Body Position and Occlusal Contacts in Lateral Excursions: A Pilot Study

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This pilot study aimed to explore whether occlusal contacts during lateral excursions are influenced by tilted body positions. Occlusal contacts in lateral excursions were verified for 30 dental students and 22 dental staff members using articulation foil while patients were seated in a dental chair. The number and location of dynamic tooth contacts (initial and halfway) were registered with the back of the dental chair in three positions: upright, 45 degrees, and supine. For the majority of subjects (96%), dynamic occlusal contacts changed when the body position was altered. *Int J Prosthodont 2011;24:133–136.*

It is recognized that patients may indicate different perceptions of occlusal contacts with static and dynamic occlusion in an upright position compared to supine. However, to the authors' knowledge, hardly any scientific data are available on the appearance of occlusal contacts in different body positions. One study that investigated static occlusion was located, and it was observed that jaw closure in tilted body positions resulted in different initial occlusal contacts.[1]

Since data on dynamic occlusion are lacking, the aim of this pilot study was to explore if tooth contacts during lateral excursions are influenced by tilted body positions.

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Materials and Methods

A convenience sample of 30 students (22 to 34 years of age; 8 men, 22 women) and 22 faculty staff members (31 to 64 years of age; 11 men, 11 women) from the Radboud University Nijmegen Medical Centre, Nijmegen, The Netherlands, participated in this pilot study. All subjects had complete dentitions and were free of any signs or symptoms of temporomandibular disorder. While seated in a dental chair, subjects were instructed to perform a lateral excursion from maximal occlusion to the point where the canines were in an end-to-end position. Shim stock articulation foil, held by a pair of pincers, was used to check the presence of occlusal contact during lateral excursion (Fig 1). Working and nonworking side contacts were subsequently registered. Following the method of Ogawa et al,[2] occlusal contacts in the initial and terminal portions of the excursion were differentiated.

Registrations were performed for three separate body positions. For this purpose, the position of the back of the dental chair was altered so that the subjects' Frankfort plane was at different angles to the floor: horizontal (upright), 45 degrees, and vertical (supine) (Fig 2). The headrest supported the head in all positions to prevent unnecessary tension in the supra- and infrahyoid muscles.[3] One trained observer conducted the registrations. Intraobserver reliability was determined by re-examining 10 subjects (Cohen κ: 0.74).

Fig 1 Shim stock articulation foil was used to check the presence of occlusal contacts during lateral excursion.

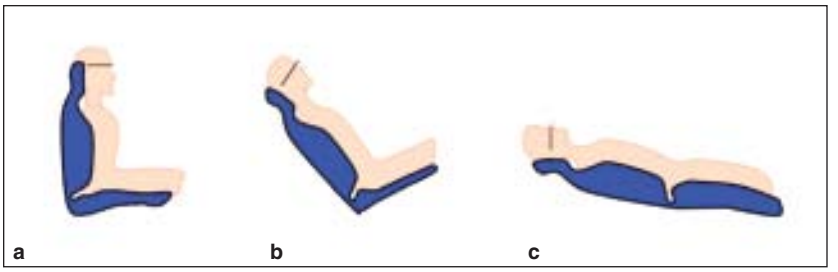

Fig 2 Registrations were taken with the dental chair in three positions: **(a)** upright (horizontal), **(b)** 45 degrees, and **(c)** supine (vertical). The line drawn represents the Frankfort plane.

