

STUDY OF TOOTH WEAR IN CANINE GUIDANCE VERSUS GROUP FUNCTION OCCLUSION

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ABSTRACT

Objective: The objective of this study was to determine tooth wear in canine guidance and group function occlusion in both genders.

Material and Method: A cross sectional descriptive study with sample size of 84 having 42 in each gender was conducted at OPD of Sardar Begum Dental College Peshawar from February 2013 to March 2014. Patients of both genders having all permanent teeth present except third molar were included in the study. Patient's age, gender and occlusion type (canine guidance or group function) were recorded. All posterior teeth wear were graded according to Eccles and Jenkins index.

Results: Mean age of patients was 23.9 ± 3.27 years. Twenty seven (32.1%) patients were reported with no wear and 57 (67.9%) were observed with tooth wear. Patients having canine guidance occlusion were 53 (63.1%) and group function were observed in 31 (36.9%). Tooth wear in group function was reported in 53% and 15% in canine guidance. Canine guided occlusion was common in both males and females as compared to group function.

Conclusions: This study revealed that group function occlusion is more prone to tooth wear and the observed population has more frequency of canine guidance occlusion.

Key words: Canine guidance occlusion, Group function occlusion, tooth wear

INTRODUCTION

Dental occlusion has been an essential part for all dental works in restorative dentistry. Dental treatment has the ability to alter static and dynamic occlusal relationships, while trying to accomplish as near ideal occlusion as possible. For dynamic occlusal relationships, there are three main concepts regarding tooth contact during the lateral excursion of mandibular movement i.e. balanced occlusion, canine guidance and group function¹.

Every restoration, whether a simple amalgam filling or complex crown and bridgework, that involves the occlusal surface will affect the occlusion. Therefore restorations occlusal scheme should be planned so that they do not exceed the adaptive tolerance of stomatognathic system².

Sensitivity, reliability, and validity of various methods used to assess occlusal contacts is a serious concern as inconsistent examination methods can show conflicting role of occlusal contacts in temporomandibular disorders, bruxism, and periodontal disease³.

As age increases canine guidance is replaced by group function due to wear of the canines. This change causes increase in wear in the posterior region⁴.

Tooth erosion and other tooth wears can be assessed from tooth wear indices (TWI) like Eccles index, Lussi index, Smith and Knight index, Simplified scoring criteria and basic erosive wear examination⁵.

Data related to canine guided and group function occlusion wear is rare in literature. So the aim of current study was to find the severity of tooth wear in different occlusal schemes and compare current results with international statistics.

METHODS AND MATERIALS

This cross sectional descriptive study with sample size 84 was conducted at OPD at Sardar Begum Dental

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College, Peshawar. Patients who had all permanent teeth present except 3th molar of both genders were examined for occlusion and wear assessment. During examination mandible was moved laterally to working side only. Canine to canine contact was checked. Same was repeated for the other side. If any posterior tooth contact in addition to canine contact occurred on working side and no contact of teeth on balancing side then it was considered as group function occlusion. When posterior contact occurred neither on working side nor on balancing side and only canine to canine contact was observed, then it was noted as canine guided occlusion. After assessing occlusion the posterior teeth were examined for tooth wear. Tooth wear if present were graded according to Eccles and Jenkins index (Grade 0 “Normal surface, without enamel wear”, Grade 1 “Surface with enamel wear, but without dentin wear”, Grade 2 “Surface with dentin wear, less than 1/3 of the surface” and the highest severity, grade 3 “Surface with dentin wear, more than 1/3 of the surface). Patients having carious, restored and fractured teeth were excluded.

Mean \pm Standard Deviation were calculated for numerical variables like age, Frequencies and percentages were calculated for categorical variables like gender and occlusion. The data were analyzed on SPSS version 17.

RESULTS

The mean age of patients was 23.9 ± 3.27 years. No wear were reported in 27(32.1%) patients and 57(67.9%) patients were observed with tooth wear is shown in Table-1.

Most common occlusion was canine guided 53(63.1%). Common occlusion in both genders was also canine guidance as shown in Table-2.

Most common grade of tooth wear in both canine guidance and group function occlusion was grade -1. No patient was reported with grade-3 wear. Most common wear in canine guidance was observed in lower left first molar (32%) while in group function

Table-1: Distribution of patient gender with tooth wear.

Gender	No wear		Wear present	
	n	%	n	%
Male	13	15.47	29	34.52
Female	14	16.66	28	33.33
Total	27	32.13	57	67.85

Table-2: Distribution of gender with occlusion

Gender	Canine guidance		Group function	
	n	%	n	%
Male	27	32.1	15	17.9
Female	26	31.0	16	19.0
Total	53	63.1	31	36.9

Table-3: Distribution of grades of teeth in canine guidance and group function occlusion

