with bone or soft tissue loss apical to the cementoenamel junction;
- **CLASS IV:** the recession extends beyond the line mucogingival. The proximal tissues are located at the base of the RTM, involving more than one face of the tooth.

The prognosis for root coverage in classes I and II is 100%. For class III, total coverage is not possible. However, in class IV there is no predictability of root coverage.

In turn, some authors¹⁵ suggest three different types of gingival recessions, which are as follows:

- Retractions associated with mechanical factors, mainly brushing trauma;
- Retractions associated with localized inflammatory lesions, induced by bacterial plaque;
- Retractions associated with generalized forms of periodontal disease with destructive characteristics.

A recent study¹⁶ described a classification that aims to take into account the clinical level of insertion of the buccal and interproximal sites. Type 1 recession (RT1): gingival recession without loss of interproximal attachment. Interproximal CEJ not clinically detectable mesial or distal. Type 2 recession (RT2): gingival recession associated with loss of interproximal attachment. The amount of interproximal attachment loss (measured from the CEJ at the interproximal to the bottom of the sulcus/ interproximal periodontal pocket) is less than or equal to the loss of buccal attachment (measured from the CEJ at the buccal to the bottom of the sulcus/buccal periodontal pocket). Type 3 recession (RT3): gingival recession associated with loss of interproximal attachment. The amount of interproximal attachment loss (measured from the interproximal CEJ to the bottom of the interproximal sulcus/periodontal pocket) is greater than the buccal attachment loss (measured from the buccal CEJ to the bottom of the buccal sulcus/periodontal pocket) (Figure 2-4).



Figure 2 Type RT1 gingival recession.



Figure 3 Type RT2 gingival recession.



Figure 4 Type RT3 gingival recession.

Interproximal soft and/or hard tissue adjacent to a recession, there is no prediction of total coverage of the root, regardless of the surgical technique. This occurs because the interproximal bone level is responsible for nourishing the flap used for the attempted coverage. If there has been previous bone loss, the nutrition of the flap is partially compromised and this fact has a negative impact on coverage rates.¹⁷ Type RT1 recessions have a high predictability of successful root coverage (up to 100% coverage). Despite this, it is not possible to be sure of this total coverage, as other factors can directly influence the clinical result, such as the post-operative care provided by the patient, the patient's systemic condition and the operator's level of technical skill. RT2 and RT3 type recessions are not expected to have full coverage and this condition must be presented and discussed with the patient before the surgical procedure.¹⁸

Location of recession (maxilla or mandible)

Maxillary gingival recessions have a very important aesthetic component. Especially when recessions affect the front teeth and also when the patient's smile line is high. This situation contraindicates the free gingival graft technique for the treatment of maxillary gingival recessions.¹⁹ Another technique that presents a risk of developing scars on the vestibular surface, and is contraindicated in the upper anterior region, is the semilunar flap technique. This technique uses a semilunar incision made at the level of the mucogingival line. As it presents a contour that differs from the orientation of the blood vessels, a scar is expected that, in this region, compromises aesthetics. When used in the posterior region of the maxilla, as long as it does not compromise aesthetics, it has a good predictability of success, especially in shallow recessions of up to 2 mm in height.²⁰

Is the recession unit or there are multiple recessions?

There are some techniques that have low predictability of success in treating unitary recessions. One of them is the laterally displaced flap. This technique requires the presence of a large amount of keratinized gum lateral to the tooth that presents the recession to be indicated. In other words, if the tooth has a 5 mm width of recession, there would be a need for 10 mm laterally to this recession to use the technique. Therefore, the use of the lateral flap for the treatment of multiple recessions is practically unfeasible.²¹ Likewise, the envelope technique proposed by Raetzke in 1985 is mainly recommended for unitary recessions. It uses a connective tissue graft introduced from an incision in the gingival sulcus. Part of the graft may be exposed on the root of the tooth to be treated, as long as 2/3 of the graft is under the gums. In other words, if the recession is, for example, 2 mm high, a 6 mm long graft would be necessary so that 2/3 would be under the gum and 1/3 would be exposed over the root. Therefore, it would also be unfeasible to use this technique to treat multiple recessions due to the need for an extremely large amount of connective tissue.²²

Is there a keratinized gums lateral or apcal to the recession?

Initially, when we evaluate a recession, we must check the amount of keratinized tissue laterally and coronally to it. If the recession is unitary and there is a quantity of thick keratinized gingiva measuring at least twice the width of the recession, the lateral displaced flap technique is recommended. Under these conditions, this technique presents high predictability of root coverage and excellent aesthetics.²³ keratinized tissue in good condition, we must evaluate the remaining keratinized gingiva apical to the recession. If there is a thick gingiva with a band at least the same height as the recession, the coronally displaced flap technique is well indicated.²⁴ Both the lateral flap and coronal flap techniques used alone (without association with connective tissue graft) should only be used if the gingival remnant is thick. Otherwise, the chance of a recurrence of the recession is high.²⁵

Is the periodontal biotype thick or thin?

For the surgical treatment of periodontal recessions, it is extremely important to be aware of the risk of recurrence. Initially, we must act to eliminate or, at least, minimize the etiological factors involved in their development. Then it is important to evaluate the periodontal biotype of the region to be treated. In general, in the presence of a thick periodontium (Figure 5), the technique used can be a coronal or lateral flap without the need for interposition of a connective tissue graft. This thick characteristic of the periodontium provides excellent gingival adherence to the exposed root surface.²⁶ On the other hand, when there is a thin periodontium (Figure 6), it is interesting to consider a surgical technique associated with connective tissue grafting. This is due to the fact that the conjunctival graft has the characteristics of increasing gingival thickness and also increasing the range of keratinized gingiva even when applied under the alveolar mucosa.²⁷



Figure 5 Thick periodontal biotype.

