



**A COMPARATIVE EVALUATION OF THE EFFECT OF CHANGE IN
DENTAL CHAIR INCLINATION IN THE CENTRIC AND
ECCENTRIC OCCLUSAL CONTACTS BETWEEN PATIENTS WITH
AND WITHOUT CROWN PROSTHESIS.**

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GADE

ABSTRACT

Aim: To compare and evaluate of the effect of change in dental chair inclination in the centric and eccentric occlusal contacts between patients with and without crown prosthesis.

Objectives: 1. To evaluate the number of contacts in centric and eccentric occlusion in upright and recline position with and without crown prosthesis. 2. To compare the number of contacts in centric occlusion in upright and recline position with and without crown prosthesis. 3. To compare the number of contacts in eccentric occlusion in upright and recline position with and without crown prosthesis.

Materials and method: Twenty voluntary undergraduate students with a complete permanent dentition were included in the study. Out of 20 students; 10 with crown prosthesis and 10 without crown prosthesis. The chair was stabilized to check occlusal contacts at two inclinations: 90 degrees and 120 degrees. To record the occlusal contacts in centric and eccentric, (Bausch)12 μ articulating foil of two different colour was used. For each participant with and without crown prosthesis both the centric eccentric contacts at upright and recline position were recorded.

Result: There is no change in number of contacts at centric in patients without crown prosthesis, but there is a significant change of eccentric contacts at recline position. With crown prosthesis there is significant change of contacts in centric and eccentric occlusion. In patients with and without crown prosthesis at 120 degree there is a significant change in eccentric contacts.

Keywords: centric, eccentric, prosthesis.

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INTRODUCTION

Basic foundation of dentistry is occlusion. Occlusal therapy is of two types: reversible, example occlusal appliance and irreversible, example fixed prosthetic procedures and orthodontic appliance. For the following reasons permanent alteration of occlusion is indicated; the most common reason is to improve functional relationship between maxillary and mandibular teeth and to eliminate temporomandibular disorder. To achieve desired occlusal contact pattern selective grinding is one of the methods in which the occlusal surfaces of teeth is reshaped within the confines of enamel. If the occlusal contact is not achieved than restoration of the teeth either by crown or fixed dental prosthesis is the final treatment for restoring occlusion.

Anterior guidance can be classified into three schemes: canine protection, group function and balanced occlusion. According to GPT -9 canine protection is defined as a form of mutually protected articulation in which the vertical and horizontal overlap of the canine teeth disclude the posterior teeth in the excursive movements of the mandible. Group function: multiple contact relations between the maxillary and mandibular teeth in lateral movements on the working-side whereby simultaneous contact of several teeth acts as a group to distribute occlusal forces. Balanced occlusion: the bilateral, simultaneous occlusal contact of the anterior and posterior teeth in excursive movements.

Halperin et al stated that there are significant differences in the thickness, strength, and plastic deformation of the various articulating papers and occlusal registration strips. The patient's perception of occlusal thickness ranges from 12.5 to 100 μm . It is appropriate to advocate use of registration strips in the thickness range of 13 to 21 μm and to discourage use of registrations strips in the 49 to 122 μm range.¹

Coelho et al stated that on the basis of clinical observations that the inclination of the dental chair backrest might alter the distribution of occlusal contact points, it was hypothesized that a change in the inclination of the chair could lead to a different head inclination and consequently a different mandible position. It was concluded that variation in dental chair backrest inclination influenced mandibular position, most notably with a 180-degree position, suggesting that this position should be avoided. At a 120-degree inclination, no statistical differences in mandibular position were found.²

The purpose of present study was to evaluate the change in dental chair inclination in centric and eccentric position result in change of contacts between patients with and without crown prosthesis.

MATERIAL AND METHOD:

- Twenty voluntary undergraduate students with a complete permanent dentition were included in the study.
- Out of 20 students; 10 with crown

- prosthesis and 10 without crown prosthesis.
- **Inclusion criteria:** age between 18 to 25 years, complete permanent dentition except for third molars, sound periodontium and teeth without restorations.
- **Exclusion criteria:** no history of orthodontic therapy, tooth grinding, temporomandibular disorders, and tooth mobility.
- **MATERIALS**
- Shim Stock (12 μ thick;artifoil articulating film Dr. Jean Bausch, 50769 koln, Germany).
- Miller forcep
- Vernier caliper

- Red marker(camlin pen)

METHODOLOGY



Figure 1 shim stock articulating film(Bausch)

- 20 participants were divided into two groups according to inclusion criteria.
- Group A without crown prosthesis,
- Group B with crown prosthesis.
- Group A and B were further divided into centric and eccentric occlusion.

