Buccal attachment loss in Swedish adolescents

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Abstract. A case referent study was performed to identify factors connected with loss of buccal attachment in adolescents. The study group was identified among 18-year-olds who had participated 2 years earlier in a study of periodontal conditions in adolescents. The criterion for inclusion in the case group was buccal attachment loss (≥ 1 mm) in one or more sites. Information on 28 variables, identified earlier as being related to recessions, was collected in a clinical examination, interview and observation. The referent group consisted of 66 subjects and the case group of 71 subjects. The case group comprised 2 subgroups, one identified as having buccal attachment loss in 1987 and the other with attachment loss occurring in the years 1987–89. Statistical analyses, using the χ^2 test, logistic regression and a variance component model, were performed to detect factors related to buccal attachment loss. These factors were thin alveolar tissue, narrow width of the attached gingiva and presence of teeth with buccal displacement. The results indicate that the anatomy of the buccal alveolar process is related to the presence of buccal attachment loss in populations with a high level of oral hygiene. To evaluate the importance of possible risk factors or etiological factors for development of buccal loss of tooth support, prospective epidemiological or experimental studies are needed.

Key words: epidemiology; oral; periodontitis; gingival recession.

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When the attachment of a tooth is lost to the extent that the root is exposed, or the coronal edge of the marginal gingiva is located apical to the cemento-enamel junction, the condition is commonly referred to as gingival recession (Gorman 1967, Paterson 1979). Gingival recessions, often found on the buccal surfaces of teeth, tend to be an esthetic problem (Paterson 1979). They are also considered to be a clinical problem on account of the suggested associations between recession and both dentin hypersensitivity (Dowell & Addy 1983, Watson 1984, Addy et al. 1987) and root caries (Raetzke & Rockel 1986).

In adolescents, the reported prevalence of gingival recession varies between 10% and 74% (Gorman 1967, O'Leary et al. 1971, Björn et al. 1981, Mierau & Fiebig 1986, Ainamo et al. 1986, Paloheimo et al. 1987, Miller et al. 1987, Frentzen et al. 1989). High figures have been reported in some Scandinavian studies: 62% for 15-year-olds from Malmö, Sweden (Björn et al. 1981) and 74% for 17-year-olds from Espoo, Finland (Ainamo et al. 1986). It has been shown that the prevalence of recession increases with age (Woofter 1969); other variations in the reported prevalences probably have to do with the use of different criteria for the identification of gingival recession.

Several etiological factors behind gingival recession have been discussed in the literature (for reviews, see Woofter (1969), Paterson (1979), Watson (1984)). However, studies of associations between recession and extrinsic or intrinsic factors have concentrated on three aspects: toothbrushing habits (Sangnes & Gjermo 1976, Björn et al. 1981, Ainamo et al. 1986, Mierau & Fiebig 1986, Paloheimo et al. 1987, Frentzen et al. 1989), malposition of teeth (Gorman 1967, Modéer & Odenrick 1980) and anatomy of the gingiva and the underlying bone, i.e., the width of the attached or keratinized gingiva (Tenenbaum 1982, Schoo & Van der Velden 1985, Wennström 1987) and dehiscences of alveolar bone (Löst 1984). An association has also been found between the use of smokeless tobacco and gingival recession (Offenbacher & Weathers 1985). The relative importance of all these factors for recession does not seem to have been studied.

The term buccal attachment loss is basically synonymous with recession, but in contrast to recession, it does not necessarily include an exposed root surface, but can also be present when the gingival margin is situated at or slightly above the cemento-enamel junction. The etiological factors of buccal attachment loss in adolescents should, however, largely be the same as those causing recession. The aim of the present investigation was to study the association between buccal attachment loss and various factors, earlier suggested as etiological for gingival recession.

Material and Methods

In 1987, a cross-sectional study was performed on periodontal conditions in 570 16- and 18-year-olds residing in the county of Västerbotten, Sweden (Källestål et al. 1990). Of the 287 16-year-olds, 65 (22.5%) had buccal attachment loss of ≥ 1 mm at 1 or more sites; of those, no one had proximal attachment loss. The identified subjects, together with another group of 130 adolescents randomly chosen among those with no attachment loss at the time of the cross-sectional study, were invited to participate on this occasion and all of them

received written information about the study.

