The Degree to Which Dental Attrition in Modern Society is a Function of Age and of Canine Contact

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Dental attrition ranked according to a validated severity scale was correlated with age as a proxy for functional wear in 148 asymptomatic subjects. Anterior, posterior, mediotrusive, laterotrusive, and total attrition severity was analyzed. The geometric contribution of canine attrition to the variance of posterior attrition was also tested through correlations, and the time span required to record a statistically significant difference in attrition using the scale was determined. Age explained 12.6% of the differences in the total attrition scores ($P < .001$, Spearman's rho), 6.4% of the anterior scores ($P < .01$), and 20.9% of the laterotrusive scores ($P < .0001$). Canine wear in subjects aged 20 to 49 years explained between 20% to 34% of the posterior attrition ($P < .05$ to $P < .001$), 6% to 36% of the mediotrusive attrition ($P < .05$ to $P < .01$), and 20% to 29% of the laterotrusive attrition ($P < .05$ to $P < .001$). At least 20 to 30 years was necessary to show significant clinical differences, except that laterotrusive attrition changes could be discriminated in only 10 years for the 20- to 29-year-old group. Notable attrition was already evident in the 20- to 29-year-olds, and accelerated wear rates prior to age 20 years were not maintained in most areas of the dentition. A nonlinear progression with age was observed, thereby inhibiting prediction of subsequent attrition from prior levels. Attrition was concluded to have multifactorial etiology, with age and the geometry of canine guidance having a significant influence, in addition to commonly accepted parafunction.
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Although dental attrition is a cumulative record of both functional and parafunctional wear, it is often used by the clinician as evidence of current bruxism. An estimate of the level of ongoing bruxism is particularly important in designing dental restorations, or in deciphering whether bruxism may be a complicating component of a patient's symptomatology. Thus, it would be useful to know how much attrition is attributable to bruxism and how much is attributable to other factors.

The current article describes estimates of the influence of age on attrition as a proxy for functional wear in a cross-sectional, case history study of asymptomatic subjects across a broad age range (20 to 72 years). This includes subquestions regarding the necessary age range to discern a clinical difference in dental attrition, and whether the record of past wear can predict future group wear rates. Additionally, the authors examined whether the amount of posterior tooth attrition is merely a reflection of the geometric pattern of wear once canine and incisor guidance has been reduced.

Dentists commonly ignore the functional contributions and indict all noticeable attrition in modern society as abnormal. In comparison, advanced dental attrition was concluded to be normal in native skull samples, in which most occlusal anatomy was abraded away by 12 years of age due to diet and use of the dentition as a tool.[1] Given the lack of abrasive diet in modern society, functional wear is expected to occur more slowly than was found in skull study records of primitive societies.[2] In developed countries, mutual protection occlusion preserves occlusal anatomy into adulthood. Nevertheless, canine guidance is usually replaced by group function during young adulthood and becomes the normal occlusal pattern by middle age.[3]

Because functional wear in modern samples occurs slowly,[4,5] age was proposed as a reasonable proxy for studying this kind of attrition. However, little difference was found in attrition scores according to age of nonpatients within an age range of 19 to 40 years in an earlier study.[6] It was hypothesized that a large proportion of the preceding attrition observed in this population occurred early as a result of parafunction in teenage and childhood years and plateaued across the 19- to 40-year-age range represented. To discern and follow the effects of subsequent functional wear, the current study examined an expanded age range.

The specific null hypotheses tested were the following:

1. Attrition is not directly correlated with age.
2. There is no minimum age range for discerning a longitudinal difference in attrition by use of a severity ranking.
3. Canine attrition is not directly correlated with posterior attrition.

Materials and Methods

Subjects

A total of 148 asymptomatic subjects (48 women, 100 men; aged 20 to 72 years) were screened to exclude any subjects with symptoms, signs, or history of temporomandibular disorders from a population of dental and dental hygiene students and general dental patients from a private practice setting (DAS).

