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Ten-year longitudinal study of gingival recession in dentists

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Abstract

Aim: To assess the prevalence and progression/regression of gingival recession in a population sample with a high standard of oral hygiene and broad knowledge of the role of traumatic tooth brushing in the aetiology of gingival recession.

Material & Methods: Forty dental students in their final year at Dental School were examined for gingival recession in 1994 and 10 years later by the same examiner. Tooth brushing habits were ascertained in a questionnaire. Clinical parameters recorded for each recession were: recession height, probing depth, width of keratinized gingiva and bleeding on probing. Full-mouth plaque index was recorded using the modified Quigley & Hein index.

Results: The prevalence of gingival recession was 85% and did not change after 10 years. A total of 210 recessions found at the initial examination and 299 at the second were valid for longitudinal evaluation. Statistical differences between recessions at both examinations were found in several clinical parameters. Subjects had a significant increase in the plaque index at the second examination despite very few changes in their oral hygiene habits ($p < 0.0001$).

Conclusions: In dentists, after 10 years, mean number of gingival recession per person and mean recession height increased while plaque control decreased.

Key words: gingival recession; longitudinal study; oral hygiene; prevalence; progression/regression; tooth brushing

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Adults with a good standard of oral hygiene usually present a high prevalence of gingival recession associated with tooth brushing (Löe et al. 1992, Serino et al. 1994). Toothbrush trauma is considered the most common precipitating factor in the initiation and progression of non-inflammatory, localized gingival recession, and is associated with several variables found to be erroneous and traumatic: tooth brushing frequency (Vehkalahti 1989), use of hard bristle brushes (Khocht et al. 1993) and brushing technique (Checchi et al. 1999). At present, most studies on this topic are cross-sectional or short-term, and recently, the data supporting or refuting the association between tooth brushing and gingival recession have been described as inconclusive (Rajapakse et al. 2007). Moreover, long-term studies do not document the development of recession (Litonjua et al. 2003), and there is limited evidence about the development of gingival recession when tooth brushing trauma decreases (Daprile et al. 2007).

The other main risk factor for gingival recession is progressive plaque accumulation, which can induce periodontal destruction. This normally causes initial attachment loss as periodontal pockets, but can also appear as initial gingival recession (Yoneyama et al. 1988, Heitz-Mayfield et al. 2003). In this context, another factor to take into account is the positive association between recession as a sign of initial periodontal disease and increasing age (Schätzle et al. 2003, Hugoson et al. 2008), which may have a significant influence on long-term observational studies. The aim of the present investigation was to assess the prevalence and progression/regression of gingival recession and several of its clinical parameters in a population sample with a high standard of oral hygiene and broad knowledge of the role of traumatic tooth brushing in the aetiology of gingival recession.

Conflict of interest and source of funding statement

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Material and Methods

Study sample

Forty dental students (16 women and 24 men) in their final year at the University of Barcelona Dental School were examined for gingival recession in 1994 and 10 years later by the same examiner. At the time of the second examination, the examiner was blinded to the results of the first examination. The initial examination was conducted at the Dental School, and included 60 dental students. This sample was considered representative of a dental student population attending their last year of Dentistry studies due to the fact that each subject was selected by alternate assignment and this was the sole criterion for inclusion. The total number of students in the class was approximately 100. For the second examination, we were able to contact 52 of the 60 subjects who participated in the first examination, and ultimately only 40 of those 52 were able to attend the second examination at a dental office in the city centre of Barcelona.

Questionnaire and clinical examination

A questionnaire and a clinical examination were administered at each appointment. The questionnaire collected information concerning age and gender, tooth brushing habits (brushing frequency, tooth brushing technique, toothbrush type, toothbrush bristle stiffness) and some factors related to the occurrence of gingival recession (smoking, orthodontic and periodontal treatments received). The clinical examination involved assessment of the number of teeth (third molars not included), the presence of gingival recession and some related clinical parameters, and a full-mouth plaque index. Implants and teeth exhibiting crowns or orthodontic bands in any of the two examinations were excluded from the periodontal evaluation. Gingival recession, recorded in millimetres, was assessed at buccal and lingual tooth surfaces, and was considered the location of the gingival margin apical to the cemento-enamel junction (CEJ) with exposure of the root surface. If the CEJ was not exposed or if the gingival margin was on the crown, no recession was recorded.