Clinical examinations, interviews and observations of toothbrushing technique were performed during the spring of 1989 at the Public Dental Health Clinics in Lycksele and Vilhelmina municipalities or at the Department of Pedodontics, University of Umeå. All subjects were examined by one of the authors (CK) and the interviews and observations were performed by a trained dental assistant immediately after the clinical examinations. The analysis of dental casts and of records of previous or ongoing orthodontic treatment was performed by CK 2 months after the clinical examination.

Clinical examination

High frenum attachment. Recorded when a frenum was connected to the attached gingiva or the interdental papilla or when a frenum penetrated the papilla into the lingual gingiva (Mirko et al. 1974). The midline maxillary frenum was excluded in cases of high attachment; in all these cases it was situated exactly in the midline and accordingly did not interfere with the buccal attachment.

Presence of plaque. Recorded as visible/not visible after drying with air. Visible plaque corresponds to the criteria for plaque indices ≥ 2 according to Silness & Löe (1964).

Bleeding on probing. The tip of the periodontal probe (NIDR probe, #2–12, diameter 0.4 mm) was gently inserted into the gingival crevice until it reached the floor, whereupon it was immediately removed; bleeding/not bleeding was recorded after 30 s.

Calculus. Recorded as (1) supragingival only, (2) sub- and supragingival or only subgingival, after careful probing with an exploration probe (Maillefer #5).

Attachment level and width of the attached gingiva. The measurements were done with a periodontal probe with 2 mm color bands. They were made from the gingival margin to the base of the crevice, which represents the pocket depth, and from the gingival margin to the cemento-enamel junction (CEJ). A 3rd measurement was performed on the width of the keratinized gingiva, i.e., the distance between the gingival margin and the mucogingival line, recognized by the color difference between the keratinized gingiva and the alveolar mucosa. Each measurement was rounded down to the nearest whole mm. The attachment level was calculated by subtracting the distance gingival margin to CEJ from the distance gingival margin to crevice base. The width of the attached gingiva was calculated by subtracting the distance gingival margin to crevice base from the distance gingival margin to the mucogingival line. Buccal attachment loss was considered to be present if the attachment level was situated ≥ 1 mm from the CEJ.

Loss of attachment was determined at the mid-buccal (mesial root) surface of all teeth. Width of the keratinized gingiva was measured at the teeth 16, 21, 24, 36, 41 and 44 (Ramfjord 1959) and an average of these measures was computed for each subject. Bleeding on probing and presence of plaque were recorded at all buccal sites. Calculus was recorded at all teeth by careful probing in the buccal gingival crevice of the tooth; any calculus was removed before measuring attachment level. 3rd molars were not included.

Interview

The interview included standardized open-ended questions on: (a) brand of toothbrush and toothpaste, bristle hardness, frequency of brushings, if instruction in toothbrushing technique had been received; (b) use of smokeless tobacco, how often it was used and where in the mouth it was placed; (c) habits which may result in trauma to the gingiva.

Observation

The adolescents were asked to brush their teeth in their normal way and this was observed while the following parameters were registered; hand used for brushing, amount of toothpaste, where in the mouth the brushing began, type of toothbrushing technique, light or strong brushing force, time spent on brushing, toothbrushing performance.

Dental cast evaluation

At the clinical examination impressions were taken of the teeth and gums (Alginoplast, Bayer Dental, Leverkusen, Germany) and plaster casts were made. Type of occlusion was determined on the casts according to Angle, with additional subgroups for scissors- and crossbite. Buccal alignment of molars, premolars and canines was assessed. A tooth was considered buccally displaced when the sum of the linear displacements of the anatomic contact points was >2 mm; buccal displacement scored positive, lingual negative. The measurements were performed with a caliper with a 1 mm scale (Fig. 1). In addition, the width of the buccal alveolar tissue at molars and premolars was determined by measuring perpendicularly from the midline of the buccal surface of the tooth to the most prominent point of the buccal alveolar gingiva/mucosa at a point <4 mm apically of the gingival margin. The measurement was performed with a caliper with blades trimmed so as not to interfere with the cast (Fig. 2). Records of previous orthodontic diagnoses and orthodontic treatment were collected.

