

Original Article

Occurrence, Extension and Severity of the Gingival Recession in a Greek Adult Population Sample

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Abstract

Background and aim. The aim of the present study was to evaluate the frequency, extension and severity of the gingival recession in a Greek adult population sample.

Materials and methods. The study was performed on 800 patients, 336 males and 446 females between 18-77 years old, which sought dental treatment in a private dental practice. All measurements of recession depth and width were done with a periodontal probe and under sufficient illumination. The type of gingival recessions was evaluated based on Miller's classification. Statistical analysis was accomplished using chi-square test.

Results. The overall plaque indices were significantly reduced from 39.37 ± 20.76 to 20.62 ± 13.42 using the tooth wipe, and from 35.82 ± 16.82 to 19.70 ± 11.15 using the manual brush ($P = 0.000$). There were no significant differences between tooth wipe and manual brush for removing plaque at total surfaces ($46.01 \pm 17.2\%$ vs. $47.73 \pm 17.04\%$, $P = 0.75$) and proximal surfaces ($28.76 \pm 23.15\%$ vs. $43.71 \pm 23.77\%$, $P = 0.06$). However, the plaque reduction at buccolingual surfaces by tooth wipe was significantly higher than that by manual brush ($79.37 \pm 23.54\%$ vs. $56.83 \pm 22.33\%$, $P = 0.001$).

Conclusion. Considering the high prevalence of this clinical study, implementation of oral hygiene instructions and conducting analytical and experimental researches would be a necessity.

Key words: Adults, epidemiology, gingival recession, Miller's classification.

Introduction

Gingival recession a common and undesirable condition,^{1,2} characterized by the displacement of the gingival margin apically from the cemento-enamel junction (CEJ) and the exposure of the root surface to the oral environment.^{3,4} For a patient, gingival recession

usually creates an esthetic problem, especially when such problem affects the anterior teeth and causes anxiety of tooth loss due to progressing destruction. It may also be associated with dentine hypersensitivity and/or root caries and abrasion and/or cervical wear and erosion lesions because of the exposure of the root surface to the oral environment and an increase in the

accumulation of dental plaque.^{5,6}

The etiology of gingival recession is multifactorial. Several factors may play a role in recession development, such as excessive or inadequate teeth brushing, destructive periodontal disease, tooth malpositioning, alveolar bone dehiscence, thin marginal tissue covering a non-vascularized root surface, high muscle attachment, frenal pull and occlusal trauma.⁶ Other causative factors that have been reported are iatrogenic factors related to reconstructive, conservative, periodontologic, orthodontic or prosthetics treatment.^{6,7}

Miller⁸ classified gingival tissue recessions and predicted the outcome of corrective surgery based on his classification. In Class I defects, the gingival recession does not involve the inter-proximal papillae or the mucogingival junction. In Class II the recession extends past the mucogingival junction but does not involve the inter-proximal tissues. The recession in a Class III defect involves the inter-proximal papillae and in Class IV there is marked loss of the inter-proximal papillae.⁹ Surgical correction of gingival recession is often required, together with restorative therapy and/or orthodontics. Total correction, however, may be difficult or impossible, depending on the level of inter-proximal bone and soft tissues.

It is clear that the role of prevention is quite important especially in young people, including the proper use of the available means for dental plaque control, cessation of smoking and regular dental follow-up. The occurrence of gingival recession in a given population is a basic need for its prevention and control and allows the proper planning of health centers based on information on the prevalence and severity of these lesions, in order to establish proper and effective preventive programs. Therefore, the present study aimed at assessing the prevalence and severity of gingival recessions in adult subjects attending a private practice.

Materials and Methods

The study population of the present study comprised 800 adult patients aged from 18 to 77 years who sought dental treatment in a private practice. All participants were informed on the evaluation to which they would be submitted. The sample included 336 males and 446 females, adding up to 18,545 teeth.

Inclusion Criteria

The patients of both genders were divided into 4 groups according to the age range: group I-18 to 29 years: 205 patients; group II-30 to 39 years: 190 patients; group 4-40 to 49 years: 210 patients and group

IV-above 50 years: 195 patients. The selection criteria comprised age above 18 years and a mean number of 20 natural teeth, since large numbers of missing teeth might interfere with the results of the present study.

Exclusion Criteria

Third molars excluded from the study.

Oral examination

The participants of the present study were evaluated by a dentist; the teeth and gingival were dried with compressed air while dental unit light was used as the light source for the inspections.