A manual periodontal probe graded at 3-6-8-11 mm (PCP-11 colour-coded probe; Hu-Friedy, Chicago, IL, USA) was used to assess the clinical parameters at both examinations. Teeth were divided into three buccal dental sites (mesial, mid-buccal, distal) and three lingual dental sites (mesial, mid-lingual, distal). The extent of recession was measured at the point on the tooth site where maximum recession had been scored. If the point of maximum height of recession was in a central site as well as in one or both of the inter-proximal sites, the central site was considered to be the point of maximum height. In cases where recession amounted to fractions of the first millimetre, recession of 1 mm was recorded. The rest of the measures were scored to the nearest whole millimetre. Probing depth was always measured at the point of maximum recession, as the distance between the gingival margin and the bottom of the clinical pocket. If the probe could not be introduced at least 1 mm in the sulcus, the probing depth was considered to be 0 mm. The width of keratinized gingiva, assessed only for the buccal recessions at the point of maximum recession, was measured as the distance between the mucogingival junction and the gingival margin. Bleeding on probing was recorded dichotomously and was deemed positive if it occurred a few seconds after the assessment of probing depth at the point of maximum recession. Finally, a full-mouth plaque index was recorded using the modified Quigley & Hein (Q–H) score at six surfaces per tooth. All scores were recorded on a periodontal chart.

All examinations throughout the study were performed by the same examiner, who was trained and calibrated for the diagnosis and measurement of the clinical parameters of gingival recession and the assessment of plaque index before both examinations. Professional oral procedures were not performed before the exams. The study was conducted in full accordance with the applicable ethical principles and independently reviewed by a Committee of the University of Barcelona Dental School. Subjects participating in the study provided informed consent.

All data recorded in the clinical examination were restructured to optimize the percentage and statistical analysis of results. The same data processing was carried out in both examinations, and included clinical parameters compiled per subject and per gingival recession.

Statistical analysis

The statistical analysis of the data was carried out with the statistics package SPSS-PC version 11.5.1 (SPSS Inc., Chicago, IL, USA). Qualitative variables were described by absolute frequency and percentage for each value, while quantitative variables were described by the minimum and maximum value and the calculation of the mean and standard deviation. For qualitative variables the Chi-squared test was used, with Fisher's exact test used in the case of low frequencies. Student's *t*-test was used to compare means between groups when the variables were quantitative. Comparisons of two groups in a paired design for qualitative variables were performed using the Mac-Nemar test. Student's *t*-test was used for comparison of two means with paired data. To assess the existence of a relationship between the values of the different variables studied in the two periods of observation, the Pearson correlation coefficients were calculated. A multiple regression analysis was employed on a tooth level.

The significance level was set at 0.05 for all comparisons.

Results

Study sample

Sixty individuals were assessed in the first examination, and 40 of these were examined again in the second. To verify whether or not the 40 individuals included at the second assessment differed in some aspect from the 20 not reviewed at the time of initial examination, we made comparisons of all variables from the questionnaire and clinical parameters compiled per subject. No statistically significant differences were found between the two groups, so we can say that at the time of the first examination, the sample of 20 indi-

viduals who were not later reassessed had the same characteristics as the reassessed sample of 40 individuals.

Questionnaire

The mean age of the 40 dental students was 23.48 years; 10 years later, as dentists, their mean age was 33.95 years. Of these dental students 100% brushed their teeth at least once a day and 87.5% more than once a day. The frequency of brushing remained virtually unchanged 10 years later: 100% of the dentists brushed at least once a day and 92.5% more than once a day. 42.5% of students performed the Bass brushing technique or its modified version, 27.5% rotational brushing and 22.5% vertical brushing. There were few changes in brushing technique 10 years later, and usage rates of each remained nearly unchanged. In the initial examination 7.5% of students regularly used a powered toothbrush; 10 years later that percentage increased significantly to 25% of the dentists ($p = 0.039$). The vast majority of students (92.5%) and dentists 10 years later (97.5%) used brush bristles of soft or medium hardness.

In 1994, 80% of students did not smoke, and 10 years later neither did 85% of dentists. Among dental students, 22.5% had undergone previous orthodontic treatment and 12.5% had orthodontic appliances at the time of examination I. Ten years later only one dentist, out of the 26 who had never been treated, had undergone orthodontic treatment. In the first review, six students (15%) had received periodontal treatment of some kind: one student had received gingival grafting, three received an occasional scaling session, and two were following a periodontal maintenance programme. There was no observed increase in individuals who received periodontal treatment after 10 years.