Statistical analyses

The design of the study allows comparisons between a case group with buccal attachment loss and a referent group without such loss. Furthermore, the earlier cross-sectional study (Källestål et al. 1990) revealed that the prevalence of buccal attachment loss was higher

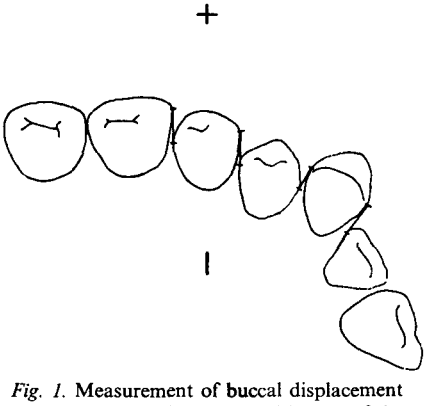

Fig. 1. Measurement of buccal displacement of teeth. A tooth is considered buccal of the arch when the sum of the linear displacements of the anatomic contact points is >2 mm; buccal displacement considered positive, lingual negative. Example: 2nd premolar: linear displacement between 2nd premolar and 1st molar, -2 mm, between 1st and 2nd premolars $+2$ mm; sum 0; thus, no buccal displacement is present. Canine: linear displacement between 1st premolar and canine $+1$ mm, between canine and 2nd incisor $+2$ mm; 3 mm; the canine is considered to be buccally displaced.

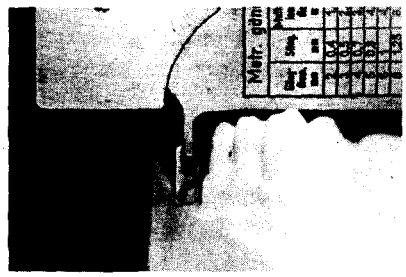

Fig. 2. Technique for measuring the width of the buccal alveolar tissue.

among the 18-year-olds than among the 16-year-olds. Thus, it could be expected that among the 16-year-olds without buccal attachment loss at that time, some individuals would have acquired such attachment loss in the two intervening years. It was therefore assumed that the case group could be subdivided into one group where buccal attachment loss was present in 1987 and another group where the loss was acquired in the years between 1987–89.

The analyses were performed in 3 steps. Firstly, the χ^2 test was applied to the hypothesis that no difference in the distribution of each variable existed between the referent group and either of the two case subgroups or between the referent group and the combined case group. This analysis was subject-based and variables collected on a site basis were transformed into subject variables. Variables defined with continuous scales (width of attached gingiva, width of buccal alveolar tissue) were categorized into 3 classes, based on the frequency distribution for the combined data. For width of attached gingiva the classes were: 0–3 mm, 3–4 mm, 4-mm and for the width of the buccal alveolar tissue: 0–0.5 mm, 0.5–1.0 mm, 1.0-mm. The design of the variables is given in Table 2. Differences at the 5% level of probability were considered statistically significant.

In order to reduce the number of variables in the subsequent analyses, variables identified in the χ^2 test as having an almost identical distribution in the referent and case groups were excluded (orthodontic treatment, orthodontic diagnosis, type of occlusion, toothbrushing force). Variables where the condition was present in only a few individuals (supra and subgingival calculus) were also excluded. In view of the limited number of subjects in some classes, the classes of the variables: number of brushings/day, bristle hardness, time spent on toothbrushing, amount of toothpaste and toothbrushing technique were reduced. The variables where toothbrushing began and oral location of smokeless tobacco were tested only in the χ^2 analysis.

