

ORIGINAL ARTICLE

COMPARISON OF COMPLETE DENTURE FABRICATED BY TWO DIFFERENT BORDER MOLDING MATERIALS, IN TERMS OF PATIENTS' SATISFACTION

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Background: Restoration of dentition leads to an improvement in the oral health related quality of life. Complete dentures are used to restore this oral cavity disability to its original condition. This study was designed to compare satisfaction levels between two groups of edentulous patients for whom two different border moulding techniques: 'conventional green stick' and 'polyvinyl siloxane material' were employed. **Methods:** This was a cross-sectional questionnaire based study. A questionnaire was designed in the Department of Prosthodontics at the Armed Forces Institute of Dentistry to compare the satisfaction levels between two groups by assessing the following four variables: 'retention', 'stability', 'comfort during final impression procedure' and 'time taken by the procedure'. **Results:** No significant differences were found between the two groups for 'retention', 'stability' and 'comfort during the final impression procedure' ($p>0.05$). For 'stability' there was a significant difference between the two groups. However, as the difference was only that of one patient (31 patients having 'good stability' in Group A, as compared to 32 in Group B); the difference was not considered significant. The conventional border moulding technique took significantly more time as compared to the modified polyvinyl siloxane technique ($p<0.05$). The mean satisfaction score was low (7.36 ± 0.45). There was a significant difference in the patient satisfaction scores between the modified and the conventional border moulding techniques ($p>0.05$). **Conclusion:** Although a significant difference was found between the patient satisfaction levels between the two groups, the clinical significance of these results is still in question as the only factor found to be different between the two groups was the 'time taken'.

Keywords: Denture, fabricated, moulding, satisfaction

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INTRODUCTION

Complete tooth loss leads to impairment, disability and handicap.¹ Restoration of dentition leads to an improvement in the oral health related quality of life. Complete dentures are used to restore this oral cavity disability to its original condition. Making an impression of an edentulous arch requires a unique combination of managing movable soft tissues along with different materials and techniques for accurate reproduction. A broad range of possible impression materials and techniques exist for recording a final impression for complete dentures.²

Impression materials are used to register or reproduce the form and relations of the teeth and the surrounding oral tissues.³ The low-viscosity elastomeric impression material is advantageous because it creates minimal pressure, produces accurate details, does not distort easily, and is easy to handle. A classic impression technique commonly used for the fabrication of complete dentures uses a custom impression tray with Zinc oxide Eugenol (ZnO) impression and modelling plastic impression compound.⁴ Dental impression compounds have constituents that are biologically active, even in the

set stage, and have the potential to elicit adverse biological reactions.⁵

An alternative method of making a final impression for complete dentures for edentulous arches is to use polyvinyl siloxane (PVS) elastomeric impression materials and custom trays with peripheral relief.⁶ Primary skin irritation of the PVS impression material is considered negligible.⁵ In a previous study the average number of adjustment visits for patients treated with the traditional technique and modified technique was same (2.68).⁷ In a local study 26.6% of patients treated with modified technique were highly satisfied from complete denture (only 10% poorly satisfied) as compared to 10% higher satisfaction rate of traditional technique (36.6% were poorly satisfied).¹ In local dental institutes 86.6% of dental graduates are using low fusing impression compound and ZnO Eugenol for final border moulding during complete denture fabrication.⁸

The purpose of this study was to find out patient satisfaction from the complete denture fabricated by using more recently developed impression materials that are easier to manipulate,

than those used previously and allow us to achieve good and faster results.

MATERIAL AND METHODS

This cross-sectional study was approved by the Ethical Committee of the Armed Forces Institute of Dentistry, Rawalpindi. The questionnaire was designed in the Prosthodontics Department at the Armed Forces Institute of Dentistry, Rawalpindi. The questions were validated by a consultant specialist in Prosthodontics. The questionnaire was divided into two sections. The first section comprised the statement of the written informed consent form. After being given verbal instructions, i.e., explaining the aims, objectives and the procedure of the study, informed written consents were obtained from the participants.

The second section comprised two parts. Questions regarding demographic details were asked in the first part of the questionnaire. Participants were asked about their name, age, gender and address. The second part of the section was marked by the investigator who scored the patient satisfaction levels of the participant regarding the following variables: retention, stability, and comfort during final impression procedure, and the time taken by the impression procedure. The patient satisfaction score was calculated by adding the scores of all the variables, with the scores ranging from a minimum of 5 to a maximum of 12.