Data Collection

All samples were examined according to the same strict criteria.[7] Dental casts were graded for severity and location of wear facets, as described previously.[6] All scoring was performed by one calibrated observer after both authors evaluated 10 casts selected at random.

The severity scoring was a contraction of the method by Richards and Brown[8] abbreviated to fewer groups, owing to the inability in this study to absolutely identify dentin exposure on dental casts. All scoring was performed according to the following five-point scale (Fig 1):

0 = No wear
1 = Minimal wear
2 = Noticeable flattening parallel to the occluding planes
3 = Flattening of cusps or grooves
4 = Total loss of contour and/or dentin exposure when identifiable

The facets were graded in seven zones: incisor; right and left canine; right and left premolar and molar laterotrusion (interpreted as "a" and "c" contact locations, Fig 1); and right and left premolar and molar mediotrusion (interpreted as "b" contact locations, Fig 1). The worst score finding was recorded in each zone.

The maximum possible laterotrusion score for the posterior dentition was 2 premolar and 2 molar zones × 2 facet locations × maximum severity score of 4 = 32. The maximum possible mediotrusion score for the posterior dentition was 2 premolar and 2 molar zones × 1 facet location × maximum severity score of 4 = 16. The maximum possible anterior score was 1 incisor and 2 canine zones × 1 facet location × maximum severity score of 4 = 12. A total attrition score of 60 was the sum of the individual anterior and posterior attrition scores.

Statistical Analysis

To increase the power through the use of sufficient numbers of subjects and to reduce beta-type errors (defined as a statistical determination of no difference when one actually exists), 10 years was the minimum age interval used in the analysis. A difference of $P < .05$ was defined as significant.

A Spearman's rank correlation was performed for the total attrition score against age to estimate the amount of the variance in the attrition scores that could be explained by age.

The score rankings for the different age groups were compared through a Mann-Whitney *U* test to determine the minimal age range needed to show a cross-sectional difference in attrition scores.

A Spearman's rank correlation was performed for the mediotrusive and laterotrusive wear scores

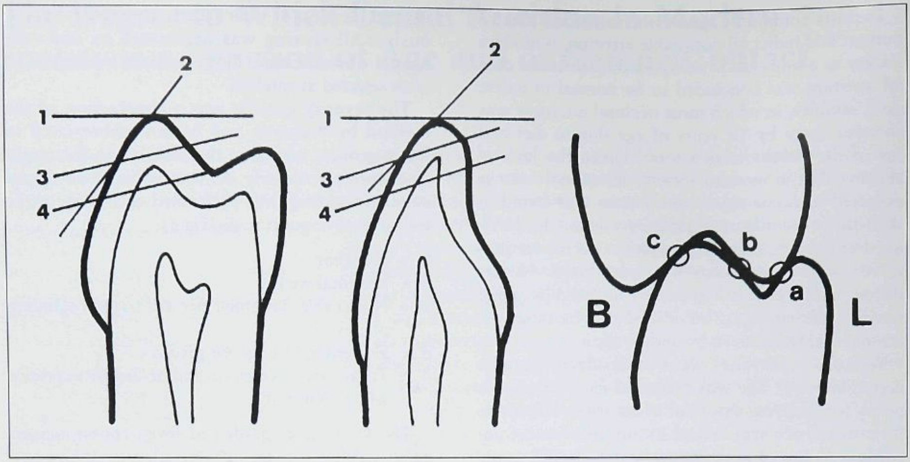

Fig 1 Attrition score criteria *(left and center)*: 1 point = minimal wear of cusp or incisal tips; 2 points = facets parallel to the normal planes of contour; 3 points = noticeable flattening of cusps or incisal edges; 4 points = total loss of contour and dentin exposure when identifiable. The "a" and "c" locations *(right)* correspond to contact in laterotrusion, and the "b" location corresponds to mediotrusion posterior tooth facets. (B = buccal, L = lingual.)

against the canine wear scores for each age range to estimate the amount of the variance in the posterior attrition scores that could be explained by canine attrition.