Clinical examination

At the first examination, the 40 students comprising the sample had a total of 1100 teeth in their mouths, which represented 98.2% of the full dentition, excluding third molars. Only one individual lost a tooth in the following 10 years. 99% of the teeth present in the mouth were valid for evaluation in both examinations. There was a significant increase in the mean plaque index in the second examination, from 0.93 to 2.12 ($p < 0.0001$). 85% of students had at least one tooth with gingival recession. Ten years later, the prevalence in dentists had not changed. In contrast, the mean number of teeth per person with gingival recession in the initial examination was 5.10 (SD: 5.57), and that number increased to 6.55 (SD: 6.37) in the second examination ($p = 0.048$). There was a significant relationship between the values ($p < 0.0001$). Of the 40 subjects (Table 1), four (subjects 3, 21, 32 and 37) did not present any teeth with recession in either examination. In contrast two subjects had 26 teeth (subject 12) and 23 teeth (subject 15) with recession at the first examination in 1994. Ten years later, subject 12 had 28 teeth with gingival recession and subject 15 had only 20 due to the fact that in the second examination five teeth exhibited crowns and those were excluded from the periodontal and longitudinal evaluation.

A total of 210 recessions at the initial examination and 299 at the second were valid for the longitudinal evaluation of the clinical parameters recorded. The distribution of buccal and lingual recessions within the dentition at both examinations is shown in Fig. 1. At the first examination the highest prevalence of buccal recessions was found in the canines and at the second examination the highest prevalence of recessions was located in the molars ($p < 0.0001$). There was a significant increase in the percentage of lingual recession, from 10.5% at the first examination to 19.1% at the second examination ($p = 0.008$). The point of maximum recession was located at the central site in 85.6% of all recessions at the first examination and in 86% at the second.

The mean recession height was 1.59 mm for the diagnosed recession in examination I and 1.83 mm in examination II ($p = 0.004$). The difference between the means was 0.24 mm. The mean probing depth of recessions at the first examination was 0.97 mm, while the mean probing depth of recessions at the second examination was 1.48 mm ($p < 0.0001$). There were no differences in mean keratinized gingiva of buccal recessions between the values in the two periods of observation. Statistical differences were found between the means of the modified Q–H plaque index of the three dental surfaces (mesial, central, distal) of the tooth face with recession in the two periods of observation ($p < 0.0001$) (Table 2). Bleeding on probing was more prevalent in the recessions at the second examination ($p < 0.0001$). In examination I, only 5 of the 210 recessions bled on probing while 10 years later bleeding on probing was observed in 58 of 299.

Longitudinal evaluation of the extent of gingival recession was based on a threshold value of ≥ 2 mm. Table 3 shows the distribution within the dentition of buccal and lingual recessions equal to or greater than 2 mm height at examination II expanded to two categories: (1) appearing recessions (the ones that were not found in the first examination and were ≥ 2 mm height in the second), (2) persisting recessions (the ones that were already present in the first examination and being of ≥ 2 mm recession height in the second). Molars presented a higher number of buccal and lingual appearing recessions of ≥ 2 mm height at examination II, while canines presented a higher number of buccal persisting recessions after 10 years. To evaluate the relationship between the development of the extent of buccal recessions and the rest of the clinical parameters recorded for each recession, a multiple regression analysis on a tooth level was performed based on the data from the second examination and with the recession height as dependent variable (Table 4). By including probing depth, keratinized gingiva, bleeding on probing and the modified Q–H plaque index of buccal recessions as explanatory variables, 21% of the variance of the dependent variable (recession height) could be explained. The calculated regression coefficients and *p*-values for the explanatory variables indicated that probing depth is associated with buccal recession height while keratinized gingiva is negatively associated with the development of buccal recession height. Bleeding on probing and the modified Q–H plaque index of the

Table 1. Comprehensive subject data ($n = 40$)

