MUCOGINGIVAL LESIONS IN THE CONTEXT OF THE 2017 CLASSIFICATION OF PERIODONTAL DISEASES

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ABSTRACT

Gingival recession is defined as an apical displacement of the gingival margin in relation to the enamel–cement junction; this is associated with loss of attachment and exposure of the root surface in the oral environment. Although the aetiology of gingival recessions remains unclear, some predisposing factors have been suggested. The proposed clinical elements for a classification of treatment-oriented recession are the depth of recession, gingival thickness, and clinical attachment level. Although they do not necessarily lead to dental loss, gingival recessions result in a decrease in the patient’s quality of life through complications that may occur in their presence (dental hypersensitivity, root lesions or aesthetic disorders). Cairo proposed a classification of types of recessions and the classification of periodontal diseases in 2017 includes additional information such as periodontal biotype, severity of recession, residual gingival size, presence / absence of caries and non-carious cervical lesions, patient’s aesthetic concern and presence dentinal hypersensitivity. The purpose of this paper is to present a clinically oriented classification of mucosal diseases and to define the impact on the patient of localization of these conditions in terms of aesthetics, dentinal hypersensitivity and changes of the root surface at the level of the cervical area.

Key words: gingival recession, periodontal biotype, dentinal hypersensitivity, dental aesthetics

INTRODUCTION

Mucogingival lesions are a group of changes in superficial periodontal soft tissue that affect a large number of patients. Lack of keratinized tissue and gingival recession are the most common. It has been concluded that a minimal amount of keratinized tissue is not required to prevent attachment loss when good conditions are present. However, the attached gingiva is important for maintaining gingival health in patients with deficient plaque control [1].

Lack of keratinised tissue is considered a predisposing factor for the development of gingival recessions and inflammation. Gingival recession tends to
increase with patient age and is found in heterogeneous populations (with high and low oral hygiene standards) [2].

The presence of recession is aesthetically unacceptable for many patients; moreover, it may be accompanied by dentinal hypersensitivity; the areas of the denuded root are exposed to the oral environment and may be associated with carious and non-carious cervical lesions such as abrasion or erosion.

The aim of this paper is to present a clinically oriented classification of mucogingival lesions, especially the gingival recession, and to define the impact on the patient of the localization of these conditions in terms of aesthetics, dentinal hypersensitivity and root-surface modification at the level of the cervical area.

Normal superficial periodontal tissues

Within the individual variability of anatomy and morphology, "normal mucogingival status" can be defined as "absence of pathology (ie, gingival recession, gingivitis, periodontitis)". There may be extreme conditions without obvious pathology where the deviation from what is considered "normal" in the oral cavity is outside the range of individual variability. In fact, a well-documented clinical observation is that a healthy periodontal status can be maintained despite the lack of keratinized tissue, as well as in the presence of a low frenum, if the patient applies appropriate oral hygiene measures and professional maintenance in the absence of other factors associated with increased risk of developing gingival recession, gingivitis and periodontitis [1, 3]. Therefore, what could make a difference for the need for professional intervention is the patient’s behaviour regarding oral care and the need for orthodontic, implant or restorative treatment.

One way to describe individual differences is "periodontal biotype" (also called morphotype or phenotype). The evaluation of periodontal biotype is considered relevant for evaluating the results of therapy in several dental disciplines, including periodontal and implantary, prosthetic or orthodontic therapy. Generally, the distinction between the different biotypes is based on the anatomical characteristics of the components of the masticatory complex, including 1) the gingival biotype, which includes in its definition the gingival thickness (GT) and the keratinised tissue width (KTW); 2) bone morphotype (BM); and 3) the size of the teeth.

A systematic review [4], using previously reported parameters, classified periodontal biotypes into three categories:

- Thin biotype in which there is an association with a thin triangular dental crown, subtle cervical convexity, interproximal contacts close to the incisal margin and a narrow KT area, thin, delicate gum and a relatively thin alveolar bone.