Results

The correlation between age and the total attrition score in asymptomatic subjects was statistically significant but low ($\rho = .355$, $t = 4.594$, df = 146, $P < .001$), and as a proxy for functional wear, the correlation explained only 12.6% (ρ^2) of the total attrition score. Similarly, the correlation between age and the anterior score was low ($\rho = .252$, $t = 3.152$, df = 146, $P < .01$). The correlation between age and the laterotrusive score was moderate ($\rho = .457$, $t = 6.210$, df = 146, $P < .0001$). The correlation between age and the mediotrusive score was statistically insignificant ($\rho = .100$, $t = 1.219$, df = 146, $P < .300$). Age (between 19 and 72 years), therefore, explained 6.4% (ρ^2) of the anterior attrition score and 20.9% of the laterotrusive attrition score.

Descriptively, both the median and mean rank of the total attrition scores increased with age (Table 1, Fig 2). However, the median total and the anterior attrition scores essentially plateaued to age 40 to 49 years and the mediotrusion score until age 50 to 59 years (Tables 1 to 3, Fig 3). The laterotrusive median scores showed a large increase occurring between the 20- to 29- and the 30- to 39-year-old age groups, and then plateaued until age 50 to 59 years (Table 4, Fig 2).

An age separation of at least 20 to 30 years was necessary to show clinical differences in attrition scores for most attrition groups (Tables 5 to 8). Laterotrusive attrition was the exception (Table 8) in that a statistically significant difference was discernable in just a 10-year period for the 20- to 29-year-old group.

The correlations between canine wear scores and posterior wear scores were statistically significant only until 40 to 49 years of age (Tables 9 to 11) and then the correlations disappeared. Between age 20 to 49 years, canine wear explained 20% to 34% of the total posterior wear (ρ^2), 20% to 29% of laterotrusive wear, and 6% to 36% of mediotrusive wear.

Discussion

The overall findings of this attrition study indicate that the contribution of normal aging and the

Table 1 Total Attrition Scores

Age (y)	Median	Mean rank	n
20 to 29	31	62.56	79
30 to 39	33	74.40	20
40 to 49	32	76.86	21
50 to 59	36	92.00	16
60 to 72	44	123.33	12

Table 2 Anterior Attrition Scores

Age (y)	Median	Mean rank	n
20 to 29	8	69,26	79
30 to 39	7	62.90	20
40 to 49	8	69.69	21
50 to 59	9	85.59	16
60 to 72	10.5	122.00	12

Table 3 Mediotrusive Attrition Scores

Age (y)	Median	Mean rank	n
20 to 29	8	73.68	79
30 to 39	8	61.53	20
40 to 49	8	70.19	21
50 to 59	8	77.09	16
60 to 72	11	105.63	12

Table 4 Laterotrusive Attrition Scores

Age (y)	Median	Mean rank	n
20 to 29	15	58.12	79
30 to 39	19	85.50	20
40 to 49	17	82.48	21
50 to 59	19	97.09	16
60 to 72	23	119.92	12

geometry of canine function should be included in the evaluation of posterior attrition and that not all wear can be attributed to parafunctional habits.

Pattern of Attrition by Age

In the present study, age is considered to be a proxy for functional wear. The results show that an age-related component makes a larger contribution to laterotrusive attrition (20.9%) than to anterior tooth wear (6.4%) or to mediotrusive attrition (not significant) (see Tables 2 and 4). Indirect evidence for an increase in attrition severity with age is plentiful. The prevalence of dentin exposure increases with advancing age in both primitive societies[9,10] and modern societies.[11-23] Direct estimates of functional attrition rates are also available and average about 50 μm per year for the posterior teeth.[4,5,10,24] These rates are somewhat dependent on the specific tooth,[5] and they gradually reduce over time due to the increase in occlusal contacts,[13,14] which affects the depth of wear and volumes of loss.[13] This causes a proportional decrease in force per unit of surface area due to a proportional increase in the base area and a proportional decrease in vertical height.[13]