Probing Depth Data

A millimetered periodontal probe marked up to 15 mm (Goldman-Fox/Williams DE probe, PD: PGF/W, Chicago, IL) was employed for evaluation of the teeth of each patient by a dentist, concerning the presence of gingival recession which was recorded whenever there was more than 1.0 mm of root surface exposed. Six aspects were evaluated in each tooth: mesio-buccal, mid-buccal, disto-buccal, mesio-buccal, mesio-lingual, mid-lingual and disto-lingual and linear measurements were obtained from the cement-enamel junction up to the gingival margin in the teeth presenting with gingival recession, in order to evaluate the vertical (apico-coronal) width of the recession.

In cases where the cement-enamel junction was covered by calculus, hidden by a restoration or lost due to caries or wear lesions, the location of such junction was estimated on the basis of the adjacent teeth, similar to a previously used methodology¹⁰. Since the presentation of gingival recession varies widely in the population, classification systems have been established to better describe it. An early study of recession associated with mandibular incisor teeth used the descriptive terms "narrow," "wide," "shallow," and "deep" to classify recession into four groups.¹¹

Another study classified gingival recession into "shallow-narrow" defects as less than 3 mm in both dimensions, and "deep-wide" defects as more than 3 mm in both dimensions.¹²

The Index of Recession (IR) was introduced by Smith.¹³ Recession was described by two digits separated by a dash (for example, F2-4), and the prefixed letter F or L denotes whether the recession is on the facial or lingual aspects of the tooth. If an asterisk were present, it would denote involvement of the mucogingival junction. The digits describe the horizontal and vertical components of a recession site in that order. The horizontal component is expressed as a whole

number value (from the range 0–5) depending on what proportion of the CEJ is exposed on either the facial or lingual aspects of the tooth, between the mesial and distal midpoints.

Nordland and Tarnow¹⁴ presented a classification system for loss of papillary height.

In a study by Marini et al,¹⁵ three categories were established according to the apico-coronal dimension of the root surface exposed by the gingival recession: slight recessions-less than 3.0 mm of root surface exposed; moderate recessions-3.0 to 4.0 mm of root surface exposed; extensive recessions-more than 4.0 mm of root surface exposed to the oral environment. The recessions were further scored according to the classification by Miller in 1985⁸.

Statistical Analysis

The data from 4 distinct regions were investigated, the anterior region (canine to canine) and the combined posterior regions (premolars and molars) in the maxilla and mandible. Statistical analysis was accomplished using chi-square test.

Results

Gingival recession was observed in 428 patients out of all patients corresponding to almost 53.5% of the sample. From these patients, 7,894 displayed root surface exposure ≥ 1.0 mm, corresponding to almost 42.6% of all teeth evaluated and adding up to 14,158 sites with gingival recession. Prevalence of recessions between males and females was not statistically significant. Among the patients of the present study, more than 77.9% who presented with gingival recession belonged

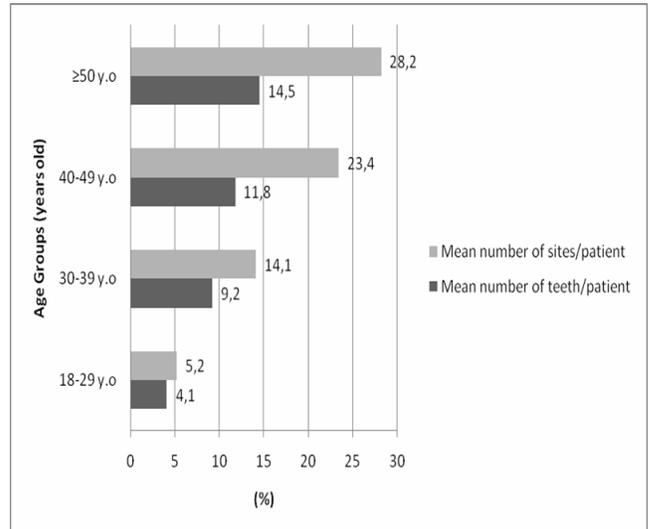


Figure 2. Extension of gingival recession according to the age group

to the older age range (≥ 50 years); however, the two younger groups (18-29 and 30-39 years old) showed percentages of gingival recessions as 15.6% and 32.6%, respectively (Figure 1).

The mean number of teeth and the mean number of sites with gingival recession increased with age (Figure 2). The maxillary and mandibular molars were the teeth most frequently affected by root surface exposure, even though the mandibular central and lateral incisors also commonly displayed gingival recessions (Figure 3).

Scoring of the gingival recessions at the buccal aspect according to Miller’s classification revealed that Class I recessions were the most prevalent, followed by Class III recessions (Figure 4).

