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A study evaluating the effect of border molding materials on complete denture retention

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Abstract

There are several materials available used for border molding and final impression as low fusing impression compound, addition silicone, polyether, autopolymerizing resin. The quality of the material used for border molding and wash impression affect the quality and the retention of the final prosthesis.

Purpose: This study was conducted to evaluate the effect of border molding material and wash impression material on the retention of complete denture.

Materials and Methods: Thirty patients were selected and randomly divided into three groups depending on the material used for border molding and final impression. A loop of 19 gauge SS wire was attached to the anterior palatal region of the denture bases fabricated from three groups of impressions. The retention of the denture bases was measured by pulling the denture base inserted in the mouth downward with force gauge. The data collected was subjected to ANOVA and student's t test to measure the intra and inter group comparisons.

Results: The mean retentive force of denture bases made under group I, II and III are 4.7 ± 0.72 , 5.61 ± 0.61 and 7.31 ± 0.83 respectively.

Conclusion: This study revealed that denture bases made with polyether are the most retentive.

Keywords: Polyether, border molding, retention

Introduction

The success of complete denture depends on the accuracy of the impression. The complete denture with proper retention and stability restore function, esthetics and esteem of the patient. The border molding is the shaping of the borders of the tray by the action and manipulation of the adjacent soft tissue to duplicate the contour and size of the vestibule. There are several materials available used in border molding as low fusing impression compound, addition silicone, polyether, autopolymerizing resin. The quality of border molding material affects the retention of the complete denture.

Aims and objectives

This study was conducted to evaluate the effect of border molding material on the retention of complete denture.

Materials and Methods

This study was conducted in the department of Prosthodontics, government dental college and hospital Srinagar from 2013 to 2016. Thirty patients seeking complete denture therapy were included in the study.

Inclusion criteria

- i. Age = 40 – 70 years
- ii. Normal and healthy mucosa
- iii. Class I frenum
- iv. Class I soft palate
- v. Atwood's order III ridge: High well rounded

Exclusion criteria

- i. Severe ridge resorption cases

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- ii. Fibrous ridge
- iii. Epulis fissuratum cases
- iv. Poor neuromotor control
- v. Scleroderma and Submucous fibrosis cases

For each patient, the primary impression was made in a suitably sized stock tray with impression compound. Primary cast was made in dental plaster from the impression made. Three identical trays with spacer were fabricated from the well outlined and relieved primary cast. The trays were randomly grouped depending on the material used for border molding and final impression

In group I, the low fusing impression compound was used for border molding and the zinc oxide eugenol for final impression.

In group II, putty consistency addition silicone was used for border molding and light body addition silicone for final impression.

In group III, polyether was used for border molding and final impression.

The heat cured acrylic denture bases were fabricated from the master cast made by pouring type III dental stone in the impression. A loop of 19 gauge SS wire was attached to the anterior palatal region of the denture bases. The retention of the denture bases was measured by pulling the denture base inserted in the mouth downward with force gauge. The data was collected and statistically analysed to evaluate the difference in the retention of denture bases. Mean value of retentive force with standard deviation was calculated and the data was subjected to ANOVA and student's t-test for intra and inter group comparisons respectively.

Results

The denture bases fabricated with group III method were the most retentive and those fabricated with group I the least retentive. The mean retentive force of denture bases made under group I, II and III are 4.7 ± 0.72 , 5.61 ± 0.61 and 7.31 ± 0.83 respectively. There was significant difference between the mean values of retentive force of group I versus group III and group II versus group III. But, there was no significant difference between the mean values of retentive force of group I versus group II.

Table 1: Mean value of retentive forces of different groups

	Mean(Kg)	SD	p-Value
Group I	4.71	0.72	<0.001
Group II	5.61	0.61	<0.001
Group III	7.31	0.83	0.001
Gr I vs Gr II			0.871
Gr I vs Gr III			<0.001
Gr II vs Gr III			0.001

Discussion

The present study revealed that denture bases made by using polyether are more retentive comparative to those made by using putty and light body of addition silicone and by using low fusing impression compound and zinc oxide eugenol.

Rizk conducted a study to compare the mean value of retention of complete denture and found that complete denture made by using putty and light rubber base were highly retentive comparative to that was made by using green stick compound with metallic oxide final wash.

Hikmat also concluded that the denture bases produced by full putty silicone tracing material and light body silicone final impression materials showed the higher mean values of

retentive forces than that of low fusing compound and metallic oxide impression paste.

Conclusion: Within the limitations of the study, it can be concluded that denture bases made by using poly ether for border molding and final impression were the most retentive. The denture bases made using modeling compound stick with zinc oxide eugenol impression paste final wash showed the lowest mean values of retention. The retention forces of all denture bases showed an acceptable retention for removable complete denture in clinical practice

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