The dentofacial morphology of bruxers versus non-bruxers

Susan E. Menapace, DMD, MDS; Donald J. Rinchuse, DMD, MS, MDS, PhD; Thomas Zullo, PhD; Calvin J. Pierce, DMD, PhD; and Hovhanness Shnorhokian, DMD, MDS, PhD

Man has had an insatiable interest in the morphology of the human body and face for thousands of years. The human form is ubiquitously displayed in early Greek and Roman Art. Sheldon[1] developed a classification for human body types, which he called somatotypes and consisted of ectomorph, mesomorph, and endomorph. Based upon an archial type cephalometric analysis, Sassouni[2] described nine facial types that generally account for the variability in the human face when facial vertical and horizontal proportions are compared.

An outgrowth of man's fascination with the study of human form was the search for the possible relationship between "form" (or "structure") and "function". The early French view of medicine made reference to the idea that a correlation existed between certain human "head and facial" shape patterns and the predominance of a particular physiologic function -i.e., cerebral, respiratory, digestive, or muscular types.[2] Each of Sheldon's three somatotypes were believed to be related to particular disease states. For example, the mesomorph was supposedly prone to circulatory disease and the ectomorph to respiratory disease.

In 1953, Lindegaard[3] presented evidence that ectomorphy is principally characterized by endochondral bone formation and endomorphy mainly by appositional bone formation. This led Björk[4] in 1955 to venture that difference in "bite development" was related to body build. Sassouni[2] related human facial type with headform and body build. He described the "openbite facial type" as generally possessing a dolichocephalic headform and an ectomorph somatotype. The "deepbite facial type" was characterized as brachycephalic and endomorphic.

From the interest in "form and function" relationships came the antilog theory introduced by

Abstract
The dentofacial morphology of 35 bruxers was compared with that of 28 non-bruxers. Direct head and facial measurements were made using anthropometric spreading calipers. Cephalic (head width vs. head length), facial (face height vs. face width), and "gonial" (gonial width vs. zygomatic width) indices were calculated, then headform and facial type were determined for all subjects. The findings demonstrated no difference in the dentofacial morphology between bruxers and non-bruxers (Chi square, $P \leq 0.05$). The predominant craniofacial type and dental morphology of both bruxers and non-bruxers were: dolichocephalic headform, euryprosopic facial type, and Angle Class I dental occlusion.

Key Words
Bruxism • Headform • Facial type • Dental occlusion

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Melvin Moss[5] that "function" leads to, or causes, a particular "form" - i.e., "Functional Matrix Theory of Growth". This view led Sassouni[2] to state, "The masseter and internal pterygoid muscles, by their action, directly influence the amount and direction of growth of the gonial process. In adult males with powerful masticatory muscles, the gonial processes flare externally."

With the "Functional Matrix" in mind, bruxism has been implicated as a primary cause of masticatory muscle hypertrophy, particularly affecting the masseter muscles.[6,7,8] For instance, Varrela[9,10] demonstrated that with marked dental attrition, the gonial angles are smaller and mandibular growth was redirected due to an increased anterior rotation in a sample of Finnish skulls. Ahlgren and associates[11] found maximal muscle tension, via EMG recordings, to be twice as great for bruxers than for age-matched non-bruxers. The muscle fiber diameter of the bruxer was found to be twice the normal size, and the bruxers also had small gonial angles, which was attributed to a "functional adaption (tissue charge response) to the increased mechanical stress on the masseter muscle".[11]

In addition, reduced muscle function has been demonstrated to affect craniofacial morphology. Kiliaridis, Mejersjo and Thilander[12] found that 24 adults with myotonic dystrophy (or long-face syndrome) had "weak" masticatory muscles and a prevalence of Angle's Class II malocclusion, anterior open bite, and lateral crossbite, as well as an open bite skeletal pattern with a vertical excess of the lower anterior facial height.