Subjects who brux heavily would show faster rates of attrition than subjects who brux less, but static clenching would not appear in attrition studies. Longitudinal comparison of the wear rates between known heavy bruxers (from 400 to greater than 500 μm per year) and nonbruxers (up to 100 μm per year) indicated that 20% to 25% of attrition is due to chewing, swallowing, and other functional tooth contacts, while 75% to 80% is due to parafunction. This estimate of the functional wear component is similar to the range estimated by the relation of age to attrition in the present study. However, previous studies did not include other possible contributors to attrition severity such as occlusal geometry. The current study points out the expectation for further modification of both functional and parafunctional wear by the stages of the geometry of anterior guidance and other possible occlusal factors.

Noticeable attrition was already evident in the 20- to 29-year-old group studied, as evidenced by median attrition scores, which were 52% of the possible total (see Tables 1 to 4). Much of the clinically obvious attrition in adults is therefore established by 20 to 29 years of age. The literature points out that the severe attrition levels seen in very young populations cannot be explained by the known rates of functional wear.[4,5,10,24] Dentin exposure and major loss of crown height is described as already common in children and teenagers[16,25,26] and young adults.[6,15,16,18,25,27,28]

The presumed rate of wear preceding that in the 20- to 29-year-old group was not maintained (see Tables 1 to 4, Figs 2 and 3). Thereafter, the rate of attrition slowed, if not plateaued, through the young adult period, except for the rate corresponding to laterotrusive contact, which did not plateau until the 30- to 39-year age range (Table 4). Since wear did not progress linearly with age, it must be recognized that the existing cumulative record of attrition does not predict the subsequent rate of attrition (Tables 5 to 8). This may have important clinical bearing on the expected wear and success of a planned prosthodontic reconstruc-

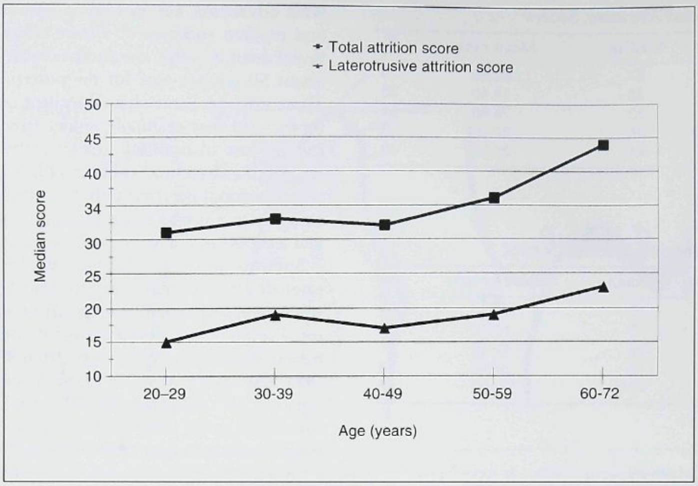

Fig 2 Median attrition scores for each 10-year age range for total attrition and laterotrusive attrition. The potential range for total attrition was 0 to 60, and the range for laterotrusive attrition was 0 to 32.