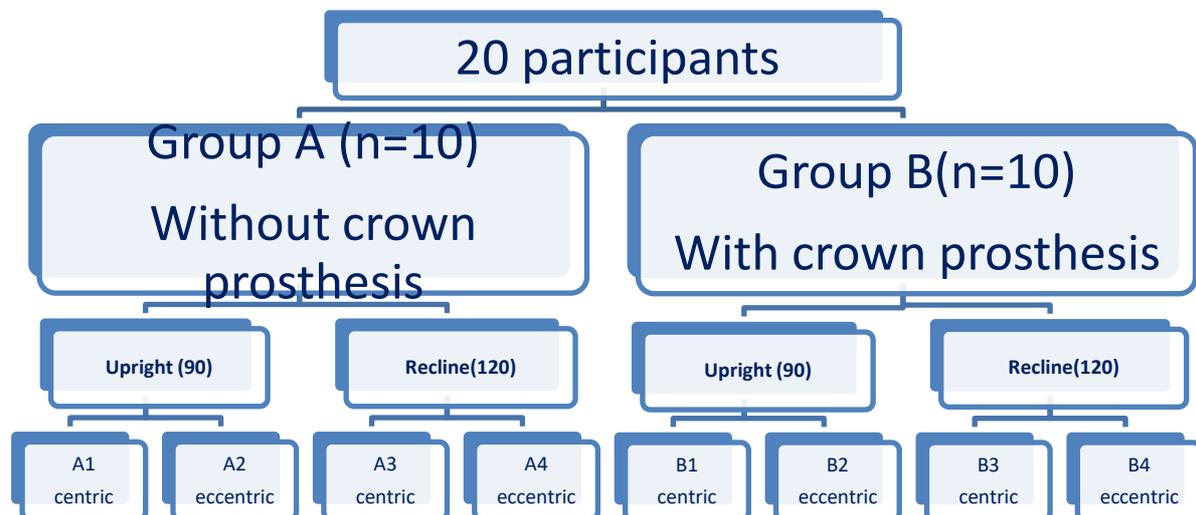


Figure 2 Study work flow

- To standardize the angles used in this study, a protractor was adapted and positioned on the axis connecting the chair's backrest to its seat.
- The chair was stabilized to check occlusal contacts at two inclinations: 90

- degrees (initial position, in which the occlusal plane was parallel to the horizontal plane), 120 degrees.
- To record the occlusal contacts, (Bausch) 12 μ articulating foil of two different colour was used.
- To standardize in excursion position 0.5 mm from dental midline was marked.
- For each participant with and without crown prosthesis both the centric eccentric contacts at upright and recline position were recorded.



Figure 3 centric contacts

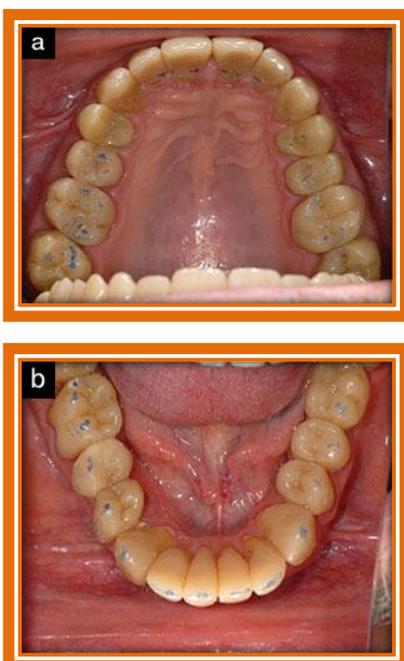


Figure 4 Eccentric contacts

RESULT

The median number of contacts in subjects without crown and with crown at upright and recline position were obtained for centric and eccentric occlusion types. In patients without crown, the median number of contacts for centric occlusion at upright position was 6, while at recline position was 7. The difference between the distributions of number of contacts between two positions was statistically insignificant as per Wilcoxon signed rank test. For eccentric occlusion type, the median at upright position was 5, while at recline position was 6. The difference between the medians was statistically significant with p-value of 0.0035.