Subject	Gender	Age (1)	Number of teeth with recession (1)	Number of teeth with recession (2)	Number of recessions (1)	Number of recessions (2)	Full-mouth plaque index (1)	Full-mouth plaque index (2)
1	M	22	3	4	3	2	0.81	2.01
2	M	22	2	0	2	0	0.92	1.97
3	M	25	0	0	0	0	0.89	2.63
4	M	22	7	11	7	13	0.90	2.26
5	F	23	13	9	14	9	1.48	2.51
6	M	22	3	1	3	1	0.94	1.61
7	M	24	9	8	9	9	0.58	1.38
8	M	22	10	4	11	4	0.61	1.80
9	M	33	6	10	6	16	1.38	2.55
10	M	22	7	12	7	18	0.55	1.81
11	M	22	3	0	3	0	1.21	0.47
12	M	34	26	28	31	41	1.39	1.95
13	M	23	4	4	4	4	1.05	1.37
14	M	26	1	10	1	10	1.24	1.62
15	M	32	23	20	22	29	0.54	2.30
16	F	22	6	3	6	3	1.21	2.26
17	F	22	4	6	4	6	1.16	2.14
18	M	22	4	3	4	2	0.64	2.71
19	M	22	4	16	4	17	0.25	1.70
20	M	23	0	1	0	1	1.24	2.94
21	M	22	0	0	0	0	1.16	2.77
22	M	22	3	1	3	1	0.95	2.55
23	M	22	3	15	3	12	0.80	2.63
24	F	22	2	2	2	2	1.04	3.04
25	F	22	1	3	1	3	0.37	2.40
26	M	22	6	3	6	3	1.05	2.66
27	M	23	1	11	1	11	1.76	3.18
28	M	22	7	6	7	6	0.27	2.00
29	F	22	5	6	5	6	0.85	2.55
30	F	23	11	14	11	15	1.18	2.45
31	F	22	5	17	5	20	1.16	3.19
32	F	22	0	0	0	0	0.52	1.15
33	F	22	1	2	0	2	0.98	0.99
34	F	22	5	2	5	2	0.33	1.43
35	F	22	0	3	0	3	0.64	1.73
36	F	26	2	9	2	9	1.34	1.32
37	F	22	0	0	0	0	0.89	2.35
38	F	22	2	3	2	3	0.18	1.98
39	M	30	6	8	6	9	1.64	1.93
40	F	22	9	7	10	7	1.15	2.43
	24/16	23.48 (3.17)	5.10 (5.57)	6.55 (6.37)	210	299	0.93 (0.39)	2.12 (0.62)

M, male; F, female.

buccal recessions were not significant in the development of buccal recession height.

Discussion

In the literature there are few longitudinal studies of gingival recession, and some of these evaluate only certain teeth and tooth sites in the mouth, covering individuals from a very wide age range and with different examiners participating throughout the study (Ship et al. 1996, Albandar & Kingman 1999). Others evaluate the presence of gingival recession only on the buccal aspect of the tooth (Serino et al. 1994) or do not record the width of keratinized gingiva (Löe et al. 1992).

The present study evaluates the presence of gingival recession in all the teeth in the mouth, on both buccal and lingual tooth surfaces, and in a population with a limited age range. The same examiner performed all measurements in the two tests, and for each case the evolution of recession and clinical parameters that characterized it were examined. For an epidemiological study on a specific population, it is necessary to fully describe the features that distinguish this group (Kingman & Albandar 2002). Description of the population was conducted through a questionnaire on oral hygiene habits, and a full-mouth Q–H plaque index, Turesky modification (Turesky et al. 1970). Several studies linking the prevalence of gingival recession with the trauma of brushing do not contrast the level of oral hygiene of individuals with a plaque index of the entire mouth (Björn et al. 1981, Ainamo et al. 1986, Vehkalahti 1989, Khocht et al. 1993).

Questionnaire

The fifth-year dental students in the 1989–1994 promotion taken as a sample ranged in age between 22