Secondly, a logistic regression approach (Hosmer & Lemeshow 1989) was used to decide whether single variables or combinations of variables could classify a subject to the case or the referent group, i.e., presence or absence of buccal attachment loss. Each case subgroup and the combined case group were compared with the referent group. The case groups were also compared with each other. As in the χ^2 test, variables collected on site basis were transformed into subject variables (Table 2).

In a 3rd step, a variance components model (Sterne et al. 1988, Sterne et al. 1990) was applied to the individuals with buccal attachment loss. In this model, site measurements of buccal attachment level (continuous variable) were related to both site- and subject-based explanatory variables. The model allows for components of variation both between and within subjects and does not assume independence between sites in the same mouth. For practical reasons, site recordings of width of alveolar tissue were restricted to premolar and molar areas. The analysis accordingly included the 16 buccal sites of these teeth. For details on variable design, see Table 2.

Results

Of the 195 18-year-olds invited, 137 (70%) agreed to participate. Fifteen rejected the invitation, 33 had moved from the area and 10 did not show up at the examination. Of the 137 adolescents examined, 66 (48%) did not have any buccal attachment loss, while 71 (52%) had attachment loss at one or more buccal sites. Of the latter, 41 had had buccal attachment loss at the 1987 examination (case subgroup I), while 30 had not (case subgroup II). The distribution of adolescents in the various groups is given in Table 1.

Table 1. Buccal attachment levels in cases and referents

Buccal attachment level* (mm)	Referent group	Case subgroup I	Case subgroup II
0	66	0	0
1	0	21	22
2	0	11	8
3	0	7	0
4	0	2	0
total	66	41	30

Case subgroup I identified with buccal attachment loss in 1987, subgroup II acquired buccal attachment loss 1987–89.
* Highest value per individual.

Extent, severity and distribution of buccal attachment loss

In the total group of subjects with buccal attachment loss (n = 71), an average of 4.4 sites were affected. In subgroup I the average number was 5.6 and in subgroup II it was 2.7.

At most sites, an attachment level of 1 mm was found. In 20 (49%) of the subjects in subgroup I and in 8 (27%) of those in subgroup II, the attachment level was $\geqslant 2$ mm at one or more sites (Table 1). The intraoral distribution of sites in the combined case group is shown in Fig. 3.

Of the adolescents in subgroup I, 31 (76%) showed a higher number of sites with buccal attachment loss in 1989 than in 1987 and 16 (36%) showed progression ($\geqslant 1$ mm) of one or more sites during this period.

χ^2 analysis

A statistically significant difference in distribution between subgroup I and the referent group was found for width of the buccal alveolar tissue ($p < 0.05$) and width of the buccal attached gingiva ($p < 0.05$). More subjects in subgroup I tended to have a thinner buccal alveolar tissue and less attached gingiva than the subjects in the referent group. For buccal displacement of one or more teeth there was a tendency towards a difference between the combined case group and the referent group ($p = 0.096$) (Table 3), the former subjects being more prone to have buccally displaced teeth. The rest of the variables tested did not show any significant differences between case and referent groups.

Logistic regression analysis

Only minor differences were found between the two case subgroups. The width of the attached gingiva predicted buccal attachment loss for each subgroup as well as for the combined case group, using a 5% probability of inclusion. When the probability of inclusion was extended to 10%, the width