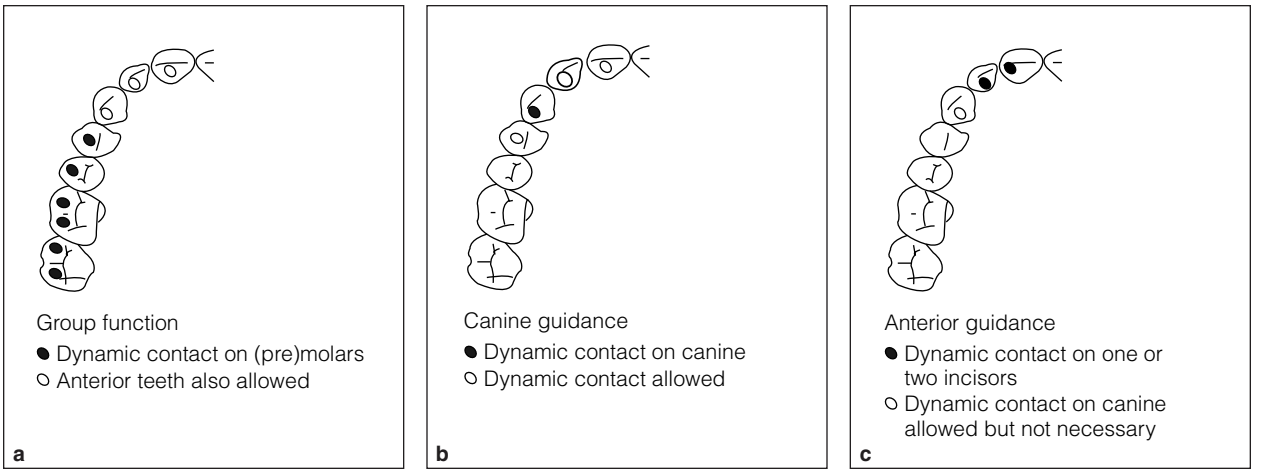

Fig 3 Criteria used to define the type of occlusal guidance during lateral excursion: **(a)** group function, **(b)** canine guidance, and **(c)** anterior guidance.

Frequencies of the changes in occlusal contacts resulting from tilting the body position were calculated. For each body position, the type of dynamic occlusion was registered and defined as canine guidance, anterior guidance, or group function (Fig 3). Deviating occlusal guidance schemes were shared among "other types of guidance."

Table 1 No. of Subjects (n = 52) with Canine Guidance, Anterior Guidance, Group Function, or Other Types of Guidance per Body Position

	Left side					Right side				
	Upright	When tilted to 45 degrees changed to:	45 degrees	When tilted to supine changed to:	Supine	Upright	When tilted to 45 degrees changed to:	45 degrees	When tilted to supine changed to:	Supine
CanG	27	AntG: 1 GroF: 2 OtherG: 1	26	AntG: 2 GroF: 2 OtherG: 0	22	20	AntG: 0 GroF: 1 OtherG: 0	23	AntG: 1 GroF: 2 OtherG: 0	21
AntG	6	CanG: 1 GroF: 0 OtherG: 0	9	CanG: 1 GroF: 2 OtherG: 0	7	5	CanG: 0 GroF: 1 OtherG: 0	5	CanG: 0 GroF: 0 OtherG: 0	6
GroF	18	CanG: 2 AntG: 2 OtherG: 0	15	CanG: 0 AntG: 0 OtherG: 0	20	26	CanG: 4 AntG: 1 OtherG: 0	23	CanG: 1 AntG: 0 OtherG: 1	23
OtherG	1	CanG: 0 AntG: 0 GroF: 0	2	CanG: 0 AntG: 0 GroF: 0	3	1	CanG: 0 AntG: 0 GroF: 0	1	CanG: 0 AntG: 0 GroF: 0	2
Total	52	9	52	7	52	52	7	52	5	52

CanG = canine guidance; AntG = anterior guidance; GroF = group function; OtherG = other types of guidance.

Table 2 No. of Dynamic Occlusal Contacts per Body Position

	Upright	45 degrees	Supine
Working side	219	216	225
Nonworking side	35	47	45
Total	254	263	270

Results

The majority of subjects had canine guidance (44%) or group function (40%) in the upright position (Table 1). Tilting the body position from vertical to horizontal did not show a specific change in the subjects' type of dynamic occlusion. For instance, two subjects with canine guidance in the upright position changed to group function and one changed to anterior guidance when moved to the 45 degrees position, while three subjects changed to canine guidance.