Regarding the different age ranges, Class I reces-

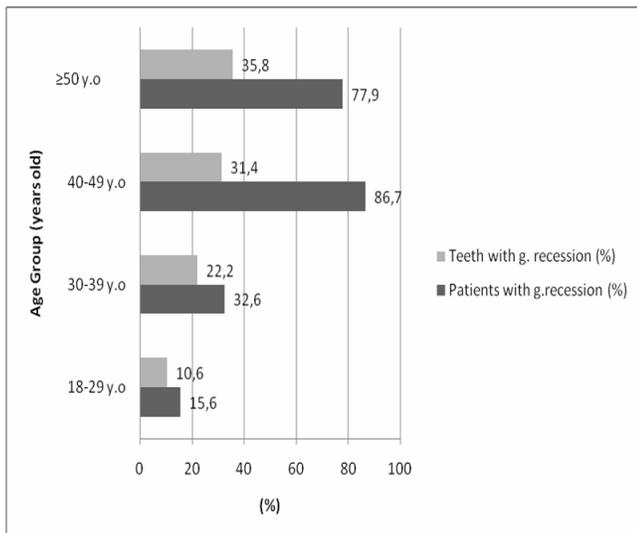


Figure 1. Prevalence of gingival recession according to the age group

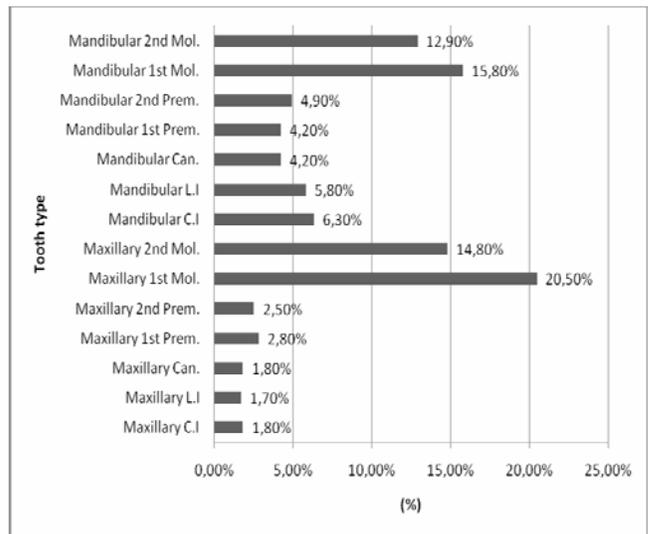


Figure 3. Distribution of gingival recession by tooth type.

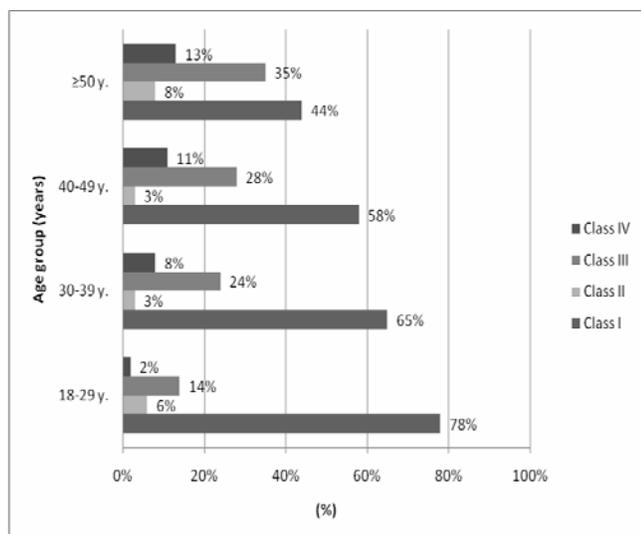


Figure 4. Scoring of the severity of gingival recession according to Muller's (1985) classification.

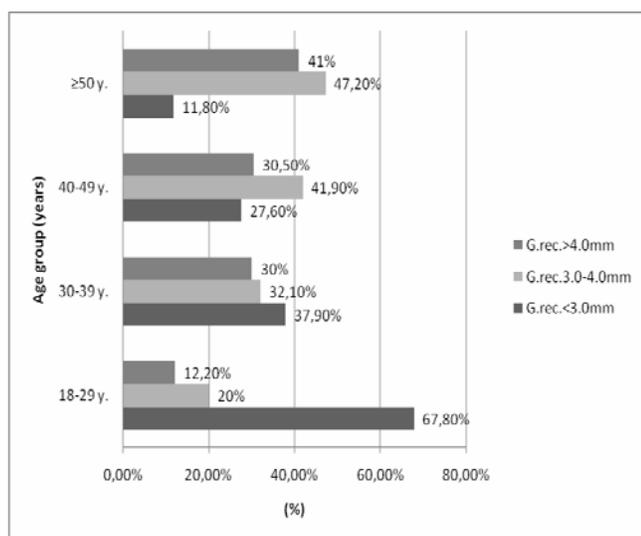


Figure 5. Severity of gingival recession according to age groups.

sions decreased as age increased, however, Class IV recessions, considered as the most severe condition according to Miller's classification, showed an increasing occurrence with the increase in age (Figure 4).