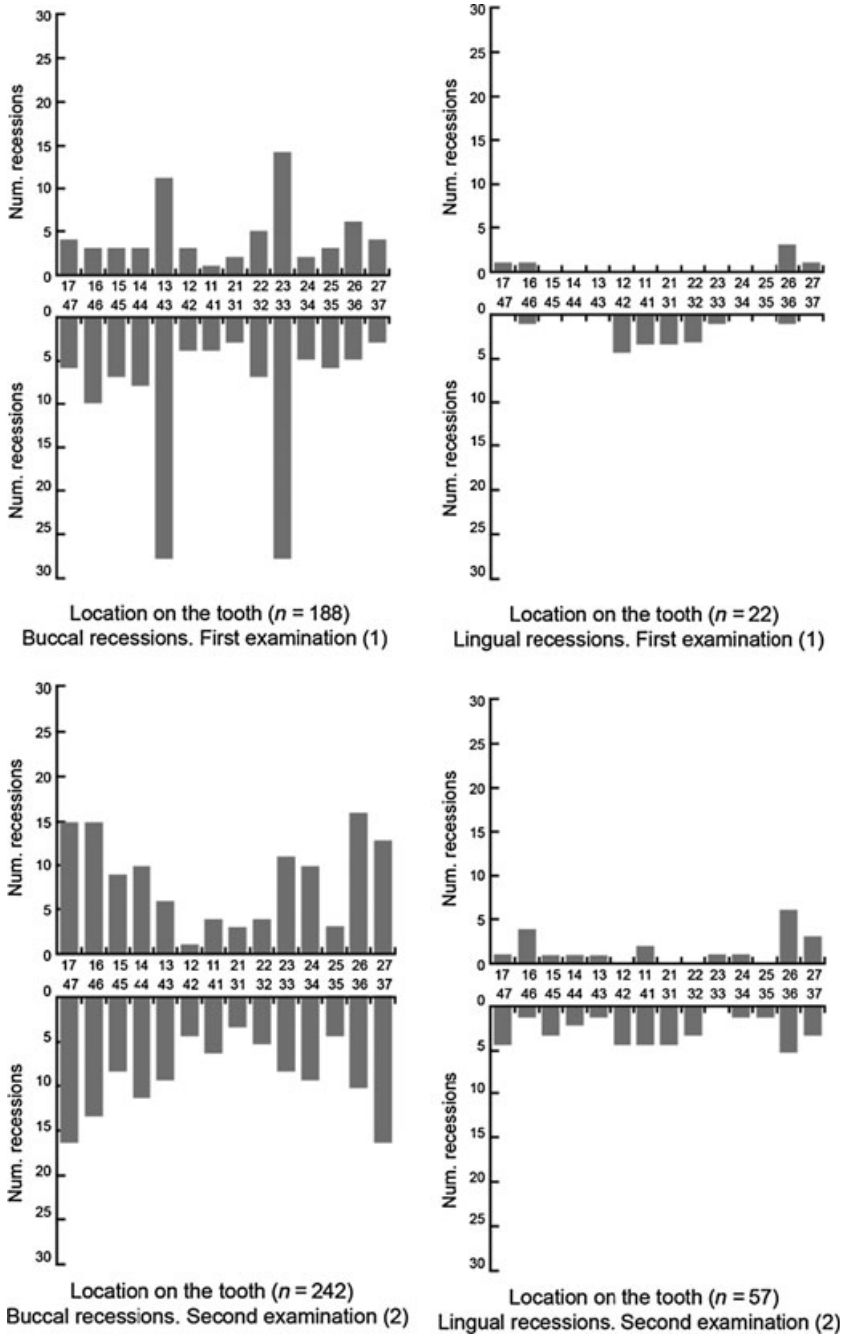

Fig. 1. Distribution within the dentition of the buccal and lingual recessions at the first examination (n = 210) and at the second examination (n = 299).

and 34 years, with a mean of 23.48 years. The age range was relatively large because in that class there were some recently graduated medical students who joined in the third year of dentistry. At the second examination the dentists were between 31 and 45 years old, with a mean age of 33.95 years.

The results obtained through the questionnaire in the first examination suggest that the students from the fifth year of dental school had a higher level of brushing frequency than individuals from studies in non-specific populations (Vehkalahti 1989, Murtomaa & Metsäniitty 1994). The frequency of brushing remained virtually unchanged after 10 years. The longitudinal study on gingival recession of Löe et al. (1992) also did not see major changes in oral hygiene practices over a period of years. An important difference between the study sample and the general population is in the brushing technique employed. Most individuals in a general population use a simple brushing technique based on horizontal brushing movements (Sanz & Echeverría 2002), whereas in the present study in the first examination only 1 of 40 individuals reported performing a horizontal brushing technique, and none did so in the second. There was a clear tendency to incorporate the powered toothbrush as a primary tool for oral hygiene. This is an important fact, considering that the study sample comprises dentists and this was the only statistically significant change in oral hygiene habits of this population in 10 years. Hard brushes are rarely used by a population that knows the effects of gingival abrasion caused by frequent use of a hard bristle brush (Daprile et al. 2007).