- Thick biotype, which can be found in the presence of square-shaped dental crowns, pronounced cervical convexity, greater apical proximal interproximal contact, a large area of KT, a thick gingiva and relatively thick alveolar bone.

- Thick biotype with a thick fibrous gum, thin teeth, a narrow KT area and a pronounced scalloped gingival aspect.

The influence of the position of the teeth in the alveolar process is important. The buccal-lingual teeth position shows increased variability in GT; a vestibular position of the teeth is often associated with thin gingiva and bone [5]. Generally, the thin periodontal biotype tends to develop more gingival recessions than the thick biotype [3].
**Gingival recession**

Gingival recession is defined as an apical displacement of the gingival margin relative to the enamel-cement junction (CEJ) [6]; this is associated with the loss of attachment and the exposure of the root surface in the oral environment. Although the aetiology of gingival recessions remains unclear, several predisposing factors have been suggested: thin periodontal biotype, an aggressive toothbrushing technique, subgingival prosthetic thresholds, orthodontic movements, persistent gingival inflammation despite appropriate therapeutic interventions, and association inflammation with limiting access to effective oral hygiene, the position of the vestibule that compromises an effective oral hygiene and / or tissue deformities.

The proposed clinical elements for a classification of treatment-oriented recession are the depth of recession (the deeper the recession, the lower the possibility of complete coverage) [7], the gingival thickness (a gingival thickness <1 mm is associated with a low probability for complete root coverage) and clinical attachment (loss of interproximal attachment reduces the full root coverage potential) [8, 9].

A modern classification of recession based on interdental CAL measurement was proposed by Cairo et al. [10] (Figure 1).

- **Type 1 recession (RT1):** Gingival recession without any loss of interproximal attachment.
- **Type 2 recession (RT2):** Gingival recession associated with loss of interproximal attachment but loss of interproximal attachment is less than or equal to loss of buccal / oral attachment
- **Type 3 recession (RT3):** Gingival recession associated with loss of interproximal attachment; the loss of interproximal attachment is greater than the

![Figure 1. Cairo classification of gingival recessions; a:RT1, b:RT2, c:RT3](image)

This classification goes beyond some of the widely used Miller categorization limitations, such as difficult identification between Class I and II, and the use of "bone loss or soft tissue" as an interdental reference to diagnose periodontal damage in the interdental area [11]. In addition, Miller's classification was proposed when recession coverage techniques were "in early childhood", and the prognosis of potential root coverage in the four Miller classes no longer corresponds to the results of treatment of the most advanced surgical techniques.

The Cairo classification is a treatment-oriented classification to predict the potential for root coverage by evaluating interdental CALs. For Cairo RT1 (Miller Class I and II) 100% root coverage may be provided; in Cairo RT2 (overlapping with the Miller III class), some randomized clinical trials indicate a limitation of interdental CAL loss where root coverage is 100% predictable by applying different root coverage procedures; in Cairo RT3 (overlap of IV Miller class) it is not possible to completely cover the roots [9, 10].

**Clinical complications associated with gingival recession**

The presence of the gingival
recession is associated with several clinical problems that pose a challenge in choosing or not surgery. A basic question to answer is: what happens if an existing gingival recession is left untreated? A meta-analysis evaluated the long-term outcomes of untreated gingival recession [12]. The authors concluded that untreated gingival recession in subjects with good oral hygiene is likely to lead to an increase in recession depth during long-term follow-up. Limited evidence, however, suggests that the presence of KT and / or thicker gingiva decreases the likelihood of increasing the depth of the recession or the development of a new gingival recession. Even though the progression of gingival recession does not seem to affect the long-term survival of teeth, it can be associated with problems such as aesthetic complications or dentinal hypersensitivity.