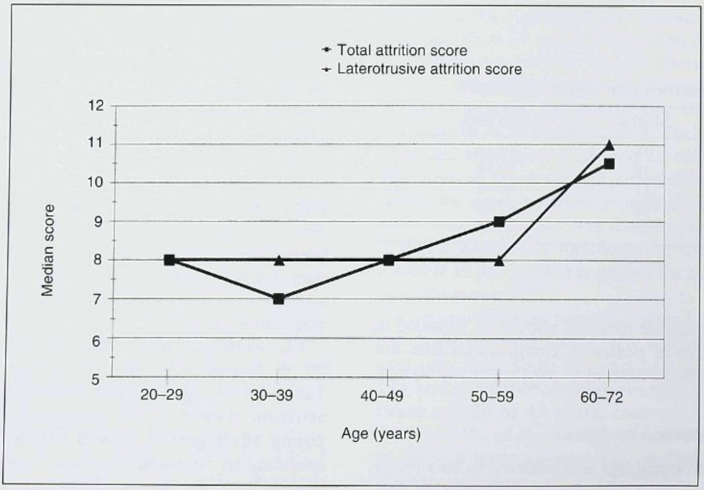

Fig 3 Median attrition scores for each 10-year age range for anterior attrition and mediotrusive attrition. The potential range for anterior attrition was 0 to 12, and the range for mediotrusive attrition was 0 to 16.

Table 5 Differences† in Total Attrition Scores by Age

Age (y)	30 to 39	40 to 49	50 to 59	60 to 72
20 to 29	z = 1.09 NS	z = 1.27 NS	z = 2.61 **	z = 4.41 ***
30 to 39	–	z = 0.22 NS	z = 1.12 NS	z = 3.23 **
40 to 49	–	–	z = 1.08 NS	z = 2.75 **
50 to 59	–	–	–	z = 2.48 *

*$P < .05$
**$P < .01$
***$P < .001$
†Mann-Whitney *U* test
NS = not significant.

Table 6 Differences† in Anterior Attrition Scores by Age

Age (y)	30 to 39	40 to 49	50 to 59	60 to 72
20 to 29	z = 0.79 NS	z = 0.59 NS	z = 1.52 NS	z = 4.18 ***
30 to 39	–	z = 0.30 NS	z = 1.45 NS	z = 3.33 **
40 to 49	–	–	z = 0.95 NS	z = 2.77 **
50 to 59	–	–	–	z = 2.48 *

*$P < .05$
**$P < .01$
***$P < .001$
†Mann-Whitney *U* test
NS = not significant.

Table 7 Differences† in Mediotrusive Attrition Scores by Age

Age (y)	30 to 39	40 to 49	50 to 59	60 to 72
20 to 29	z =1.13 NS	z = 0.36 NS	z = 0.21 NS	z = 2.52 *
30 to 39	–	z = 0.65 NS	z = 1.18 NS	z = 2.61 **
40 to 49	–	–	z = 0.55 NS	z = 2.05 *
50 to 59	–	–	–	z = 1.69 NS

*$P < .05$
**$P < .01$
†Mann-Whitney *U* test
NS = not significant.

Table 8 Differences† in Laterotrusive Attrition Scores by Age

Age (y)	30 to 39	40 to 49	50 to 59	60 to 72
20 to 29	z = 2.65 **	z = 1.50 NS	z = 3.42 ***	z = 4.30 ***
30 to 39	–	z = 0.34 NS	z = 0.88 NS	z = 2.72 **
40 to 49	–	–	z = 1.08 NS	z = 2.30 *
50 to 59	–	–	–	z = 2.16 *

*$P < .05$
**$P < .01$
***$P < .001$
†Mann-Whitney *U* test
NS = not significant.

Table 9 Correlation Between Canine Wear and Mediotrusive Posterior Tooth Wear†

Age	*df*	$(\rho_1 - \rho_2)^2$	ρ	*t*	$P \leq$
20 to 29	77	62,200	.243	2.20	.05
30 to 39	18	527	.604	3.21	.01
40 to 49	19	830	.461	2.26	.05
50 to 59	14	510	.249	0.96	NS
60 to 72	10	140	.510	1.88	NS

†Spearman's rank correlation coefficient
NS = not significant.

Table 10 Correlation Between Canine Wear and Laterotrusive Posterior Tooth Wear†

Age	*df*	$(\rho_1 - \rho_2)^2$	ρ	*t*	$P \leq$
20 to 29	77	43,034	.476	4.75	.001
30 to 39	18	620	.534	2.68	.02
40 to 49	19	847	.450	2.20	.05
50 to 59	14	532	.218	0.83	NS
60 to 72	10	195	.320	1.07	NS

†Spearman's rank correlation coefficient
NS = not significant.