Table 2. Definitions of variables used in the statistical analyses

Variables	Analyses		
	χ^2	Log. reg.	Variance comp.
sex	1/0	1/0	1/0
buccal attachment loss	1/0*	1/0*	si, c
bleeding	1/0*	1/0*	si, 1/0
plaque	1/0*	1/0*	si, 1/0
supragingival calculus	1/0*	1/0*	–
subgingival calculus	1/0*	1/0*	–
type of toothpaste	10 brands	10 brands	10 brands
type of toothbrush	13 brands	13 brands	13 brands
bristle hardness	ha/me/so	ha+me/so	ha+me/so
brushings/day	1/2/⩾3	1/⩾2	1/⩾2
instruction in toothbrushing	1/0	1/0	1/0
hand used	1/0	1/0	1/0
time spent on toothbrushing	1/2/3/4	1–3/4	1–3/4
amount of toothpaste	1/2/3/4	1/2/⩾3	1/2/⩾3
where toothbrushing begins	1–10	–	–
toothbrushing technique	1/2/3/4	1/2/3	1/2/3
toothbrushing performance	1/0	1/0	1/0
toothbrushing force	1/0	–	–
flossing	1/0	1/0	1/0
habits	1/0	1/0	1/0
smokeless tobacco (SLT)	1/0	1/0	1/0
intraoral location of SLT	3 places	–	–
orthodontic treatment	1/0	–	–
orthodontic diagnosis	1–9	–	–
type of occlusion	1–9	–	–
width of alveolar tissue	h/m/l	c	si, c
width of attached gingiva	h/m/l	c	c
high frenum attachment	1/0*	1/0*	1/0*
buccal displacement of tooth	1/0*	1/0*	si, 1/0

si: confined to 16 different sites; 1/0: dichotomic variable or transformed to a dichotomic variable; h, m, l: transformation to high, medium or low; c: continuous; bristle hardness: ha: hard, me: medium, so: soft; time spent on toothbrushing: 1: 0′–0.5′, 2: 0.5′–1′, 3: 1′–2′, 4: > 2′; amount of toothpaste: 1 < 1 cm, 2: 1–2 cm, 3: 2–3 cm, 4: > 3 cm; toothbrushing technique: 1: vibratory, 2: horisontal, 3: roll, 4: unspecific; toothbrushing performance: systematic/unsystematic; force used when brushing: light/hard.
* Attributed to the subject if found in ⩾1 site/subject.

of buccal alveolar tissue increased the ability of the attached gingiva to classify the subjects to case or referent group (Table 3).

Variance components analysis

The number of sites with buccal attachment loss was so low in relation to the total number of sites in subgroup II that the analysis was restricted to subgroup I. Using the approximate test that an explanatory variable has an effect if its coefficient was at least twice its standard error, the width of buccal alveolar tissue was found to be the only site-based variable that was related to buccal attachment loss. This relation was stronger when the individual mean value of the attached gingiva was low. The estimates of the coefficients, with their standard errors, are shown in Table 3.

Discussion

The individuals included in the present study were identified in an earlier cross-sectional study on periodontal conditions in adolescents (Källestål et al. 1990, Källestål & Matsson 1990). In that study, it was found that the probing pocket depth in individuals with buccal attachment loss ⩾2 mm never exceeded 2 mm. A further analysis (not published) showed that this still applied to most subjects if the group was extended to include individuals with buccal attachment loss ⩾1 mm. Thus, with the present threshold of ⩾1 mm for buccal attachment loss, the gingival margin is situated close to the cemento-enamel junction.

Studies of the reproducibility of measurements of probing pocket depth and probing attachment level have shown that the vast majority of duplicate recordings, primarily performed at proximal surfaces and in comparably deep pockets, vary within 1.5 mm (Badersten et al. 1984). Their measurements appear to have been performed using a direct measurement technique and not the indirect technique used in the present study where a calculated value of the attachment level is used. As the present method might give even more variation in results when reproduced, a conservative threshold for recording loss of attachment of ⩾2 mm was used in our earlier studies (Källestål et al. 1990, Källestål & Matsson 1990, Källestål et al. 1991), which included proximal as well as buccal/lingual surfaces. In the present study where the buccal attachment level is determined the criterion for attachment loss was changed to ⩾1 mm. The easy access to buccal surfaces as well as the shallow pockets results in a higher reproducibility of the recordings than when proximal surfaces are included (Badersten et al. 1984), thus allowing the use of a lower level as criterion for attachment loss.

The aim of the present study was to identify factors that may be related to buccal attachment loss in young individuals. The results may form a basis for future prospective studies of buccal attachment loss. Statistical analyses were performed in three steps, where the χ^2 test was used to compare the present results with findings from earlier studies, the logistic regression analysis provided assessments of the effects of combinations of subject-based exposure variables and the variance components analysis examined the relations between site-based exposure variables and buccal attachment loss.