In keeping with the hypothesis that there is a relationship between bruxism and craniofacial morphology, but contrary to the idea that bruxism (i.e., "function") leads to a particular craniofacial morphology (i.e., brachycephalic headform and euryprosopic facial types), is the notion that perhaps a particular craniofacial morphology is predisposing for bruxism. Selye[13] conjectured that each individual has a particular "weak" organ system (i.e., Diathesis Stress Theory) which manifests in physical symptoms when subjected to emotional stress. Individuals with brachycephalic headforms and corresponding euryprosopic facial types may release emotional stress by taxing their stomatognathic system as they are equipped with the "heavy" facial architecture to energize this system.

Bruxism

Bruxism literally means to grind or gnash the teeth.[14] Nocturnal bruxers grind their teeth subconsciously while sleeping and diurnal bruxers clench their teeth during the day.[15,16] For the purpose of this study, bruxism is defined as the grinding or clenching of the teeth at times other than for the mastication of food.[14] The proposed causes of bruxism are: occlusal discrepancies, periodontal disease, psychological tension and emotional stress, genetics, and systemic factors such as endocrine, neurological and sleep disorders.[14-22] Today's evidence attributes the etiology of bruxism to the central nervous system where the phenomenon is thought to be mediated by the limbic system.[20,23,24] Bruxism has reportedly been said to cause muscle pain, TMJ clicking, gingival recession, loose or sensitive teeth, tooth fracture, attrition, dental intrusion or extrusion, and pupal pathology.[25,26] Reports of the prevalence of bruxism vary, ranging from 5% to 96% of the population.[26-30]

Craniomorphologic Headforms

There are three basic shapes to the head, i.e., dolichocephalic, brachycephalic, and mesocephalic.[5] The dolichocephalic headform is characteristically oval and long in the anteroposterior plane, yet narrow in breadth. The brachycephalic headform is more rounded and shorter in the anteroposterior dimension, but has a broader breadth. The mesocephalic headform is intermediary to both.

Craniomorphologic Facial Types

The topology of the face may be determined by the cranial base acting as a template. The dolichocephalic headform lends itself to a "Leptoprosopic" facial type with the face being narrow, long and protrusive.[5] The eyes are closely set, the forehead is sloping, the supraorbital rims are prominent, and the nose is thin, long and protrusive.

In contrast, the "euryprosopic" facial type is broader and shorter, and frontally appears flat or shallow.[5] This facial type corresponds to the brachycephalic headform.[5] The euryprosopic facial type is characterized by: wide-set eyes; a short, rounded "puglike" nose, with straight or convex bridge and an upturned nasal tip; an upright bulbous forehead; and prominent cheekbones.

The mesoprosopic facial type is the more neutral and lies between the leptoprosopic and euryprosopic facial types.[5]

Craniofacial Morphology and Occlusion

Works by Enlow and others[5,31,32,33] using "the counterpart analysis" demonstrated the effect of the position of the middle cranial fossa in establishing a relative maxillary or mandibular retrusion or protrusion. Also, the length and width of the counterparts have varying effects as to whether a dental Class I, II, or III occlusion will exist. The results of a study by Enlow, Kuroda, and Lewis in 1971[34] involving 137 Class I individuals, 118 Class II individuals and 47 Class III individuals, who were untreated and whose ages varied, showed that Class III individuals, and Class II type A individuals (those whose A point or supnasale is positioned more anteriorly than their B point or submentale) show distinct differences in facial pattern. The Class IIA and Class IA tended toward maxillary protrusion while the Class II and IB groups exhibited an underlying Class III tendency. The "B" type was more common among Class Is and the "A" type among Class IIs.

Bhat and Enlow[31] looked at facial variations as they related to headform type by evaluating facial form in 264 individuals with Angle's Class I and II with dolichocephalic, brachycephalic, mesocephalic and dinaric types of headforms. Their results indicated that more Class IA and Class IIA individuals were found in the dolichocephalic and mesocephalic headform types, while the brachycephalic and dinaric headform types have more Class IB types. They state that the leptoprosopic facial type and a Class II tendency to be characteristic of many dolichocephalics and mesocephalics, and that the wide, flat euryprosopic facial pattern of brachycephalics lends itself to mandibular or bimaxillary protrusion and a Class III tendency.