Further, in patients with crown, the median number of contacts for centric occlusion type at upright position was 7, while at recline position was 8. The difference between the two medians was statistically significant with P-value of 0.0036. For eccentric occlusion type, the median number of contacts at upright position was 5, while at recline position was 7; and the difference was statistically significant with P-value of 0.0049.

Table 2 gives the number of contacts according to position for two occlusion types in two patient groups with and without crown. The difference of median number of contacts between groups at each occlusion type and position was determined using Wilcoxon rank sum test. Table shows that at recline

position, for eccentric occlusion type, the difference of number of contacts between subjects with and without crown was

statistically significant with P-value of 0.045. Rest other comparisons showed insignificant differences, as indicated by P-value > 0.05.

Table 1: Median number of contacts at different positions for two occlusion types in two study groups

Group: Without crown			P-value*	Group: With crown			P-
Median (Min, Max) number of contacts				Median (Min, Max) number of contacts			value*
Occlusion type	Position			Occlusion type	Position		
	Upright	Recline			Upright	Recline	
Centric	6 (3, 9)	7 (4, 9)	0.1373 (NS)	Centric	7 (4, 10)	8 (5, 11)	0.0036 (S)
Eccentric	5 (1, 6)	6 (2, 7)	0.0035 (S)	Eccentric	5 (4, 6)	7 (5, 7)	0.0049 (S)

NS: Not significant; S: Significant; *Obtained using Wilcoxon signed rank test

Table 2: Median number of contacts according to position for two occlusion types in patients with and without crown groups

Position: Upright			P-	Position: Recline			P-
Median (Min, Max) Contacts			value*	Median (Min, Max) Contacts			value*
Occlusion type	Group			Occlusion type	Group		
	Without crown	With crown			Without crown	With crown	
Centric	6 (3, 9)	7 (4, 10)	0.514	Centric	7 (4, 9)	8 (5, 11)	0.141
Eccentric	5 (1, 6)	5 (4, 6)	0.412	Eccentric	6 (2, 7)	7 (5, 7)	0.045

*Obtained using Wilcoxon rank sum test

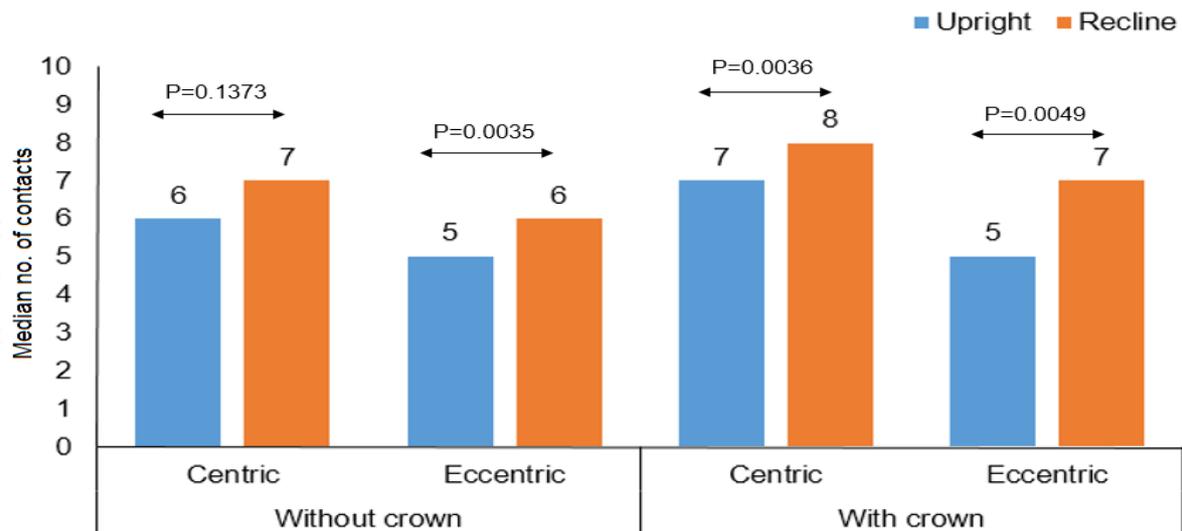


Figure 5 : Column chart showing median number of contacts at different positions for centric and eccentric occlusions in two study

