

Dimensional Change (by Temperature) for Different Type Interocclusal Recording Materials

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Abstract: Objective: This study aimed to compare the dimensional changes for different types of interocclusal recording materials (rubber base, zinc oxid, wax and soft curing acrylic) by temperature at room c⁰, 30c⁰, 15c and 0 c⁰. **Materials and Methods:** This is a comparative study in which 200 patients from each types of material were made in the stainless steel cyclic in shape.2min width and 1cm in length. Two elevated notches were made in the center of the inner surface of sample away from each other by 1cm .all sample were measured by micrometer caliper at different temperature. The collected data were analyzed by Statistical Package for Social Sciences (SPSS, version 20). **Results:** By analyzing the results, it was clear that; rubber base was the most stable material of all in different temperatures. Followed by zinc-oxide eugenol material, then the third material was soft wax and the last material was self-cure acrylic resin. The results are indicated that rubber base the best material followed by zinc oxid.

Conclusion: Soft wax and acrylic resin materials have the highest dimensional changes according to temperature changes. Rubber base and zinc-oxide eugenol showed no dimensional changes on temperature changes.

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1. Introduction

The attainment of management, in common, is influenced by numerous sides that are interrelated to the reliability of cast mounting on the articulator to convert jaw relation more perfect by the greatest nominated interocclusal record tools. In the prosthetic oral rehabilitation it is important that all steps of the procedure are conducted in a extremely careful method (1).

Centric relation (CR) is the straight connection typically used for impediment investigation, finding and recovery treatment, in light of the fact that it is a reproducible maxillo-mandibular connection critical to the solace, capacity and soundness of the stomatognathic framework (2).

Due the way that the CR is a decided position by the temporomandibular joint, it is crucial that no solid action meddles in the mandibular position and, thusly, all neuro-defender reflexes must be abstained from amid enlistment (3). The usage of interocclusal records is vital for the mounting of throws in CR on the grounds that this gives backing and security to these throws and permits connection without contact of occlusal surfaces (4,5). Acquiring precise maxillo-mandibular enrollments is basic for the proper connection of the throws. The clinical results rely on upon the precise proliferation of the interocclusal connection in the articulator from the season of analysis until the complete treatment. Therefore, the part of interocclusal enlistment in oral restoration is exceptionally important (6,7,8). To get an agreeable interocclusal enrollment, the materials must have the

accompanying attributes: low thickness, low imperviousness to mandibular shutting, no adherence to the teeth, pliancy, proper working time, unbending nature in the wake of setting, accuracy of points of interest, dimensional solidness, simple taking care of, adequacy to the patient, and minimal effort (9,10,11,12).

Four procedures for interocclusal enlistments of centric relation in light of materials or mixes of materials typically used were tried by method for throws for a patient with halfway lower edentulous, without a free finish weigh down (15, 16, 17). To guarantee the right position of driven connection a Lucia dance was used (18). The accompanying conditions for the record of back area were tried: enlistments with wax, wax in addition to zinc oxide-eugenol glue, wax in addition to Duralay acrylic tar, and buildup silicone (putty) (19,20). The assessment was made by the gauge of vertical separation between reference focuses in the base of the throws and figuring of varieties happening with every material. The blends of wax in addition to zinc oxide-eugenol glue and wax in addition to Duralay acrylic tar demonstrated the littlest varieties in driven connection position (21).

The impacts of temperature on the rheological features of current polyether and polysiloxane impression materials amid setting were studied and the conclusion has a definitive solidness or shear modeolus over the four temperature contrasted (21). In the present study, four routines for interocclusal enlistment of driven connection were thought about,

taking into account materials or blends of materials typically used: with wax, wax in addition to zinc oxide-eugenol glue, wax in addition to Duralay acrylic pitch, and buildup silicone (putty) (13,14).

The temperature impacts on the rheological properties of current polyether and polysiloxane impression materials amid setting were studied and the conclusion has a definitive firmness or shear modeolus over the four temperature varied (13, 14, 21). In the present study, four methods of interocclusal registration of driven connection were thought about, in view of materials or blends of materials normally used: with wax, wax in addition to zinc oxide-eugenol

glue, wax in addition to Duralay acrylic gum, and buildup silicone (putty).

2. Material and methods:

This is a comparative study. In this a study comparing the dimensional change in four type of interocclusal recording materials (rubber base, zinc oxid, wax and soft curing acrylic) by temperature at room c, 30c, 15cand zero c. 200 samples from each types of material were made in the stainless steel cyclic in shape.2min width and 1cm in length. Two elevated notches were made in the center of the inner surface of sample away from each other by 1cm .all sample were measured by micrometer caliper at different temperature.