Table 11 Correlation Between Canine Wear and Total Posterior Tooth Wear†

Age	*df*	$(\rho_1 - \rho_2)^2$	ρ	*t*	$P \leq$
20 to 29	77	45,132	.451	4.43	.001
30 to 39	18	555	.583	3.04	.01
40 to 49	19	819	.468	2.31	.05
50 to 59	14	523	.231	0.89	NS
60 to 72	10	157	.449	1.59	NS

†Spearman's rank correlation coefficient
NS = not significant.

tion of missing or carious dentition, and may be much slower and more favorable than the presenting attrition leads to believe.

For purposes of future study design, the authors conclude that longitudinal study of attrition requires more than a 20- to 30-year period if differences are to be discerned by using nonparametric severity scales rather than direct measurement. The exception was that early laterotrusive attrition in the 20- to 29-year-old group occurs rapidly enough for differences to be measured after only 10 years (Table 8).

Relationship to Occlusal Geometry

The geometry of the contact relationships of the dentition may be as important as functional and parafunctional factors in determining the distribution and total wear. Separate from examination of age effects, canine wear explained 20% to 34% of the total posterior attrition (Tables 9 to 11). Of interest, the contribution to mediotrusive wear was delayed, presumably until there was sufficient canine wear to permit contralateral contact. Meanwhile, the relationship of ipsilateral (laterotrusive) wear to canine attrition was already strong in the 20- to 29-year-old group, presumably representing the natural progression from canine guidance to group function described in young adults.[3] Wear is thus a multifactorial problem explained by simple factors of geometry in addition to parafunction, including possibly crowding, occlusal slides, dual bites, crossbites, Angle's classification, as well as functional chewing habits, and diet.

Anterior attrition permits functional contacts in the posterior teeth that would not have been otherwise possible.[2,29] Progressive attrition allows for increasingly generalized contact to occur with protrusive and laterotrusive mandibular movements and is a major determinant of maximum intercuspation (intercuspal position).[13] Attrition itself encourages additional attrition by the body's natural avoidance of single tooth contacts and the seeking out of movements that will allow for the greatest number of contacting surfaces.[3,30]

Evidence that posterior attrition is enhanced by canine attrition was seen in our study. Canine wear explained between 20% and 34% of the posterior wear scores between the ages of 20 and 49. Others have also found greater attrition in subjects without canine-protected occlusion,[31] and in subjects who had Class III malocclusion with reduced canine-protected occlusion.[6,31] Shupe et al[32] found that subjects with canine-protected occlusion had reduced occlusal forces in the posterior teeth, which might explain some of the reduced wear.

There is usually an inexorable progression from canine-protected occlusion in adolescence to group function in adulthood.[3] However, group function also predominates in young subjects without notable attrition, so this occlusal scheme is not necessarily the outcome of severe wear.[33] Nevertheless, by adulthood, group function with broad occlusal faceting is typical, while canine-protected occlusion, round occlusal surfaces, and one-to-one tooth relationships are rare.[3,13,31,33] Because anterior teeth are the first to show notable attrition,[17,21,27,28,34,35] some of the later posterior attrition is certainly a direct result of the reduced canine protection.

Barrett[29] and Murphy[36] both described an attrition progression in aboriginal Australians, who show a progression in dental faceting from anterior to laterotrusive posterior, and finally to mediotrusive posterior wear. This agrees with our own finding that mediotrusive posterior attrition appears to lag laterotrusive posterior attrition by about 10 to 20 years.

