

Analysis of Border Molding using Different Impression Techniques: A Clinical Study

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ABSTRACT

Background: The ability of complete denture to perform retention, stability and mastication makes a treatment successful. The present study was conducted to determine the retention force of impressions made by two different techniques.

Materials and methods: The present study was conducted in the department of Prosthodontics. It comprised of 8 patients of both genders. Patients were divided into 2 groups. Group I were those in which single step border molding technique was used and group II comprised of those patients in which sectional technique was used. Primary impression was taken with irreversible hydrocolloid. Two trays were made which were 2-3 mm short of the sulcus depth. Single step border molding with low fusing impression compound was used with first tray. With second tray, sectional border molding technique was done. The recording of the denture retentive force was carried out with digital force meter.

Results: Two techniques such as single step and incremental border molding technique was used. Out of 8 patients, males were 5 and females were 3. The difference was significant ($P < 0.01$). The mean retentive force in group I was 8.34 and in group II was 9.14. The difference was significant ($P < 0.05$).

Conclusion: The sectional border molding technique was more retentive than single step technique. The choice of border molding technique depends upon the condition of the alveolar ridge and the choice of the operator.

Keywords: Border molding, Edentulous, Impression.

INTRODUCTION

The management of completely edentulous area involves replacement of missing teeth with complete denture. For successful denture therapy, complete denture should be able to perform functions such as retention, stability, mastication etc.¹ Border molding is the shaping of the border areas of an impression material by functional or manual manipulation of the soft tissue adjacent to the borders to duplicate the contour and size of the vestibule. The final impression plays a crucial role in the success and failure of complete denture

prosthesis. The final impression for a complete denture construction involves capturing of the vestibule with border molding technique and then taking an impression of the edentulous area.²

Peripheral seal is established when denture borders contact with the underlying or adjacent tissues and prevent passage of air or other substances. Peripheral areas can be molded with the least possibility of distortion or breakage of the previously completed section. An ideal material should be able to record all desired area, allow simultaneous molding of the borders such that

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number of insertions could be reduced and also there is no propagation of errors with simultaneous insertion.³

There are different materials available to record borders. Different techniques and materials of border molding such as low fusing impression compound, putty PVS, putty condensation silicone and medium viscosity PVS. The technique of using impression compound for border molding is usually divided into steps where sections of the borders are molded in separate applications. This is called as the sectional technique of border molding. Other technique is single step technique.⁴ The present study was conducted to determine the retention force of impressions made by two different techniques.

MATERIALS AND METHODS

The present study was conducted in the department of Prosthodontics. It comprised of 8 patients of both genders. All were informed regarding the study and written consent was obtained. General information such as name, age, gender etc. was recorded. Patients were divided into 2 groups. Group I were those in which single step border molding technique was used and group II comprised of those patients in which sectional technique was used.

Primary impression was taken with irreversible hydrocolloid. Two trays were made which were 2-3 mm short of the sulcus depth. Single step border molding with low fusing impression compound was used with first tray. With second tray, sectional border molding technique was done. Beading and boxing of the impression was done followed by pouring of the cast. Waxing of the denture base was done on each cast and prefabricated stainless hooks were attached in the anterior palatal region. Flasking and curing process was carried out which was followed by deflasking and finishing of the bases. The recording of the denture retentive force was carried out with digital force meter. Results thus obtained were subjected to statistical analysis using chi-square test. P value less than 0.05 was significant.

RESULTS

Shows that two techniques such as single step and incremental border molding technique was used.

Table I Distribution of patients

Total- 8		
Males	Females	P value
5	3	0.01

Table I shows that out of 8 patients, males were 5 and females were 3. The difference was significant (P- 0.01).

Table II The mean retentive values in both groups

Value	Group I	Group II	P value
Mean	8.34	9.14	<0.05

Table II shows that the mean retentive force in group I was 8.34 and in group II was 9.14. The difference was significant (P< 0.05).

DISCUSSION

Single step technique has advantages such as the number of insertions of the trays for border molding is reduced to one and development of all borders simultaneously avoids propagation of errors. The requirements of a material to be used for simultaneous molding of all borders are that it should have sufficient body to allow it to remain in position on the borders during loading of the tray, retain adequate flow while seating in the mouth, does not cause excessive displacement of the tissues of the vestibule, allow some pre- shaping of the form of the borders without adhering to the fingers, have a setting time of 3 to 5 minutes and allows finger placement of the material into deficient parts after seating the tray etc.⁵

In present study, two techniques were used ie. single step and incremental border molding technique. An exacting impression will always have satisfactory retention, stability, and patient comfort. Meticulous border molding provides for various measures for retention of complete dentures. Various studies have been conducted to determine and compare the efficacies of these two techniques. Few drawbacks associated with elastomeric impression materials of putty consistency are thick and overextended borders and shorter manipulation time.⁶

Out of 8 patients, males were 5 and females were 3. We found that the mean retentive force in group I was 8.34 and in group II was 9.14. The difference was significant (P< 0.05). Conventionally borders

are molded using the sectional technique. Increased number of insertions makes such a technique quite tedious and difficult. Also propagation of errors caused by discrepancy in one section can affect the border contours in subsequent section. This is in agreement with Woelfel et al.⁷

Rizk et al⁸ stated that superior retention was demonstrated with single-step border molding with putty rubber base material. Yarapatineni et al⁹ stated that the retention obtained was comparable with two techniques. Anchal et al¹⁰ found that there was a significant difference between group 1 and group 2. The retention obtained in group 2 (mean = 9.05 kgf) was significantly higher than that of group 1 (mean = 8.26 kgf).

Kheur et al¹¹ in their study, one step Border molding was completed for each subject by manual manipulation of the soft tissues adjacent to the tray borders using three different materials ie low fusing impression compound type I b, heavy bodied elastomeric material: polyvinyl siloxane and modified zinc oxide eugenol impression paste. Three examiners evaluated the border molding based on tissue contact, tissue displacement, bond to the tray and overall peripheral seal. Each criteria was scored on a scale of 1-5, with score 1 as bad while score 5 was considered excellent. The average of the score recorded by the three examiners for each criteria was considered. Heavy bodied elastomeric material- polyvinyl siloxane has the best efficiency, while low fusing impression compound type I a had the least efficiency amongst the three when used for the purpose of border molding.

CONCLUSION

The sectional border molding technique was more retentive than single step technique. The choice of border molding technique depends upon the condition of the alveolar ridge and the choice of the operator.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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