The main outcome was the patient satisfaction score which ranged from 5–12. The study was designed with two groups for comparison of

satisfaction: Group A=border moulding using conventional green stick method; and Group B=border moulding done poly vinyl siloxane putty impression material. Patients having complete loss of teeth in both jaws, complete denture wearer for the last 3 years, edentulous patients of both genders with age ranging from 45–70 years, healthy patients with well-developed ridges, patients who are able to understand and respond to the questionnaire, and patients who could be available for follow up visits, were included in the study. Patients with highly resorbed ridges, with temporomandibular joint disorder, with congenital craniofacial anomalies/syndrome, and those with skeletal Class I and Class II profile were excluded.

Data analysis was done using SPSS-19. Variables were described and satisfaction rates in two groups were compared using Mann Whitney U test at 5% significance level.

RESULTS

The response rate was 100%. There were 21 males in group A, and 19 in group B. The mean age of the sample was 57.77 ± 6.19 years. Table-1 illustrates the results of the study.

The mean patient satisfaction score of the whole sample was 7.36 ± 0.63 . The mean patient satisfaction score for Group A was 7.84 ± 0.45 , whereas the mean for Group B was 6.88 ± 0.34 . The difference between the two groups was found to be significant, when calculated using the Mann Whitney U Test ($p < 0.05$).

Table-1 Frequency Distribution of the Outcome Variables for Groups A and B

	Retention		Stability		Comfort		Time		Patient Satisfaction
	Good	Poor	Good	Poor	Fair	Poor	More	Less	
Group A	6	26	31	1	32	0	32	0	7.84 ± 0.45
Group B	4	28	32	0	32	0	0	32	6.88 ± 0.34

DISCUSSION

This study set out to assess any difference in the satisfaction levels of two groups of complete denture patients undergoing two different border moulding techniques. Both groups were balanced for age and gender distribution at the outset of the study. The mean satisfaction rates were higher and statistically significant in Group A (border moulding using conventional green stick method) compared to Group B (border moulding done poly vinyl siloxane putty impression material).

Sharif in his study of a comparison of complete patient satisfaction levels between a group where the neutral zone technique and another group where the conventional technique was used reported significant differences between the two groups.

Patients for whom the modified neutral zone technique was used had significantly greater satisfaction levels in comparison to the group where the conventional technique was employed. However, even in the neutral zone technique group, only 26.6% reported as being highly satisfied with their treatment, as compared to 10% highly satisfied patients from the conventional technique group. Subsequently, even in the modified neutral zone technique group, 73.4% of the patients were either moderately or poorly satisfied with their treatment, which suggests that the majority of the patients undergoing treatment even for this group were very satisfied with the technique employed for them. This study was done in the same population as the present study.

The present study showed no significant result in the 'retention', 'stability' and the 'comfort during the final impression procedure'.

There was a highly significant difference in the time taken by the two procedures. All participants from Group A reported that the conventional border moulding technique took 'more time'. On the other hand, all participants from Group B reported the PVS border moulding technique as taking 'less time'. Time consumption for any procedure is an important factor with respect to the patient satisfaction levels. The results clearly suggest that as far as 'time taken for the procedure' is concerned, patients were more satisfied with the PVS technique.

The overall satisfaction scores were calculated by summing up the four mentioned variables. For a scale ranging from five to twelve, the mean satisfaction score for the whole sample was low (mean=7.36±0.63). This suggests that patients in the present study population are generally not satisfied by the final impression procedures currently practiced. These findings are in compliance with those from the study done by Sharif.

There was a difference reported in the mean satisfaction levels between Group A (7.84±0.45) and Group B (6.88±0.34). Although, this difference was found to be significant ($p<0.05$), the statistical significance must be treated with caution, because out of the four variables that were used to assess the patient satisfaction levels in the two groups, a difference was only reported for 'time taken' between the two groups. As there was a large difference between the two groups for the 'time taken' for the procedures, it had a major impact on the statistical significance on the reported patient satisfaction levels. However, as the 'stability', 'retention' and the 'comfort' were not different for the two procedures, the clinical significance of the modified technique as compared to the conventional technique may not be ascertained with enough confidence.

Another factor that has not been considered in this study was the increased cost of the PVS material as compared with the cheaper conventional 'green stick' border moulding material.

Although this was a controlled trial, randomization was not done. As there was a distinct difference between the two groups, blinding of the dentists or the patients was not possible.

CONCLUSIONS

Although a significant difference was found in the satisfaction levels of patients for whom the conventional and the PVS border moulding techniques, the findings of the present study do suggest a need for future research. In future randomized controlled trials should be done to further investigate the differences in satisfaction levels between these two groups.

The overall low satisfaction levels of complete denture patients suggest that there is a future need for assessing the underlying reasons for these low levels. Also, future research should be carried out to investigate the efficacy for alternative techniques for the border moulding procedure during complete denture fabrication.

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