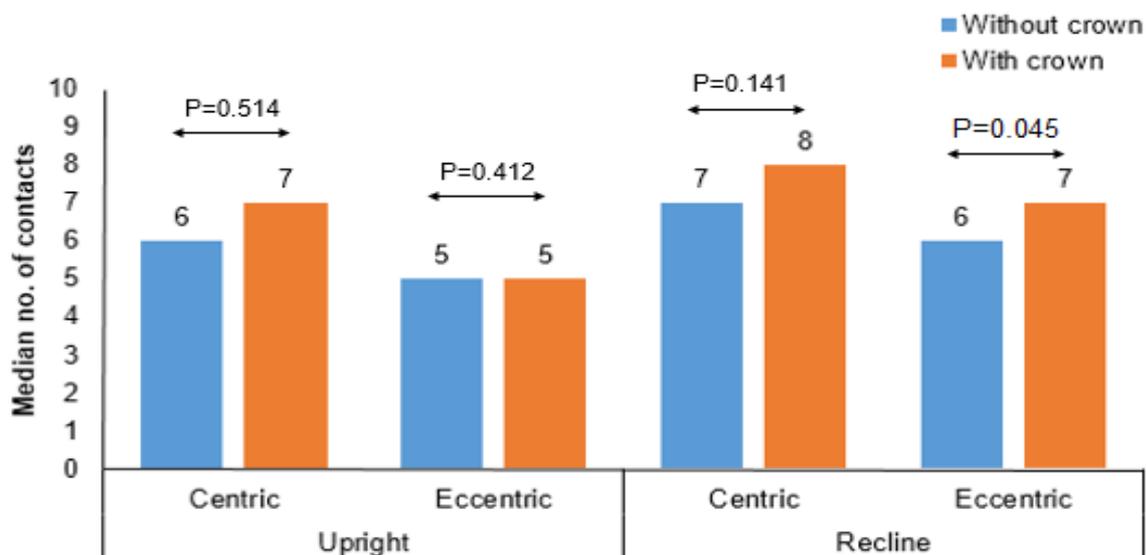


Figure 6: Column chart showing median number of contacts at for patients with and without crown for two occlusion types at upright and recline positions.

DISCUSSION

The present study shows that In patients without crown prosthesis for eccentric occlusion type in upright and recline position the difference between the medians was statistically significant with P-value of 0.0035. In patients with crown, for centric occlusion in upright and recline position the difference between the two medians was statistically

significant with P-value of 0.0036. In patients with crown, for eccentric occlusion type, in upright and recline position the difference was statistically significant with P-value of 0.0049. At recline position, for eccentric occlusion type, with and without crown

prosthesis the difference of number of contacts between subjects with and without crown was statistically significant with P-value of 0.045. According to Weinberg in 1964; the majority of subjects (81 per cent) revealed working side cuspal contact during lateral excursions. On the basis of this evidence, it can be concluded that most often the occlusal treatment objective should be the harmonious cuspal contact on the working side from the canines to the last molar teeth in lateral eccentric occlusions.³ Kinematical analyses by Ogawa et al suggested that occlusal gliding contact during mastication would occur in the 0.5 mm position and that the occlusion contact pattern in this position must be evaluated when investigating the role of occlusal contact on masticatory function. Therefore in this study occlusal contacts were examined in lateral position at 0.5mm.⁴ Electromyographic investigations support the relationship between the muscles attached to the mandible and the position of the head. These investigations document how inclinations of the head affected the mandibular postural position. Normally, no occlusal contact exists between the maxillary and mandibular teeth when the muscles are relaxed.^{5,6,7} When the resting vertical dimension is decreased, as clinically observed with a forward head posture, and encroaching the freeway space, the mandibular condyle may intrude up ward and backward in the glenoid fossa, the teeth may be in contact eliminating the rest position and creating tension on the muscles

of mastication and stress on the teeth and structures.^{8,9,10,11} There is an effect of gravity on a forward head posture which causes an increase in forward tension which induces fatigue and presents a compressive force on the soft tissues.¹²

CONCLUSION:

- According to the result of the study it can be concluded that :
 1. There is no change in number of contacts at centric in patients without crown prosthesis, but there is a significant change of eccentric contacts at recline position.
 2. With crown prosthesis there is significant change of contacts in centric and eccentric occlusion.
 3. In patients with and without crown prosthesis at 120 degree there is a significant change in eccentric contacts .

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