Other investigators link craniofacial morphology to occlusion. Lavelle,[35] using the cephalic index, demonstrated that dolichocephalics are retrognathic and exhibit an Angle Class II molar relationship, while brachycephalics exhibit "relative maxillary retrusion and forward mandibular placement" giving a prognathic profile and an Angle Class III molar relationship. Anderson and Popovich[36] looked at a sample drawn from the Burlington Growth Center records, and contrasted 10% of boys and girls with the most open cranial base angles with 10% possessing the most closed cranial base angles at ages 4, 8, 12 and 16 years. The results of their study indicated that those subjects with flatter cranial bases possessed condyles that were located further backward and upward, and 45% more frequently possessed an Angle Class II malocclusion. These findings agree with several others.[5,35,37,38,39] However, Anderson and Popovich's[36] findings contradict previous works of Enlow and others[38,40,41] and Lavelle and others;[35,39] Anderson and Popovich did not find a Class III occlusion in those subjects with the closed cranial base flexure.

Anderson and Popovich,[42] in 1989, found a Class I occlusion more often when cranial base and mandibular angles correlate with posterior cranial base length and stature. However, when the angles correlate with each other, the occlusion is Class II.

A longitudinal study by Kerr and Hirst[43] followed 85 children enrolled in the Bellfast Growth Study in order to evaluate the validity of facial type characteristics as identifiers of malocclusion. Their findings showed the majority of children had craniofacial characteristics that were compatible indicators of their occlusal type. At 15 years of age only 8% of the sample subjects had an occlusion that was not consistent with their craniofacial characteristics.

Keeling et al[44] studied the association between craniofacial morphology and occlusion and found occlusion to be poorly associated with individual skeletal measures and that a malocclusion severity index was not indicative of the craniofacial morphology. These findings related somewhat to Bittner and Pancherz,[45] who concluded that "sagittal and vertical dental and skeletal intermaxillary relationships were only partly reflected in the face." Siriwat and Jarabak[46] found a neutral growth pattern in Class I and II division 1 malocclusions. A Class II division 2 and a Class III malocclusion possessed a hypodivergent growth pattern or upward and forward mandibular rotation with decreased anterior facial height.

Statement of Purpose

The purpose of this investigation was to determine whether a relationship existed between bruxism and craniofacial morphology and dental occlusion.

Materials and methods

Procedure and Design

A cross-sectional, retrospective study was conducted using bruxist and non-bruxist subjects. The subjects were characterized based upon answers to several questions related to their, or their families', awareness of their teeth clenching or grinding. A clinical examination of signs and symptoms of bruxing was also important. The subjects' head and facial measurements were recorded using anthropologic spreading calipers (Seritex, #106, Carlstadt, NJ). Cephalic, facial and gonial indices were calculated based upon Montagu[47] and Farkas.[48] The subjects' Angle dental occlusions were determined from an intra-oral examination.

Sample

Thirty-five (35) bruxers were selected based upon subjective and objective evaluations. The subjective evaluation involved the subjects answering affirmative to the question, "Do you or have you

Table 1
Comparison of craniofacial index values between bruxers and non-bruxers

Craniofacial Indices	Bruxers(N=35)		Non-Bruxers (N=28)			Significants
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	F-Value	($p \leq 0.05$)
Cephalic	75.24	2.78	74.01	3.60	2.34855	N.S.
Facial	81.48	5.29	82.65	6.27	0.64915	N.S.
Gonial	77.13	4.34	78.46	5.17	1.22417	N.S.