Aesthetics becomes a dominant concern for patients, especially when dental treatment is needed. However, most articles published on this subject did not take into account the results reported by the patient [13]. A study by the American Academy of Cosmetic Dentistry (2013) consisting of 659 interviews showed that 89% of the patients decided to start dental treatment to improve physical attractiveness and self-esteem [14]. In a study, patients' perceptions of buccal frontal recessions and their treatment demands were assessed through a questionnaire. Out of 120 enrolled patients, 96 had 783 gingival recessions, of which 565 were unacceptable. Of the 218 perceived recessions, 160 were asymptomatic, 36 had dentinal hypersensitivity, 13 aesthetic problems and 9 aesthetic problems + hypersensitivity. Only 11 patients have requested treatment for the 57 recessions. The authors concluded that the perception of gingival recessions and patient treatment demands should be carefully evaluated before starting the treatment.

Dentinal hypersensitivity (DH) is a common, often transient, condition. Short, sharp pain resulting from stimulation of exposed dentine and resolving it by removing stimuli can affect the quality of life [15, 16]. Treatment modalities include the use of different agents applied to root surfaces or surgical root coverage processes [17, 18].

Various dental conditions, including root caries 67 and non-carious cervical lesions (NCCL) [19], may be associated with a gingival recession. Recent studies have found a prevalence of NCCL ranging from 11.4% to 62.2%. A common finding is that the prevalence and severity of NCCL seems to increase with age [20, 21].

The clinical impact and prevalence of root lesions, hypersensitivity and aesthetic concern of the patient associated with gingival recession indicate the need to change the 1999 classification of gingival-mucosal deformities and conditions.

The new classification includes additional information such as periodontal biotype, severity of recession, residual gingival size, presence / absence of caries and non-carious cervical lesions, aesthetic concern of the patient and the presence of dentinal hypersensitivity (Table 1).

<table>
<thead>
<tr>
<th>1. Periodontal biotype</th>
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<tbody>
<tr>
<td>a. thin scalloped</td>
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<td>b. thick scalloped</td>
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<tr>
<td>c. thick flat</td>
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<table>
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<th>2. Gingival/soft tissue recession</th>
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<tr>
<td>a. facial or lingual surfaces</td>
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<tr>
<td>b. interproximal (papillary)</td>
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<tr>
<td>c. severity of recession (Cairo RT1,2,3)</td>
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<tr>
<td>d. gingival thickness</td>
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<tr>
<td>e. gingival width</td>
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<td>f. presence of NCCL/cervical caries</td>
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<td>g. patient aesthetic concern (Smile Esthetic Index)</td>
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<td>h. presence of hypersensitivity</td>
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| 3. Lack of keratinized gingiva    |

28
4. Decreased vestibular depth
5. Aberrant frenum/muscle position
6. Gingival excess
   a. pseudo-pocket
   b. inconsistent gingival margin
   c. excessive gingival display
   d. gingival enlargement
7. Abnormal colour

Table 1. Mucogingival deformities and conditions around teeth (modified from the AAP 1999 Consensus Report, after Cortellini et al., 2018) [22]

Periodontal health can be maintained in most patients under optimum oral hygiene, even with minimal amounts of keratinized tissue. However, there is an increased risk of developing or progression of gingival recession in cases with thin biotype, poor oral hygiene and requiring restorative / orthodontic treatment.

The development and progression of gingival recession is not associated with increased teeth loss. However, it causes aesthetic concerns in many patients and is frequently associated with the occurrence of dentinal hypersensitivity and carious / non-carious cervical lesions on the exposed root surface.

Numerous therapeutic solutions for recession defects have been proposed in the periodontal literature and modified with time according to the evolution of clinical knowledge. Careful case selection and surgical management are critical if a successful outcome is to be achieved [23].

CONCLUSIONS
A new treatment-oriented classification is proposed, based on periodontal biotype assessment, severity of gingival recession and associated cervical lesions to help with therapeutic planning.

REFERENCES