Clinical examination

The amount of accumulated plaque and the presence of gingival recession were determined for a total of 6510 tooth surfaces in examination I and for 6516 surfaces in examination II. The 40 students demonstrated a mean plaque index of 0.93 for Q–H (Turesky modification); therefore we can say that participants in this study, as students, had a very low rate of accumulation of plaque and a high level of oral hygiene. Two relevant longitudinal epidemiological studies that reference gingival recession in populations with a high level of oral hygiene relate the low level of plaque accumulation to the trauma of brushing and a high prevalence of buccal gingival recession (Löe et al. 1992, Serino et al. 1994). After 10 years the mean plaque index in our student group increased to 2.12. This considerable and significant increase in the plaque index at the second examination ($p < 0.0001$) is not easily explained, since oral hygiene habits based on questionnaire responses hardly changed from one examination to the next. One possibility would be that the removal of plaque is influenced by other factors that are not asked in the questionnaire, such as time spent during each brushing, pressure, the time that had elapsed since the

Table 2. Comparison of quantitative variables of recession between the recessions at the first examination (210) and at the second examination (299)

	n	Mean (SD), mm	Mean difference (mm)	*t*-Test	*p*-value
Recession height	210	1.59 (0.76)	0.24	2.86	0.004
	299	1.83 (1.04)			
Probing depth	210	0.97 (0.67)	0.51	6.43	<0.0001
	299	1.48 (1.01)			
Keratinized gingiva	188	3.66 (1.26)	−0.18	−1.35	NS
(buccal recessions)	242	3.48 (1.39)			
Q–H recession	210	0.87 (0.94)	1.69	15.39	<0.0001
	299	2.56 (1.38)			

NS, non-significant; Q–H recession, mean of the modified Quigley–Hein plaque index of the three dental surfaces (mesial, central, distal) of the tooth face with recession.

last professional oral hygiene procedure, or flossing use.

Eighty-five percent of students had at least one tooth with gingival recession. Studies of fifth-year dental students in other countries have shown a similar rate of 82.6% in Italy (Daprile et al. 2007) and a lower rate of 67.5% in Chile (Wilckens et al. 2003). Ten years later, the proportion of dentists having at least one tooth with gingival recession had not changed. This result was similar to that of other populations with the same age range and a good standard of oral hygiene who experienced an increase in the prevalence of gingival recession with age (Löe et al. 1992). In fact, the stage of life in which the highest incidence of gingival recession is observed is between 20 and 40 years of age (Serino et al. 1994). In our study, the dental students had a mean of 5.10 teeth with recession, and 10 years later, when they were dentists, they had a mean of 6.55 teeth with recession. This increase was statistically significant ($p = 0.048$), although it cannot be considered a great increase. This is partly explained by the following circumstances: (1) lingual or palatal recessions appearing in the second examination on teeth in which buccal recession already existed does not increase the number of teeth with recession and (2) in the present study an unusual phenomenon was observed at examination II, which was the disappearance of a significant number of gingival recessions diagnosed at examination I.

Table 3. Distribution within the dentition of appearing and persisting buccal and lingual recessions ≥ 2 mm at examination 2

Tooth	Appearing ≥ 2 mm		Persisting ≥ 2 mm	
	Buccal	Lingual	Buccal	Lingual
11	0	1	1	0
12	0	0	0	0
13	0	1	2	0
14	1	1	1	0
15	1	1	2	0
16	6	1	2	0
17	6	0	3	1
21	2	0	0	0
22	2	0	0	0
23	0	1	4	0
24	1	1	2	0
25	0	0	1	0
26	5	2	4	1
27	4	2	3	0
31	0	0	3	1
32	1	0	1	2
33	0	0	6	0
34	3	1	1	0
35	0	1	2	0
36	6	2	1	1
37	6	1	2	0
41	0	1	1	2
42	1	1	2	2
43	1	1	6	0
44	1	0	2	0
45	1	2	2	0
46	2	0	3	1
47	4	3	2	0
Total	54	24	59	11

It is well known that it is sometimes hard to ascertain the exact location of the CEJ, and current methods of measurement of gingival recession may be too insensitive to permit valid sequential comparisons to be made over reasonable periods of time. Also unfortunately, there is often no suitable alternative to the CEJ for gingival recession measurements (Smith 1997). In this study some of the spontaneous healing of gingival recession may be due to measurement/diagnosis errors, especially in the case of small amounts of gingival recession. Since the purpose of this investigation was to study the prevalence of gingival recession in a population sample of dental students in their final year at Dental School and since all participants were quite young at baseline, it was expected that most recessions, if present, would be minimal.