Teeth	Canine guidance				Group function				Total
	No wear	Grade 1	Grade 2	%	No wear	Grade 1	Grade 2	%	
Upper left 4	48	5	0	9.4	20	11	0	35.4	84
Upper left 5	48	5	0	9.4	20	9	2	35.4	84
Upper left 6	43	10	0	18.8	14	13	4	54.8	84
Upper left 7	43	10	0	18.8	12	13	6	61.2	84
Lower left 4	47	5	1	11.3	15	14	2	51.6	84
Lower left 5	48	4	1	9.4	16	14	1	48.3	84
Lower left 6	36	17	0	32	11	13	7	64.5	84
Lower left 7	43	10	0	18.8	11	15	5	64.5	84
Upper right 4	46	7	0	13.2	18	13	0	41.9	84
Upper right 5	48	5	0	9.4	18	12	1	41.9	84
Upper right 6	47	5	1	11.3	15	12	4	51.6	84
Upper right 7	46	6	1	13.2	13	14	3	54.8	84
Lower right 4	47	5	1	11.3	13	15	3	58	84
Lower right 5	44	9	0	16.9	12	15	4	61.2	84
Lower right 6	46	7	0	13.2	14	13	4	54.8	84
Lower right 7	45	8	0	15	13	14	4	58	84

Table-4: Distribution of grades of teeth with gender

Teeth	Male				Female				Total
	No wear	Grade 1	Grade 2	%	No wear	Grade 1	Grade 2	%	
Upper left 4	31	11	0	26.1	37	5	0	11.9	84
Upper left 5	31	9	2	26.1	37	5	0	11.9	84
Upper left 6	25	13	4	40.4	32	10	0	23.8	84
Upper left 7	25	12	5	40.4	30	11	1	28.5	84
Lower left 4	29	13	0	30.9	33	16	3	45.2	84
Lower left 5	29	13	0	30.9	35	5	2	16.6	84
Lower left 6	23	14	5	45.2	24	16	2	42.8	84
Lower left 7	26	12	4	38	28	13	1	33.3	84
Upper right 4	29	13	0	30.9	35	7	0	16.6	84
Upper right 5	29	12	1	30.9	37	5	0	11.9	84
Upper right 6	28	9	5	33.3	34	8	0	19	84
Upper right 7	28	10	4	33.3	31	10	1	26.1	84
Lower right 4	28	13	1	33.3	32	7	3	23.8	84
Lower right 5	29	11	2	30.9	27	13	2	35.7	84
Lower right 6	29	10	3	30.9	31	10	1	26.1	84
Lower right 7	26	12	4	38	32	10	0	23.8	84

the most common wear was observed in lower left second molar and lower left first molar (64.5% each). In both canine guidance and group function least common wear were observed in upper left first premolar and upper left second premolar. The details are given in Table-3.

In males most common grade-1 wear was observed in lower left first molar and in females the most common grade-1 wear was notice in lower left first pre-molar followed by lower left first molar. Least wear in males was reported in upper left first premolar and upper left second premolar. In females least wear was in lower left first premolar and lower left first molar as shown in Table-4.

DISCUSSION

The distribution of occlusal schemes varies in different population⁶. Weinberg found that 81% of his studied population possessed group function occlusal scheme, whereas only 5% had canine guided occlusal scheme⁷. By contrast, Scaife and Holt examined 1200 individuals, and reported that the majority had either unilateral or bilateral canine protected occlusion⁸. In the current study canine guidance was 63.1% and group function was 36.9%. The discrepancy among other and current studies may be due to the difference in examined population, culture and food intakes, difference in sample size as well as influence

of the materials used to register the contacts. As the age increases, canine wears down and occlusion gets transformed into group function but in current study there is more percentage of canine guidance^{9,10}. The reason being the sample age was ranging from 17 to 33 years. This was not the intention of the author. The inclusion criteria were full complement of teeth except third molar. When patients were selected with these criteria the sample of 84 patients was found to be young patients. And this explains why canine guidance was more in current study. And this explains why the result contradicts with other studies.

In current study most of tooth wear were reported in group function (53%) as compared to canine guidance (15%). These findings correlate with the study of Sandra et al¹¹ and Buttler et al¹² in which tooth wear in canine guidance among 38.5% patients and in group function among 61.5% patients was reported. This is due to the fact that canine guidance reduces the lateral tooth contact and possibility of interfering contacts¹³.

According to Sandra et al¹¹ most of the tooth wear in canine guidance was reported in lower first premolar (26.7%) and no wear in lower first and second molar. In group function most wear was reported in lower first premolar (32%) and no wear in lower second molar. But in the present study the results are different

from the study of Sundra et al¹¹. Most wear in canine guidance is reported in lower first molar (13.8%) and in group function also reported in lower first molar and second molar (7.6%) each. This difference is due to occurrence of interferences in different teeth, food intake, Age groups selected, occupational hazards and other wear types (attrition, erosion, abrasion) which varies in different population. Although some other studies^{14,15,16} are in agreement with the results of the present study.

CONCLUSIONS

From this study it is concluded that common occlusion is canine guidance in both genders. But tooth wear is mostly recorded in group function

RECOMMENDATIONS

1. Group function occlusion should be closely monitored for tooth wear because of having more lateral interferences.
2. Every effort should be made to prevent the conversion of canine guidance to group function by wear down of canines.

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