The design of the present study is basically of the cross-sectional case-referent type, but the presence of 2 case subgroups, gives an opportunity to differentiate between recently acquired and more long-standing attachment loss. Moreover, as the subgroup of subjects identified as having buccal attachment loss in 1987 was followed for two years, progression could be studied here. It is worth noting that in a majority of subjects (75%), progression in terms of the number of affected sites occurred during this period.

The methods for the evaluation of buccal alveolar tissue width and buccal displacement of teeth were developed for the present study and represent an attempt to indirectly characterize the

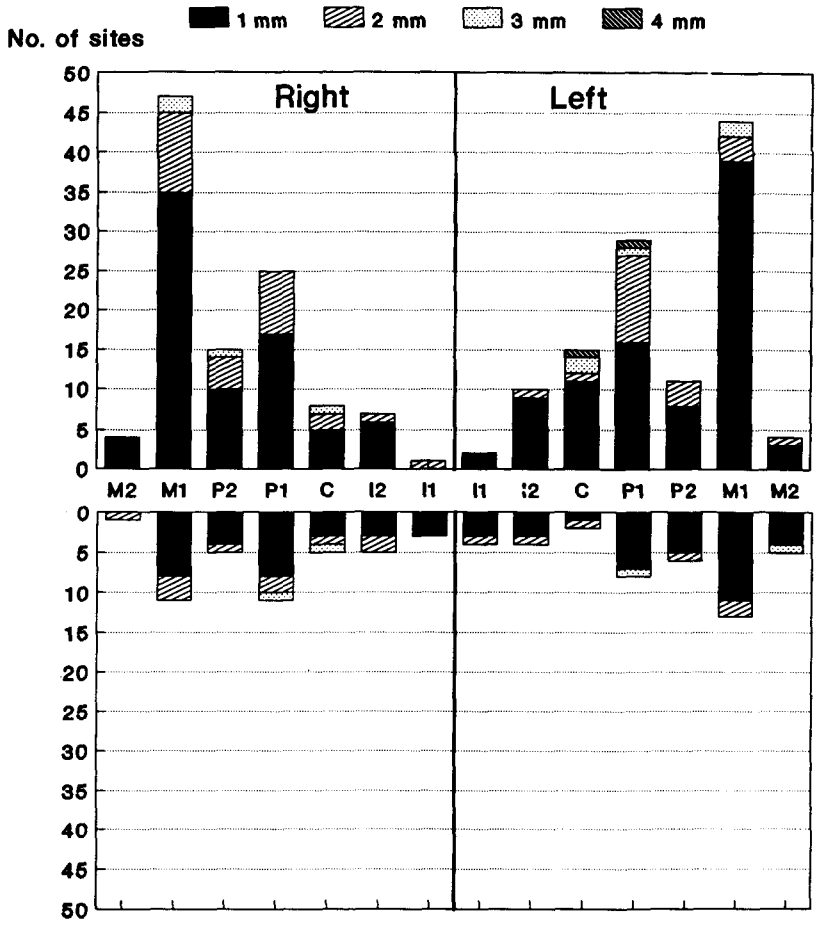

Fig. 3. Intraoral distribution of buccal attachment loss in the combined case group. No. of sites and loss of attachment (mm).

anatomy of the buccal alveolar process. The validity of the measurements has not been estimated and this should be taken into account when interpreting the results. Low values for width of buccal alveolar tissue were associated with buccal attachment loss in both the site-based variance components analysis and in the subject-based χ^2 test. On the contrary, the positive sign of the parameter estimate for width of buccal alveolar tissue in the logistic regression analysis (Table 3) means that the higher the value for the parameter, the more likely the individual is confined to the group with buccal attachment loss. However, it should be kept in mind that the value for buccal alveolar tissue in this analysis is an average value for the individual that may include sites with low as well as high figures. Presence of teeth with buccal displacement tended to be associated with buccal attachment loss in the χ^2 test. This indication that the factors assessing properties of the anatomy of the buccal alveolar process is associated with loss of buccal attachment, may essentially agree with the finding by Löst (1984) of a correlation between presence of gingival recession and bone dehiscence depth assessed after surgical exploration. The method being developed by Löst et al. (1988), based on ultrasonic technique, for determining the thickness of the facial alveolar bony plate is in this respect of interest for future studies.