($T^2 = 0.062$; p = 0.31)

Table 2
Comparison of the number of subjects with the various headforms between bruxers and non-bruxers

	Headforms				
	Hyperdolichocepalic	Dolichocephalic	Mesocephalic	Brachycephalic	Total
Bruxers	5	19	10	1	35
Non-bruxers	6	14	7	1	28
Total	11	33	17	2	63

Chi Square = 0.60762 (3 d.f.)
Non-significant (p = 0.89)

been told that you clench or grind your teeth?" The objective exam consisted of checking for signs of bruxism, e.g., wear faceting of the teeth. For this study, bruxism was defined as the grinding or clenching of the teeth at times other than for the mastication of food. The criteria used for selection of the bruxist subjects included: 1) permanent dentition; 2) at least 22 teeth present; 3) Caucasian; 4) ages 13 to 55 years; 5) reported history of bruxism; 6) wear faceting of at least two teeth.

A comparison group of 28 non-bruxers was selected concurrently with the bruxist sample. The non-bruxist sample matched the bruxist sample by age and gender. The non-bruxist sample was selected based upon the subjects answering "no" to all inquiries regarding clenching or grinding their teeth, as well as, an intra-oral examination that ruled out obvious signs of bruxing.

Craniofacial Measurements

Anthropometric measurements and indices were used in this study. Measurements of the skull and face were recorded using spreading calipers with subjects in a seated position and looking straight ahead, which allowed the plane of vision to closely approximate the Frankfort Horizontal Plane.[47] Classification of headform and facial type was based upon index values of Farkas and Munro.[48] The Farkas and Munro[48] standards were derived from a study of 2,564 North American children and adults over a 10-year period.

Prior to the study, an independent examiner and the principal investigator performed interjudge reliability for head and facial measurements on a sample of 10 subjects not used in the study. Measurements were repeated on the same 10 subjects one week later and paired t-tests were then performed.

1. Cephalic Index

The Cephalic Index was calculated using the formula:

$$\text{Cephalic Index} = \frac{\text{Maximum head breadth}}{\text{Maximum head length}} \times 100$$

Maximum head length was determined by mea-

Table 3
Comparison of the number of subjects with the various facial types between bruxers and non-bruxers

	Facial Types				
	Hypereuryprosopic	Euryprosopic	Mesoprosopic	Leptoprosopic	Total
Bruxers	8	10	12	5	35
Non-bruxers	6	11	4	7	28
Total	14	21	16	12	63

Chi Square = 3.93750 (3 d.f.)
Non-significant (p = 0.27)

Table 4
Comparison of the number of subjects with the various Angle classifications between bruxers and non-bruxers

	Angle Classification			
	Class I	Class II	Class III	Total
Bruxers	18	12	5	35
Non-Bruxers	18	6	4	28
Total	36	18	9	63

Chi-Square = 1.35000 (2 d.f.)
Non-significant (p = 0.51)

suring the distance between glabella and opisthocranion (farthest projecting point of the midsagittal plane on the back of the head). Maximum head breadth was measured at euryon, i.e., the greatest transverse diameter of the head at the most lateral projecting point over each parietal bone. Headform was determined based upon Farkas and Munro[48].

2. Facial Index

The Facial Index was calculated using the formula:

$$\text{Facial Index} = \frac{\text{Na-Gnathion Height}}{\text{Bizygomatic breadth}} \times 100$$

Nasion was designated as the soft tissue point at which the most anterior point of the frontonasal sutures intersect the midsagittal plane, with the subject looking straight ahead. Gnathion was located as the lowest median point on the lower border of the mandible. Bizygomatic breadth was designated by the distance between the most laterally situated points on the zygomatic arches. Facial type was determined by the use of the Farkas and Munro[48] standards.

3. Gonial Index

The Gonial Index was calculated using the formula:

$$\text{Gonial Index} = \frac{\text{Go-Go}}{\text{Zy-Zy}} \times 100$$

The gonial index was developed for this study based upon the general formula for an anthropometric index:[47]

$$\text{Index} = \frac{\text{smaller measurement}}{\text{larger measurement}} \times 100$$

Bi-gonial width was evaluated relative to bizygomatic width. Since the "gonial index" was created for this study, there are no standardized index values. However, the larger the index value number (i.e., toward 100), the more "square" the face.