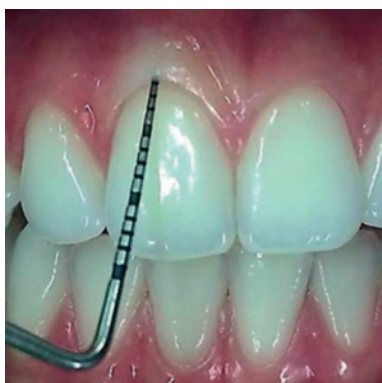


Figure 6 Thin periodontal biotype.

What is the operator's skill level?

The operator's skill is closely related to the choice of surgical technique in the treatment of gingival recessions. Due to the complexity of some techniques, it is reckless to perform some surgeries that require great technical skill, if the operator is still at an initial stage of skill. The operator should begin his surgical cases using techniques with a greater number of relaxing incisions, to facilitate maneuvers to displace the mucogingival complex with the aim of root coverage. The simplest technique would be the isolated coronally displaced flap (without association with the connective tissue graft) with two relaxing incisions going beyond the mucogingival line. With the advancement of time and the operator's skill, less invasive and more complex techniques can now be evaluated and used as long as they present good indications. In this context, surgical techniques associated with connective tissue grafting stand out, such as the Bruno, Zuchelli, tunneling and other techniques.²⁸

Discussion

Root coverage surgeries involve a wide range of procedures, from the simplest, such as coronal flap repositioning, to more complex and delicate procedures, such as gingival connective tissue grafting. The great advances in periodontal plastic surgeries are due to the incorporation of new materials into these procedures, in addition to the anatomical knowledge of the periodontium and understanding of the functioning mechanism of the mucogingival complex. Gingival recession is an unpleasant condition, with multifactorial etiology, consisting of a set of predisposing factors, associated with triggering factors, and can be localized or generalized. Longitudinal studies show that gingival recession can be found in patients with good or poor plaque control, affecting up to 100% of patients aged between 46 and 86 years, with a greater incidence on the buccal surface of teeth 34 and 44. In this sense, a study showed that there was no difference in patients with a height of 1 or 10 mm of attached gums in relation to gingival inflammation. However, some authors highlight that a small band of attached gums can act as an etiological factor for gingival recessions. But, according to other researchers, this concept of an adequate band of inserted gum necessary to prevent gingival recessions is not scientifically supported. For other authors, at least 3 mm of attached gingiva is necessary to resist efforts caused by indirect restorations. Gingival recession is related to several factors, such as the presence of gingival inflammation, tooth positioning and morphology, brushing trauma and orthodontic movement. However, several studies have concluded that orthodontic movement, in itself, is not an etiological factor for gingival recessions, and a careful inspection of the gums and bone of the teeth that will suffer pressure during orthodontic movement must be carried out. The presence of gingival recessions can lead to undesirable problems such as root sensitivity, aesthetic impairment, increased risk of caries on the root surface and loss of periodontal support, but it rarely leads to tooth loss. The laterally positioned flap technique emerged in the 1950s and is considered the precursor of root coverage surgeries. Although it provides an excellent aesthetic result in localized recessions, it is contraindicated for treating multiple recessions. Coronally positioned flap is an easy-to-perform technique that provides an excellent aesthetic result in the treatment of localized or multiple recessions. However, it is dependent on the adequate amount of keratinized gingiva located apical to the recession. In this sense, some authors achieved 97.8% root coverage using this technique in their patients, concluding that it is an effective procedure with many benefits. The root coverage technique with the greatest degree of predictability is the gingival connective tissue graft. The main advantage of this

procedure in relation to others is the double blood supply, which considerably increases the degree of predictability, therapeutic success and aesthetics, making it the first choice technique when it comes to root coverage. Free gingival grafting is a widely used type of periodontal surgery, mainly with the aim of increasing the range of keratinized mucosa inserted. However, it should only be used for root coverage purposes, in class I recessions in non-aesthetic areas.

Conclusion

1. Covering gingival recessions can be achieved using a variety of surgical techniques.
2. Free gingival grafting is contraindicated for root coverage of teeth in the maxilla and, in the mandible, it has a low predictability of success for covering multiple recessions due to the difficulty of receiving nutrition from the surgical bed. That is why we recommend this technique for root coverage of single-unit recessions in the mandible, which can be performed in one or two surgical procedures.
3. Laterally displaced flaps and double papilla flaps are techniques that require very precise indications, as well as great skill from the clinician to perform them. They have good predictability for success in unitary recessions.
4. Coronally displaced flaps (without association with grafts) are indicated for single or multiple recessions in both the maxilla and mandible. As long as there is keratinized gum and good thickness, they have high success rates in treating recessions.
5. Gingival connective tissue grafting, associated with different techniques, presents the best results in the treatment of gingival recessions.
6. The most advanced surgical techniques, such as tunneling, wide coronal flaps without relaxing incisions and combination of techniques, should be used, especially by more skilled operators. Beginners may initially benefit from less complex surgical techniques such as isolated coronal glide techniques and the Langer and Langer technique.

Acknowledgments

None.

Conflicts of interest

The authors declare that there is no conflict of interest.

Funding

None.

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