A model composed of four stages is proposed for attrition progression in modern society (see Figs 2 and 3). Initially as the teeth first erupt, steep anterior guidance prevents posterior attrition despite parafunctional and other influences, but anterior attrition proceeds faster than would be expected by only functional wear. Once the reduced anterior guidance permits posterior tooth contact in excursion movements, parafunction and other effects accelerate the number and severity of attrition facets (rapid attrition phase). By age 20 to 29, attrition has slowed in most areas of the mouth (Figs 2 and 3), except for moderate increases in laterotrusive faceting, until 30 to 39 years of age (stable stage) as wear continues in group function (Fig 2). Over the next 30 years, changes in sleep patterns plus a broadening of facets reduce the frequency and effects of parafunction, so the gradual increase in wear scores, particularly in laterotrusion, are thought to more clearly reflect functional wear. The rate of functional wear in adulthood remained quite low and was not statistically different from the 20- to 29-year-old group until greater than 59 years of age (final stage).

The clinical implications of this model would suggest that observation of severe attrition in adults is a largely cumulative record and may not refer to an ongoing phenomenon. Invasive treatment for supposedly heavy bruxism may therefore be redundant if the current activity only relates to slow functional wear.

Future Directions

Research is needed to validate the proposed multifactorial etiology of attrition and the proposed model of the pattern of attrition over time.

Because canine attrition contains a component of age-related wear, it would be inappropriate to summate the contribution of age (functional wear) with canine wear on posterior teeth without a complete multiple-regression study. However, it can be estimated to be between a high of 54% and a low of 20%, according to this study. By corollary, the contribution by factors other than age and the geometry of canine wear is between 46% and 80%. Thus the decision tree for evaluating the etiology of attrition in a patient must include all possible factors. A restricted indictment of parafunctional habits is inappropriate, unless it is shown in a multiple-regression analysis that all other possible factors, such as age and canine attrition, can be excluded. According to the present study, this is extremely unlikely.

Many other factors have been shown to increase attrition rates, and these include recent dental restorations,[5,17,35] tough diets,[37-39] male gender,[6,12,15,18,19,21,23] some occupations,[12] some psychologic factors,[12] and the strength of individual bite force.[39] Saliva acidity has been shown to be both associated[20] and unassociated[25,37] with dental attrition. Future research should elucidate the impact that each of these factors has on individual attrition rates.

Limitations of the Study

The study population deviates from a general urban sample with respect to benign temporomandibular disorder (TMD) signs and symptoms. Because of the continuing belief by the general profession that attrition and bruxing are potent etiologic factors in TMD, subjects with any TMD symptoms or signs were eliminated. This was done in spite of the fact that virtually no association is shown between attrition and TMD symptoms and disease.[6,40]

This cross-sectional study speaks to general trends and not to individual variation or prediction of the influence of age to attrition severity in a particular individual. In this large sample, three subjects older than 50 years were among the 25% with the least attrition, and 20% of the quartile with the most attrition were younger than 30 years. Thus, on an individual basis, some people will maintain a very low level of dental wear throughout their lives, and others will show very high levels early in life.

This study employs established methodology for ranking dental attrition. However, while the results of the analysis are consistent with the results of prior studies showing a slow increase in cross-sectional attrition severity over time, the classification system may not be entirely linear. The scale may allow a rapid rise from a score of 0 (no wear) to 2 (flattening parallel to the occluding planes), but a change from a score of 3 (flattening of cusps and grooves) to 4 (total loss of contour) may require a major increase in observed attrition. Thus, a central tendency, with scores of 2 or 3 much more common than the other scores, was basically assured. The correlation of medians to means was high ($\rho = .89$, $P < .001$), indicating a normal distribution of the medians around the means, with the central tendency summarized by both the medians and the means. The broad scoring range (0 to 60) also allowed for a reasonable separation in individual variation and encourages the continued use of this classification system.