Dental Occlusion

Angle classification was determined intra-orally for all subjects.

Table 5
Comparison of facial type and Angle classification among bruxers

	Facial Types				
Angle Class	Hypereuryprosopic	Euryprosopic	Mesoprosopic	Leptoprosopic	Total
Class I	6	5	5	2	18
Class II	2	4	4	2	12
Class III	-	1	3	1	5
Total	8	10	12	5	35

Chi-Square = 3.91481 (6 d.f.)
Non-significant (p = 0.69)

Table 6
Comparison of facial type and Angle classification among non-bruxers

	Facial Types				
Angle Class	Hypereuryprosopic	Euryprosopic	Mesoprosopic	Leptoprosopic	Total
Class I	4	7	3	4	18
Class II	1	3	1	1	6
Class III	1	1	-	2	4
Total	6	11	4	7	28

Chi-Square = 2.36532 (6 d.f.)
Non-significant (p = 0.88)

Statistical Analyses

Reliability determination was made using paired t-tests and correlation coefficients. Chi-square tests, univariate and multivariate analyses of variance were used to determine the difference between bruxers and non-bruxers for craniofacial and dental measurements.

Results

Reliability

Paired t-tests demonstrated no interjudge differences for any of the measurements. Furthermore, all correlation coefficients were $\geq$ 0.903.

Number of Teeth

The average number of teeth in the bruxist group was 27.3, with a range of 24-31 teeth. The average number of teeth in the non-bruxist group was 27.1 with a range of 22-32 teeth.

Wear Facets

There were significantly more wear facets in the bruxist group versus the non-bruxist group (t = 3.54, p = 0.001). For the bruxist group, 100% of subjects exhibited wear faceting ($\bar{x}$ = 8.5), while for the non-bruxist group, only 39.3% (11 of 28) had faceting ($\bar{x}$ = 3.4).

Faceting versus Craniofacial Indices

Because both the bruxist and non-bruxist samples possessed wear facets, it was important to establish whether or not the bruxist and non-bruxist groups were sufficiently differentiated. The non-bruxers with wear facets were compared with those without wear facets in regard to their cephalic, facial, and gonial indices. The results indicate no statistically significant difference between the non-bruxers with wear facets and the non-bruxers without wear facets. The means and standard deviations for the non-bruxers without facets were: cephalic index 72.87 $\pm$ 2.97; facial index 83.81 $\pm$ 5.90; gonial index 78.44 $\pm$ 5.10. The means and standard deviations for the non-bruxers with facets were: cephalic index 75.77 $\pm$ 3.88; facial index 80.87 $\pm$ 6.70; gonial index 78.49 $\pm$ 5.53. These values had a Hotellings T^2 value of 0.20391 and were not statistically significant.

Table 7
Comparison of headform and Angle classification among bruxers

	Headforms				
Angle Class	Hyperdolichocephalic	Dolichocephalic	Mesocephalic	Brachycephalic	Total
Class I	3	9	5	1	18
Class II	1	7	4	–	12
Class III	1	3	1	–	5
Total	5	19	10	1	35

Chi-Square = 1.78275 (6 d.f.)
Non-significant (p = 0.94)

Table 8
Comparison of headform and Angle classification among non-bruxers

	Headforms				
Angle Class	Hyperdolichocephalic	Dolichocephalic	Mesocephalic	Brachycephalic	Total
Class I	4	10	3	1	18
Class II	–	4	2	-	6
Class III	2	–	2	–	4
Total	6	14	7	1	28

Chi-Square = 7.48148 (6 d.f.)
Non-significant (p = 0.28)

Craniofacial Indices

The mean cephalic, facial and gonial indices for all subjects were 74.69, 82.00, 77.72, respectively (Table 1). The mean cephalic index for the 35 bruxers was 75.24 and for the 28 non-bruxers was 74.01. The mean facial index for the bruxers was 81.48 and for the non-bruxers was 82.65. The gonial index for the bruxers was 77.13 and was 78.46 for the non-bruxers. There were no significant differences in any of the above craniofacial index values between bruxers and non-bruxers (Table 1).