The attached gingiva as a necessary anatomical property for the maintenance of periodontal health has been thoroughly discussed in the literature (Lang & Löe 1972, Wennström 1982, Ericsson & Lindhe 1984, Schoo & van der Velden 1985, Stetler & Bissada 1987, Wennström 1987). In the present study, low values for width of attached gingiva were found to be related to buccal attachment loss. The causal connection was not addressed in this study, however, and the results could have to do with the obvious fact that the width of the attached gingiva is reduced when buccal attachment loss is present, rather than pointing to a relationship between a narrow zone of attached gingiva and a susceptibility for buccal attachment loss.

No differences in the use of smokeless tobacco between the referent and the case group were detected in the present study, in contrast to a study of 14-year-old boys in Atlanta (Offenbacher & Weathers 1985). In that study recessions were found more often in boys who used smokeless tobacco and had gingival inflammation. The low level of gingivitis in the present study might be the reason for the lack of a relationship between use of smokeless tobacco and buccal attachment loss. Other explanations might be different brands of tobacco as well as differences in the frequency of tobacco use and the different ages of the two populations.

Baker & Seymour (1976) suggested a localized inflammatory process as an etiological factor for gingival recessions. They speculated that the inflammatory reaction causes breakdown of the connective tissue leading to proliferation of the epithelium into the site of connective tissue destruction. This process would involve tissue remodelling, leading to gingival recession. This hypothesis is not contradicted by the present findings, as the authors also suggest that the remodelling process is particularly likely to occur where the tissue is thin, such as over bone dehiscences. They also point out that the inflammation needed to initiate this remodelling in such deli-

Table 3. Results of the statistical analyses

Variable	χ^2	Log. reg. parameter estimates	Variance comp. parameter estimates
width of alveolar tissue	$p=0.049$	1.037 ($p=0.085$)	−0.123 (SE=0.052)
width of attached gingiva	$p=0.003$	−0.951 ($p=0.000$)	−0.234 (SE=0.066)
buccal displacement	$p=0.096$	–	–

cate tissues may be very localized and not clinically recognizable.

Our earlier analytic study (Källestål & Matsson 1990) revealed relationships between buccal attachment loss ($\geqslant$2 mm) and presence of plaque and gingivitis, respectively. No such associations were found in the present study, most likely because plaque and bleeding on probing at buccal sites are poor indicators of general oral hygiene and the level of gingivitis. The lack of a site-based relation between plaque and bleeding on probing, respectively, and buccal attachment loss is probably explained by the high level of hygiene in these adolescents: 39% had no buccal site with plaque and 35% had no buccal site with bleeding. Those who did present sites with plaque and/or bleeding had only a few such sites.

The analysis of the baseline data (Källestål & Matsson 1990) showed that the subjects with buccal attachment loss brushed their teeth more often than those without attachment loss. This was not confirmed in the present study. Several authors have reported correlations between factors connected with toothbrushing and gingival recessions, i.e., length of service of toothbrush and toothbrushing technique, assessed by questionnaire (Paloheimo et al. 1987, Frentzen et al. 1989) or by observation (Björn et al. 1981). In the present study, we tested a variety of factors connected with toothbrushing, assessed both by observation of toothbrushing and by interview (Table 2). The lack of a relationship between these factors and buccal attachment loss might be due to low validity of the interviews and/or of the observations of toothbrushing. Toothbrushing performed in a dental health clinic may not correspond to conditions at home. Another, more plausible reason could be the high and uniform level of oral hygiene in this population: 84% of the subjects brushed 2 times/day (Källestål et al. 1990), only 9% used a toothbrush with hard bristles, only 6% brushed $\leqslant$2 min and 92% were judged to brush their teeth in a systematic way. This makes it difficult to detect relations between oral hygiene factors and buccal attachment loss in the present population. However, it does not rule out the possibility that differences in toothbrushing habits are related to the differences in prevalence of buccal attachment loss, but this could not be demonstrated in the present sample.

