

Clinical Evaluation of Two Different Border Molding Techniques for Edentulous Arches of Maxilla

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ABSTRACT

Background: 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. An ideal material should allow simultaneous molding of the borders such that number of insertions could be reduced and also there is no propagation of errors with simultaneous insertion. The present study was conducted with the aim to determine the retention force of impressions made by two different techniques.

Materials and methods: Eight subjects seeking the hospital for prosthodontic rehabilitation for complete dentures were included in the study. The subjects between 50-60 years with well-formed residual alveolar ridges, no exostoses or undercuts, normal TMJ function, no disabling systemic condition were included in the study. Two trays were made for each patient. The trays were kept 2-3 mm short of the sulcus depth. Using the first tray border molding was done using sectional technique with the help of low fusing impression compound. A heavy viscosity siloxane was used to take secondary impression using second tray. Mean of three values was obtained. All the data obtained was arranged in a tabulated form and analyzed using SPSS software. Chi square test was used as a test of significance. Probability value of less

than 0.05 was regarded as significant.

Results: The present study enrolled 8 subjects, out of these there were 5 males and 3 females. The mean age of the subjects was 59.67+/- 3.89 years. In case 1 the mean retentive force by single step technique was 5.64 and with sectional technique was 6.21. In case 8 the mean retentive force by single step technique was 9.90 and with sectional technique was 9.52. The overall mean retentive force in single step was 8.34 and in sectional step was 9.14.

Conclusion: As per our study, the sectional border molding technique appeared to be more retentive than single step technique.

Keywords: Edentulous, Impression, Secondary.

INTRODUCTION

In prosthodontics, the final impression plays a crucial role in the success and failure of a 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.¹ It

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is a time consuming procedure to adapt tray closely to the vestibule for making complete dentures. Initially low fusing impression compound was used. It was introduced by the Green brothers in the year 1907.² Parts of tray were molded in sections for good stability. An ideal material should allow simultaneous molding of the borders such that number of insertions could be reduced and also there is no propagation of errors with simultaneous insertion. The low fusing compound allows for short manipulation time which allows for inefficient time for vestibular tissues to mold the borders of the tray. There is also fear of the operator to burn the intraoral tissues as it requires heat for softening. Finally, elastomers came into being that are now used as alternative to low fusing impression compound. They enable high accuracy, easy manipulation and adequate working and setting time. The materials in use are of polysulfide,³ polyether,^{4,5,6} or vinyl polysiloxane putty.^{7,8} The chief drawback associated with these materials is the odor, staining and thick over extended borders⁹ obtained with some of the materials. According to various recent studies^{10,11} using different materials and techniques of border molding. There was no significant difference in retention of the dentures that were made by single step technique or that were made by sectional technique. The present study was conducted with the aim to determine the retention force of impressions made by two different techniques.

MATERIALS AND METHODS

Eight subjects seeking the hospital for prosthodontic rehabilitation for complete dentures were included in the study. The subjects between 50-60 years with well-formed residual alveolar ridges, no exostoses or undercuts, normal TMJ function, no disabling systemic condition were included in the study. Subjects with high palatal vaults were excluded from the study. The study was approved by the institutional ethical board and all the subjects were informed about the study and a written consent was obtained from all in their vernacular language. Irreversible hydrocolloid was used to obtain primary impression of all the subjects. After blocking of undercuts custom impression trays was made using autopolymerizing acrylic resin. Two trays were made for each patient. The trays were kept 2-3 mm short of the sulcus

depth. Using the first tray border molding was done using sectional technique with the help of low fusing impression compound. A heavy viscosity siloxane was used to take secondary impression using second tray. 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. The patient was made to stand upright with head facing forward and maxilla parallel to floor. The retention force of the denture base was established by the force value that was seen on the force meter at the time the denture base got dislodged. Mean of three values was obtained. All the data obtained was arranged in a tabulated form and analyzed using SPSS software. Chi square test was used as a test of significance. Probability value of less than 0.05 was regarded as significant.