Headform

For the 35 bruxers the headform types were: 5 hyperdolichocephalics, 19 dolichocephalics, 10 mesocephalics, and 1 brachycephalic (Table 2). For the 28 non-bruxers, the headform types were: 6 hyperdolichocephalics, 14 dolichocephalics, 7 mesocephalics, and 1 brachycephalic (Table 2). The dolichocephalic (including hyperdolichocephalic) headform was the most common type for bruxers (i.e., 24 of 35) and non-bruxers (i.e., 20 of 28). Overall, 44 of the 63 subjects were dolichocephalic or hyperdolichocephalic. However, there was no statistically significant difference (Chi-square, p = 0.89) between the headforms of bruxers versus non-bruxers (Table 2).

Facial Type

There was no significant difference between the facial types of bruxers and non-bruxers (Chi-square = 3.93750; p = 0.27)(Table 3). The most common facial type for bruxers was euryprosopic (including hypereuryprosopic) (i.e., 18 of 35 subjects); for non-bruxers it was also euryprosopic (i.e., 17 of 28 subjects). The predominant facial type overall was euryprosopic, with 35 of 63 subjects having this facial type.

Angle Occlusion

The bruxist group consisted of 18 subjects with an Angle's Class I malocclusion, 12 subjects with an Angle's Class II malocclusion, and 5 subjects with an Angle's Class III malocclusion. The non-bruxist group showed 18 subjects to be Class I, 6 subjects were a Class II, and 4 subjects were Class III. There was no statistically significant difference between the bruxist and non-bruxist groups with regard to Angle's classification (Chi-square = 1.3500; p = 0.51) (Table 4).

Facial Type versus Angle Occlusion

There was no statistically significant difference between facial types for any of the three occlusal categories for the bruxist group (Chi-Square = 3.91481; p = 0.69) (Table 5). The euryprosopic (including hypereuryprosopic) face was seen most often for Class I bruxers, 11 out of 18. For Class II bruxers, the euryprosopic (including hypereuryprosopic) face predominated in 6 out of 12 subjects. The Class III bruxer exhibited mostly the mesoprosopic face, 3 out of 5 (Table 5).

There was also no statistically significant difference between the facial types for any particular Angle's classification of occlusion in the non-bruxist comparison group (Chi-square = 2.36532; p = 0.88) (Table 6). The Class I group of non-bruxers possessed the euryprosopic (including hypereuryprosopic) facial type in 11 of 18 subjects. The Class II non-bruxers also were euryprosopic, in 4 of 6 subjects. The Class III non-bruxers were split between the euryprosopic and leptoprosopic facial types with 2 of 4 subjects in each group (Table 6).

There was no statistically significant difference between the headforms for any of the three occlusal categories within the bruxist group (Chi-square = 1.78275; p = 0.94)(Table 7). The headform occurring most often for the Class I bruxers was the dolichocephalic (including hyperdolichocephalic), in 12 of 18 subjects. For Class II bruxers, the dolichocephalic headform predominated, i.e., 8 of 12 subjects. The dolichocephalic headform was also the most frequent in Class II bruxers, 4 out of 5 (Table 7).

There was no statistically significant difference between headform and occlusion for non-bruxers (Chi-square = 7.418148; p = 0.28)(Table 8). The Class I non-bruxers had a dolichocephalic (including hyperdolichocephalic) headform in 14 of 18 subjects. The Class II non-bruxers also had a dolichocephalic headform in 4 of 6 cases. The Class III non-bruxers were split between hyperdolichocephalic and mesocephalic, with 2 subjects in each group (Table 8).