At the first examination, the canines presented more buccal recessions (Fig. 1). The very high percentage of recovery in the canines could be due to two anatomical abnormalities that may lead to a diagnostic error. First, it is possible to confuse the perikymata, an external manifestation of the Retzius stria, with the CEJ. The most common observation site of this entity is the cervical part of the buccal faces, and the canines are the most noticeable teeth, especially the lower ones (Figun & Garino 1988). Second, pseudo gingival recession is a more apically positioned gingival margin of a tooth when compared with the gingival margin of an adjacent tooth without exposure of the root surface (Stoner & Mazdyasna 1980). This difference in clinical crown is often observed between the canines and lower incisors. 10 years later, the same examiner should not have judged both clinical situations as gingival recession, and therefore these cases simulated recovery of recession up to 3 mm.

The mean recession height of recessions at examination I was 1.59 mm and increased to 1.83 mm at examination II ($p = 0.004$). The

Table 4. Multiple regression analysis with buccal recession height at examination 2 as dependent variable ($n = 242$)

Regression model	*F*-value: 15.32	*p*-value: <0.0005	R^2: 0.21
Variable	Estimate	SE of estimate	*p*-value
Intercept	2.81	0.35	<0.0005
Probing depth	0.29	0.07	<0.0005
Keratinized gingiva	−0.24	0.04	<0.0005
Bleeding on probing	−0.27	0.15	0.06
Q-H recession	−0.05	0.05	0.33

increase in the extent of recession with age is a widespread phenomenon observed in all cross-sectional and longitudinal epidemiological studies and in all ages (Serino et al. 1994, Ship et al. 1996). Reliability of measurements is an important problem in detecting changes in recession extent. There is always a possibility of measurement error, because slow and continuous recession development is transformed into an ordinally scaled parameter (recession in increments of 1 mm). Furthermore, bias caused by regression towards the mean may be present (Müller et al. 2002).

In the present study longitudinal evaluation of the extent of gingival recession was based on a threshold value of ≥ 2 mm to reduce the presence of diagnosis and measurement errors. A total of 148 of 299 recessions found at the second examination were of ≥ 2 mm extent. Of these recessions 47% were already present at the first examination, while 53% appeared during the following 10 years. Molars showed a higher number of buccal and lingual appearing recessions of $\geq$ 2 mm height at examination II, while canines showed a higher number of persisting buccal recessions after 10 years. This development in the location of recession contrasts with the observations of a 12-year longitudinal study in which a group of individuals 18–29 years old experienced a significant increase in the number of recessions located in the incisors and canines throughout this period (Serino et al. 1994).

The result of the multiple regression analysis performed on a tooth level using the buccal recession height in the second examination as dependent variable revealed a low coefficient of determination (21%) of the clinical parameters recorded for each recession: probing depth, keratinized gingiva, bleeding on probing and Q–H plaque index. In conclusion, the reliability in the diagnosis and the accuracy in the measurements are the most determinant factors to consider in the assessment of the prevalence and progression/regression of buccal recessions.

Conclusions

The prevalence and clinical parameters of gingival recession in dentists showed different patterns in the two examinations. The first pattern was most likely related to a high standard of oral hygiene and the second to a significant increase in plaque accumulation.

Some recessions can recover with time or may be susceptible to a diagnostic error.

In dentists, after 10 years, mean number of gingival recession per person and mean recession height increased whereas plaque control decreased.

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Clinical Relevance

Scientific rationale for study: To observe the progression/regression of gingival recession in a population sample with a high standard of oral hygiene and broad knowledge of the role of traumatic tooth brushing in the aetiology of gingival recession.

Principal findings: Some recessions can recover with time or may be susceptible to a diagnostic error. In dentists, after 10 years, mean number of gingival recession per person and mean recession height increased whereas plaque control decreased.

Practical implications: Clinicians must accurately register and measure gingival recession to be able to diagnose its progression/regression over time.