The number of changed tooth contacts per subject ranged from 0 to 22 (Table 2). Two subjects (4%) had no change in tooth contacts. Nearly 83% of subjects had 7 or more changes in tooth contacts on the working side, while 48% had 7 or more changes on the nonworking side (Table 3).

Table 3 No. of Subjects According to the No. of Changed Dynamic Occlusal Contacts on Working and Nonworking Sides

No. of changed occlusal contacts	Upright to 45 degrees	45 degrees to supine	Upright to supine	Changes from all positions
Working side				
0	3	2	2	2
1	2	2	1	0
2	9	12	6	1
3	9	9	11	0
4	14	13	12	0
5	5	4	7	2
6	5	4	7	4
≥ 7	5	6	6	43
Total	52	52	52	52
Nonworking side				
0	3	2	2	2
1	1	2	3	0
2	25	24	26	1
3	11	13	7	1
4	6	4	8	0
5	6	5	4	1
6	0	2	1	22
≥ 7	0	0	1	25
Total	52	52	52	52

Discussion

In the present study, the intraobserver agreement was good, indicating that the use of shim stock foil is valid.[4] However, the reliability of recordings of dynamic occlusion also depends on the accuracy and reproducibility of the repeated jaw movement, whereas consistent occlusal forces are very difficult to control and may vary each day.[5] Given a certain variation among subjects, the high κ value for agreement is likely to be an underestimation of the accuracy of the use of shim stock foil.

From the results, it appears that the frequency of changes in occlusal contact during lateral excursions resulting from altering the body position differs largely between subjects. Few subjects showed unchanged occlusal contacts, but structural changes in the type of occlusion from different body positions are not conceivable. Therefore, it is not clear whether recordings for extended occlusal rehabilitation should be performed in an upright or supine position. However, this pilot study illustrates that it is advisable to assess static and dynamic occlusion in more than one body position. This study describes a relationship between body position and the manner in which occlusal contacts are presented. It is unknown to what extent this might induce modified therapeutic occlusal adjustment protocols.

Conclusion

For the majority of subjects, the number of dynamic occlusal contacts changed when the body position was altered.

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Literature Abstract

Oral health self-care behaviors of rural older adults

Access to dental care is often limited in rural communities. In particular, limited access is magnified in those who have lower incomes and are members of minority groups. Without access to professional care, many such older adults engage in self-care. This cross-sectional study analyzes data from a comprehensive oral health survey conducted with a large, random, multiethnic sample of rural adults aged 60 years and older. Six hundred thirty-five residents of the 859 dwelling units completed the interview with a response rate of 73.9%. The results indicate that rural older adults engage in a variety of self-care behaviors, which may include over-the-counter (OTC) medicine (12.1%), OTC dental products (84.3%), prescription medicine, salt (51.0%), prayer (6.1%), and complimentary therapies (18.2%). Complementary therapies may include the use of teabags/herbs, hot/cold, placing aspirin on the affected area, massaging the gums, liquor, species, and rinsing the mouth with toxic substances. The most prevalent behavior is the use of OTC dental products, of which 77.9% involved the use of mouthwash, 28.2% involved hydrogen peroxide, and 21.6% involved denture products. Age, sex, ethnicity, and education have some association with these self-care behaviors. Older individuals and women have greater odds of using OTC medicine and salt. African-American and Native American individuals have higher odds of using OTC medicine and products. Those who did not complete high school have greater odds of using OTC medicine. Poverty status does not seem to be related to any of the self-care behaviors. Oral health problems had the most consistent patterns of association with self-care behaviors. In particular, those with oral pain, bad breath, and bleeding gums had greater odds of using OTC medicine, hydrogen peroxide, and salt, as well as OTC dental products and complementary therapies.

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