Regarding the apico-coronal length of the gingival recessions observed in different age ranges, the vertical width of the root surfaces exposed increased as older patients were assessed (Figure 5).

Discussion

According to the results of the present study, the prevalence of the gingival recession was overall 53.5%; however, several studies have shown different findings. The majority of studies on gingival recession have shown that the frequency of gingival recession ranged from 50.0% to higher percentages.^{2,4,16-19} Only

in two studies the frequency of gingival recession ranged from 22.5% to 27.7%.^{20,21} The observed differences could be attributed to heterogeneous samples regarding the group age, the composite of the samples, the fact that some results of the studies were based on several diagnostic criteria, the examiners used different criteria, etc.

The frequency of gingival recession increased with the age. This finding is in agreement with results of the other studies, in several age groups. In the younger groups, 19-30 years old,²² 20-25 years old,²³ 50.0% and 29.9% of the subjects had gingival recession, respectively. In the middle-aged group, 46-55 years old,²¹ the gingival recession frequency has been showed to be the highest. In a study by Susin et al,¹⁷ the frequency of gingival recession in adults aged 20-50 was considered high. This finding is in agreement with the results of the study by Almeida et al,²⁴ and the study by Albandar & Kingman.²⁰ This relationship between the occurrence of gingival recession and age could be attributed to the longer period of exposure to the factors that cause gingival recession,¹⁸ and the cumulative effects of the lesion itself.²⁵ In the present study, in the younger group, 16.0% of the patients had gingival recession and comprised about 15.6% of all teeth evaluated in this age range. With regard to the patients aged more than 50 years old, almost 77.9% of them presented with gingival recession and comprised more than 68.0% of the teeth in this group.

Gingival recession in young patients is usually localized and seems to comprise isolated etiologic factors. In old patients, gingival recession appears with amore generalized distribution, which might indicate the associated and cumulative effect of several factors ranging from a previous periodontal disease to improper use of hard toothbrush.¹⁷

Several studies have shown that the buccal surface is the site most frequently affected by gingival recession,^{4,20,26} which is in agreement with the present study and could be attributed to improper tooth brushing habits. However, localized root surface exposures in the lingual and proximal aspects have been correlated to poor oral hygiene.²⁷

Studies that have been carried out in samples with a high level of oral hygiene showed that the majority of the recessions concerned the buccal surfaces mainly than the lingual and an increasing percentage of the recessio frequency were caused by the toothbrush method than the presence of dental plaque.^{18,25,27} Other studies have shown similar findings.^{2,4}

In the present study, the maxillary and mandibular first and second molars were the teeth most frequently affected by root surface exposure, followed by the

mandibular central and lateral incisors. Other studies have shown the highest frequency of teeth with recessions in the anterior teeth of the mandible,^{16,26-29} the premolars of the mandible,^{15,30} the first molars of the maxilla,²⁴ and the canines and the first premolars of the maxilla.^{30,31} Checchi et al.³² found that in the age group of 19-25 years old, canines of both jaws were the most frequently teeth affected by gingival recession. Muller et al.²² found that in the age group of 19-30 years old first and second molars of both jaws were the most frequently teeth affected by gingival recession; however, Murray¹⁹ showed that the most frequently affected teeth with gingival recession were mandibular incisors followed by first maxillary molars, first mandibular molars, premolars of both jaws, second maxillary molars, second mandibular molars and canines of the mandible. Maxillary incisors showed the lowest prevalence of gingival recession.¹⁹

The extension of root surface exposure defines the severity of gingival recessions.³³⁻³⁵ Miller suggested the classification of gingival recessions and the predictability of the treatment established in this area.⁸ The prognosis of Class I recessions is quite favorable. Class III and IV recessions, considered as the most severe with the worst prognosis, showed an increasingly larger prevalence in older patients in the present study.^{8,9} Only in one study found all recessions to be Miller Class I²⁴. The high prevalence of gingival recession in adult patients provides information to the dental professionals as to the importance of the diagnosis and knowledge on these clinical conditions.

The higher prevalence and severity observed in older patients suggest the cumulative effect of the lesion, associated to the longer period of exposure to the etiologic factors, which should be identified and removed as early as possible in order to reduce or even avoid worsening of the clinical condition.

Conclusions

Gingival recession was observed in 53.5% of the sample and 42.6% of the total number of teeth evaluated. The mean number of teeth with gingival recession and the mean number of sites with gingival recession increased with age. The most frequently teeth affected by root surface exposure were the maxillary and mandibular molars followed by the mandibular central and lateral incisors. Class I recessions according to Miller's classification were the most prevalent followed by Class III recessions.

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