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Resumen

El Grado Hasta el Cual la Atrición Dental en la Sociedad Moderna es una Función de la Edad y de los Contactos del Diente Canino

El grado de atrición dental fue correlacionado con la edad como un agente de desgaste funcional en 148 personas asintomáticas, de acuerdo a una escala de severidad validada. Se analizó la severidad de la atrición anterior, posterior, en protrusiva media, en laterotrusión, y total. También se examinó la contribución geométrica de la atrición canina a la varianza de la atrición posterior, por medio de correlaciones al igual que el período de tiempo requerido para registrar una diferencia estadísticamente significativa en la atrición utilizando la escala. La edad sirvió como explicación para el 12,6% de las diferencias en los resultados de atrición total ($P < 0,001$, rho de Spearman), el 6,4% de los registros anteriores ($P < 0,01$), y el 20,9% de los registros de laterotrusión ($P < 0,0001$). En el caso de los sujetos de 20 a 49 años de edad, el desgaste del canino se consideró fue el motivo del 20% al 34% de la atrición posterior ($P < 0,05$ a $P < 0,001$), del 6% al 36% de la atrición protrusiva media ($P < 0,05$ a $P < 0,01$) y del 20% al 29% de la atrición en laterotrusión ($P < 0,05$ a $P < 0,001$). Se determinó que como mínimo de 20 a 30 años eran necesarios para mostrar diferencias clínicas significativas, excepto que los cambios de la atrición en laterotrusión podían ser distinguidos en sólo 10 años para el grupo cuyas edades oscilaban entre los 20 y 29 años de edad. Las personas de 20 a 29 años de edad ya presentaban una atrición notable, pero los porcentajes de desgaste acelerado antes de los 20 años de edad, no se mantuvieron en la mayoría de las áreas de la dentición. Se observó que la progresión no era lineal en relación a la edad, por lo cual no permitió la predicción de una atrición subsecuente a los niveles anteriores. Se concluyó que la atrición tiene una etiología multifactorial, y que la edad y la geometría de la guía canina tienen una influencia significativa, además de las parafunciones comúnmente aceptadas.

Zusammenfassung

Zahnattrition in der modernen Gesellschaft als Funktion des Alters und des Eckzahnkontaktes

Bei 148 asymptomatischen Probanden wurde die Zahnattrition—eingeteilt in eine validierte Skala—als Annäherung für funktionelle Abnützung mit dem Alter der Individuen korreliert. Der Schweregrad der anterioren, posterioren, mediotrusiven, laterotrusiven und totalen Attrition wurde beurteilt. Der geometrische Anteil der Eckzahnattrition an der Veränderung der posterioren Attrition wurde durch Korrelation getestet. Es wurde die Zeitdauer ermittelt, in der ein statistisch signifikanter Unterschied in der Attrition aufgezeichnet werden konnte unter Anwendung der Skala. Das Alter erklärte 12,6% der Unterschiede der totalen ($P < 0,001$, Spearmans Rho), 6,4% der anterioren ($P < 0,01$) und 20,9% der laterotrusiven Attrition ($P < 0,0001$).). Die Eckzahnabnutzung erklärte bei den 20- bis 49-jährigen Probanden zwischen 20% und 34% der posterioren ($P < 0,05$ bis $P < 0,001$), 6% bis 36% der mediotrusiven ($P < 0,05$ bis $P < 0,01$) und 20% bis 29% der laterotrusiven Attrition ($P < 0,05$ bis $P < 0,001$). Mindestens 20 bis 30 Jahre waren nötig, um klinische Unterschiede feststellbar werden zu lassen, ausser dass Veränderungen der laterotrusiven Attrition in der Gruppe der 20- bis 29-jährigen schon nach 10 Jahren ausgemacht werden konnten. Nennenswerte Attrition war in der Gruppe der 20- bis 29-jährigen feststellbar, wohingegen schnellere Attritionsraten in der Gruppe der unter 20-jährigen an den wenigsten Stellen der Dentition gesehen wurden. Man beobachtet eine nightlineare Progression mit dem Alter, womit eine Voraussage der zukünftigen Attrition aufgrund der schon erfolgten nicht möglich ist. Attrition hat eine multifaktorielle Aetiologie, in der das Alter und die Geometrie der Eckzahnführung, zusammen mit der Parafunktion, eine signifikante Rolle spielen.