To summarize, the results from the present study indicate that factors associated with the anatomy of the buccal alveolar process is related to buccal attachment loss in populations where the level of oral hygiene is high. The study design makes it possible to identify factors associated with buccal attachment loss. To evaluate the importance of possible risk factors or etiological factors for the development of buccal loss of tooth support, prospective epidemiological or experimental studies are needed.

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Zusammenfassung

Bukkaler Attachmentverlust bei schwedischen Jugendlichen

Zur Identifikation von Faktoren, die mit bukkalem Attachmentverlust bei Jugendlichen zusammenhängen, wurde eine fallbezogene Untersuchung vorgenommen. Die untersuchte Gruppe bestand aus 18 Jahre alten Personen, die 2 Jahre vorher an einer Studie über die parodontalen Verhältnisse bei Jugendlichen teilgenommen hatten. Als Kriterium zur Teilnahme an dieser Fallstudie galt ein bukkaler Attachmentverlust von $\geqslant$1 mm an einer oder mehreren Stellen. Informationen über 28, für ihren Zusammenhang mit dem Vorkommen von Rezessionen bekannten Variablen, wurden mittels klinischer Untersuchung, Befragung und Beobachtung der Probanden eingeholt. Die Vergleichsgruppe bestand aus 66 und die untersuchte Gruppe aus 71 Personen. Die Untersuchungsgruppe bestand aus zwei Untergruppen. Bei der einen lagen die bukkalen Attachmentverluste bereits 1987 vor, bei der anderen wurden sie erst in den Jahren 1987–89 festgestellt. Um mit dem bukkalen Attachmentverlust zusammenhängende Faktoren zu identifizieren, wurden statistische Analysen mit dem χ^2 Test, mit logistischer Regression und mit einem Varianzkomponenten-Modell vorgenommen. Solche Faktoren waren: dünnes Gewebe auf dem Alveolarfortsatz, geringe Breite der festen Gingiva und bukkal verschobene Zähne. Die Resultate deuten darauf hin, daß bei Versuchsgruppen mit hohem Mundhygieneniveau eine Abhängigkeit des bukkalen Attachmentverlustes von der Anatomie des Alveolarfortsatzes besteht. Zur Beurteilung der Bedeutung von denkbaren Risiko- oder ekologischen Faktoren bei der Entstehung von Verlusten an bukkalen Zahnhaltegeweben, bedarf es prospektiver epidemiologischer oder experimenteller Studien.

Résumé

Perte d'attache vestibulaire chez des adolescents suédois

Des adolescents âgés de 18 ans avaient participé à une étude sur les conditions parodontales de l'adolescent. Ceux qui avaient eu une perte d'attache $\geqslant$1 mm au niveau d'un ou de plusieurs sites pendant les deux dernières années ont fait partie du groupe test. Des informations portant sur 28 possibilités de source de récession ont été prises lors d'un examen clinique et d'un interview. Le groupe contrôle consistait en 66 individus et le groupe test de 71 personnes comprenait deux sous-groupes: l'un ayant eu une perte d'attache déjà enregistrée lors du premier examen et l'autre ayant subi cette perte durant les deux dernières années. Les analyses statistiques comprenant le test du χ^2, l'analyse de régression et le modèle à composant de variance, ont été utilisées pour détecter tout facteur en relation avec la perte d'attache vestibulaire. Ces facteurs étaient le tissu alvéolaire fin, l'étroitesse de gencive attachée et le présence de dents versées en vestibulaire. Les résultats ont indiqué que l'anatomie du procès alvéolaire vestibulaire est en relation avec la présence de perte d'attache vestibulaire dans les populations avec un haut niveau d'hygiène buccale. Des études épidémiologiques prospectives et expérimentales sont nécessaires pour évaluer l'importance des facteurs probables de risque ou étiologiques.

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