3. Results:

Table (1): The effect of temperature change on dimensional stability of different types of interocclusal recording materials at room temperature, at 30oC, at 15oC, and at zero C

Interocclusal record material	At room temperature			At 30° C			At 15°C			At zero°C		
	mean	SD	dt	mean	SD	dt	mean	SD	dt	mean	SD	dt
Soft wax	3.06	0.175	A	3.02	0.170	B	1.900	0.160	A	1.700	0.150	A
Zinc-oxide eugenol	2.040	0.00	C	2.10	0.00	C	2.020	0.00	C	2.00	0.00	B
Rubber base	2.035	0.010	C	2.035	0.010	C	2.035	0.010	C	2.035	0.010	B
Self-cure acrylic resin	3.00	0.010	A	2.70	0.160	A	2.25	0.145	A	2.20	0.130	A

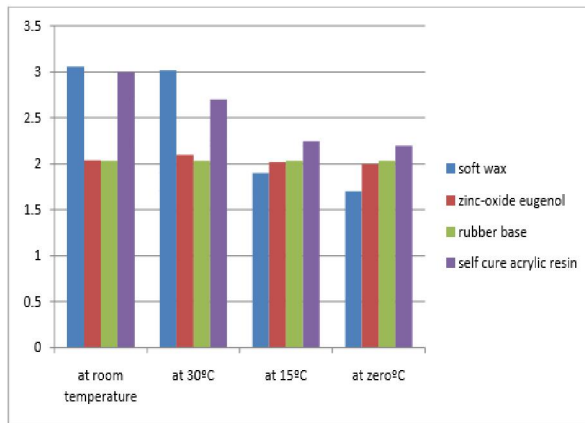


Figure (1): By analyzing the results, it was clear that; rubber base was the most stable material of all in different temperatures. Followed by zinc-oxide eugenol material, then the third material was soft wax and the last material was self cure acrylic resin.

4. Discussion:

In this study, the materials in the centric relation assessed on the grounds that this is the position of decision for analysis and arranging of oral restoration. The achievement of recovery treatment is nearly identified with a precise multiplication of occlusal connection in the articulator amid all phases of treatment. The conditions are absolutely subject to methodology and materials utilized for the interocclusal records which ought to result in the establishment of prosthetic reclamations, with a negligible occlusal alteration. The interocclusal

enlistments must be acquired with exceptional regard for the materials and producer's guidelines (4,5).

For a long time, and recently, the leaf gage, have been dependable to legitimately find and keep up the condyles in this position. Both keep up the minimum vertical separation expand important to wipe out dental contact (9,11). In this examination, was utilized on the grounds that it permitted obtention of an unbending and characterized halting point in the front locale, which guaranteed the CR position and permitted the assessment of enrollment materials utilized as a part of the back district of the curve amid estimation with the magnifying instrument.

As per Urstein et al. (17), elastomers are not inflexible materials, in this manner raising questions about the seating of the throws on the enrollments. This can explain the approach that silicone was significantly diverse contrasted with other materials. It is imperious to remind that there was no target to example the quality for seating of throws, on the floor that the objective was to repeat clinical practice, i.e. to smear sufficient weight for the throws to well-spoken appropriately, with the dance in position, without carrying out flexible misrepresentations in the material, as is typically done by the clinicians. In spite of the conclusion of a few agents that wax is unfavorable as a material for interocclusal enlistment (Millstein et al., 1971, 1973; Scott, 1978; Lassila and McCabe, 1985; Urstein et al., (8, 11, 12, 13, 17) it was measured on the grounds that it is the most utilized material in the dental facility, due to its simple taking

care of, clinical flexibility, simplicity of revisions and minimal effort.

In this study, the present adjustments of wax utility can be because of deficient weight connected to advance the right situating of the throws, without creating puncturing of wax sheets. Subsequently, it was confirmed that the wax additionally did not give security to the administrator as far as the weight that ought to be connected to give right cast connection. On this premise, the plastic or versatile distortions of wax and silicone were in charge of the higher varieties.

The strengths of this study include testing three methods for retention of complete dentures. The study limitations were; the study was conducted among 200 patients in Al-baha region; such studies will yield more useful results if conducted all over the country.

Conclusions:

1. Soft wax and acrylic resin materials have the highest dimensional changes according to temperature changes.
2. Rubber base and zinc-oxide eugenol showed no dimensional changes on temperature changes.
3. Rubber base and zinc-oxide were the best materials to record jaw relations as these materials were not changed on temperature change.

Competing on interest:

I declare that this study is one of my own works. It was not submitted to any other journal. I also declare that I have no competing interests related to this study.

Acknowledgement:

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