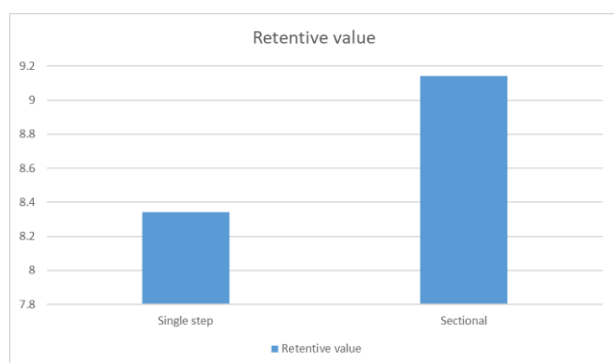
RESULTS

The present study enrolled 8 subjects, out of these there were 5 males and 3 females. The mean age of the subjects was 59.67+/- 3.89 years. In case 1 the mean retentive force by single step technique was 5.64 and with sectional technique was 6.21. In case 2 the mean retentive force by single step technique was 8.56 and with sectional technique was 10.18. In case 3 the mean retentive force by single step technique was 10.22 and with sectional technique was 9.98. In case 4 the mean retentive force by single step technique was 7.20 and with sectional technique was 9.24. In case 5 the mean retentive force by single step technique was 9.87 and with sectional technique was 9.81. In case 6 the mean retentive force by single step technique was 10.50 and with sectional technique was 10.46. In case 7 the mean retentive force by single step technique was 7.16 and with sectional technique was 7.45. In case 8 the mean retentive force by single step technique was 9.90 and with sectional technique was 9.52. The overall mean retentive force in single step was 8.34 and in sectional step was 9.14. (table 1, graph 1)

Table 1: The mean retentive values for single step and sectional border molding techniques

Case number	Single step border molding	Sectional border molding
1	5.64	6.21
2	8.56	10.18
3	10.22	9.98
4	7.20	9.24
5	9.87	9.81
6	10.50	10.46
7	7.16	7.45
8	9.90	9.52
Mean	8.34	9.14
p- value	<0.05	

Graph 1: Showing the mean retentive values for single step and sectional border molding techniques



DISCUSSION

An exacting impression will always have satisfactory retention, stability, and patient comfort. Meticulous border molding provides for various measures for retention of complete dentures. Two techniques documented in the literature for border molding, the sectional and the single-step technique. Various studies^{10,11} have been conducted to determine and compare the efficacies of these two techniques. However, the literature is still ambiguous about the efficacies of these two techniques. Few drawbacks associated with elastomeric impression materials of putty consistency are thick and overextended borders⁹ and shorter manipulation time. Our study we chose injectable PVS because of its adequate flow, dimensional stability and working time.¹² Digital force meter as given by Burns et al.¹³ was used for the objective assessment of retention. In our study, 8 subjects were enrolled, out of these there were 5

males and 3 females. The mean age of the subjects was 59.67+/- 3.89 years. In case 1 the mean retentive force by single step technique was 5.64 and with sectional technique was 6.21. In case 2 the mean retentive force by single step technique was 8.56 and with sectional technique was 10.18. In case 3 the mean retentive force by single step technique was 10.22 and with sectional technique was 9.98. In case 4 the mean retentive force by single step technique was 7.20 and with sectional technique was 9.24. In case 5 the mean retentive force by single step technique was 9.87 and with sectional technique was 9.81.

According to Woelfel et al.¹⁴ approximately 17 insertions were required by 7 dentists in the same patient while using this impression compound. It was a tedious and time consuming procedure. The sulcus of the vestibule must be in contact with the material at single insertion.⁴ According to a study by Rizk¹¹ superior retention was demonstrated with single-step border molding with putty rubber base material. In this study, in case 6 the mean retentive force by single step technique was 10.50 and with sectional technique was 10.46. In case 7 the mean retentive force by single step technique was 7.16 and with sectional technique was 7.45. In case 8 the mean retentive force by single step technique was 9.90 and with sectional technique was 9.52. The overall mean retentive force in single step was 8.34 and in sectional step was 9.14. As per Yarapatineni et al.¹⁰ the retention obtained was comparable with two techniques. There were few limitations of our study, the retention of final dentures was not evaluated and the patient satisfaction was not taken into consideration. The sample size of the study was also small and the post insertion adjustments were also not taken into consideration.

CONCLUSION

As per our study, the sectional border molding technique appeared to be 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. Clinically both the techniques seem to be comparable to each other.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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