Discussion

Craniofacial Morphology and Bruxism

This investigation did not demonstrate significant differences in the head and/or facial forms of bruxers and non-bruxers. This disagrees with studies which contend that parafunctional hyperactivity of the masseter and associated muscles induce adaptive changes in dentofacial morphology.[9,11] Glaros and Rao[11] make reference to bruxism as being the primary cause of masseter hypertrophy. Subjects in their study also showed small gonial angles which they hypothesized to be a functional adaptation to increased mechanical stress on the masseter muscle insertion.

This investigation also failed to find a significant relationship between occlusion and facial morphology. This tends to support the findings of Keeling et al, [44] and Bittner and Pancherz,[45] who also failed to find a relationship between these two variables. However, this is in contrast with studies by Enlow et al [32,38,49] and Martone et al, [33] who found a significant relationship between headform (and facial pattern) and malocclusion. Also, Bhat and Enlow[31] found dolichocephalics and mesocephalics to possess a leptoprosopic facial type and Class II tendency. The conflicting findings of the above studies could be due to the differences in samples.

Interestingly, the results of this investigation did not demonstrate an association between headform and facial type. As previously stated in the review of the literature, the dolichocephalic (long) headform was found to be associated with the leptoprosopic (long) face, and the brachycephalic (short) headform associated with the euryprosopic (short) face[5]. The results of this study found the dolichocephalic headform frequently associated with the euryprosopic facial type. The dolichocephalic headform and euryprosopic facial type predominated for both bruxist and non-bruxist groups. One possible explanation may be that the bruxist and non-bruxist groups were not sufficiently differentiated. Another could be that the variable of race/ethnicity of this study superceded and "over-rid" any potential effect(s) of bruxism.

Dental Occlusion and Bruxism

The bruxers and non-bruxers did not differ significantly with regard to occlusion. The Class I occlusion was seen most frequently in both groups. Therefore, bruxism was not shown to be associated with any particular Angle's occlusion type. However, this study solely looked at molar occlusion, and did not address such variables as over jet, over bite, functional occlusion type, etc.

"Faceting" and Bruxism

Nearly 40% of the non-bruxist group exhibited wear faceting without indicating a bruxing habit. But, there are other causes of wear faceting besides bruxism, such as attrition from an abrasive diet. Perhaps, this is one explanation for the modestly large number of non-bruxers presenting with wear facets. However, another explanation could be that the non-bruxers were unaware and/or denied their bruxism. Attanasio[50] reported the prevalence of bruxism to be 15%-90% in adult populations and 7%-88% in children, however, he reports that only 5% to 20% of the population were aware they brux.

Implications

The lack of finding a significant association between dentofacial morphology and bruxism implies that the etiology of bruxism may not be "structurally" related. By a process of elimination, this would lend credence to the hypothesis that bruxism is of emotional origin and/or a central nervous system phenomenon, rather than due to "form".

Conclusions

1. There was no statistically significant difference in the craniofacial or dental morphology of bruxers versus non-bruxers.
2. The dolichocephalic headform and the euryprosopic facial type and Angle Class I occlusion predominated in both bruxers and non-bruxers.
3. There was no relationship between headform/facial type and dental occlusion.

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Author Address

Dr. Donald J. Rinchuse
University of Pittsburgh
School of Dental Medicine
Salk Hall - 3rd Floor
3501 Terrace Street
Pittsburgh, PA 15261

S.E. Menapace was formerly a Graduate Orthodontic Resident, University of Pittsburgh, School of Dental Medicine.

D.J. Rinchuse is an Associate Professor of Orthodontics, University of Pittsburgh, School of Dental Medicine

T. Zullo is Professor and Director of the Department of Learning Resources, University of Pittsburgh, School of Dental Medicine

C.J. Pierce is an Assistant Professor of Behavioral Science, University of Pittsburgh School of Dental Medicine.

H. Shnorhokian is an Associate Professor of Orthodontics, University of Pittsburgh School of Dental Medicine

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