

Construction Faults Associated with Complete Dentures Made by Clinical Students

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ABSTRACT

Objective: The objective of this study was to evaluate the construction faults associated with complete dentures made by clinical students.

Study Design: Descriptive / cross-sectional study

Place and Duration of Study: This study was conducted at Prosthodontics; Department Institute of Dentistry; Liaquat University of Medical and Health Sciences Jamshoro from May 2015 to October 2015

Materials and Methods: Total 197 complete denture wearer's patients were recruited in this study. Faults associated with vertical dimension, centric relation, denture base thickness, finishing and polishing were examined and noted in proforma. Data was analyzed by SPSS version 17.0.

Results: Out of 197 patients male and female patients were 56.3% and 43.7% respectively. Vertical dimension was found to be high in 82% patients and centric relation was noted 81% as right and 19% as wrong. According to thickness of denture base plate, 80% were thick and 5% were thin denture base. According to finishing and polishing of dentures, 55% dentures were seen with satisfactory results.

Conclusion: It is concluded that the most common faults in construction of complete dentures were high vertical dimension, thick denture base plates and finishing & polishing.

Key Words: Complete Denture, Faults, Clinical students

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INTRODUCTION

Loss of teeth is measured as poor health outcome and may compromise the quality of life.^{1,2} Although the number of adults losing their natural teeth is shrinking, there are still big numbers of edentulous adults in the population.¹ Conventional complete denture prosthodontics involve complex procedural skills to obtain the management objectives which include function, comfort and aesthetics.³⁻⁶ However, wearing of newly fabricated dentures may be related to some complains specially soon after the insertion of the prosthesis.^{7,8}

The regular complains with complete dentures are those relating to pathologic injuries brought on by gingival irritability, loss of denture with holding by mechanical means, the increase in food storage under the appliance, insufficient chewing efficiency, problems in speaking, unpleasant looks, prosthesis breakage and separation of teeth from base plate.^{1,9-15)}

This might be results because of certain technical reasons include superficial irregularities, overextension, porosity, increased monomer content, alteration in shape and unsatisfactory finishing and polishing of prosthesis.¹⁶

The greatest observed faults in prosthesis fabrication associated with retention, vertical and horizontal jaw relationships.¹ The purpose of complete denture fabrication is to make prosthesis which give good esthetics, adequate retention and stability, proper speech, sufficient chewing efficiency, maintain good facial support, easy to insert and remove by patient and do not harm the basal structures.² Important necessities for the fabrication of a suitable prosthesis are: A good replica of supporting and retentive tissues of the jaws, Normal vertical dimension, Correct centric relation, Correct position of artificial teeth, An occlusal plane in harmony with the patient's own condylar excursions and Esthetics.¹⁷

Many studies^{1,14,18,19} have been piloted on patients complains after delivery of complete denture. Pain or discomfort^{18,19} was stated by some researchers as the most frequent complaint in new denture wearers while others^{14,20} stated that poor retention and stability were the most common complaints.^{14,20} The theory has been established that the complete denture patients with complains only when there is a real design fault or a tissue problem.^{1,21} Patient complaint related to their

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dentures is a terrifying for the Prosthodontists, and is seen as a root of frustration if it exists ever after adjustment so the purpose of this study is to evaluate the construction faults associated with complete dentures made by clinical students. This study enables us to define the construction faults in complete dentures made by clinical students, thereby it is possible to address the areas where these errors are resulting which help for better future prosthesis and to minimize the complains in complete denture wearers.

MATERIALS AND METHODS

It was a descriptive-cross-sectional study carried out from May 2015 to October 2015 at Prosthodontics department Institute of Dentistry in Liaquat University of Medical and Health Sciences Jamshoro. Total 197 patients complete denture wearers made by clinical students, with completely edentulous maxillary and mandibular ridges were included in this study. Sampling technique was non – probability consecutive sampling technique.

Patients who were not willing to participate in this study, medically compromised patients, denture made with poor quality of material were excluded from this study.

Data Collection Procedure: After fulfilling the inclusion and exclusion criteria, the purpose of this study was explained to all participants in detail. An ethical approval was sought from the ethical review committee of university. A written informed consent was taken from every participant. After one week of delivery of the prosthesis the examination of complete denture made by clinical students was done both extra orally and intra orally. The examination of prosthesis that include construction faults related with complete denture i.e. vertical dimension, centric relation, denture base thickness, finishing and polishing was done. Vertical dimension were checked by measuring the distance between the tip of the nose and chin at rest and also when teeth were in contact. Vertical dimension were taken as normal if the difference between the rest and occlusal vertical dimension was 2 mm. if difference was high than 2 mm then the condition was grouped as high and if the difference was below than that limit then the denture was categorized as with low vertical dimension.

Centric relation were checked by asking the patient to close his/her mouth in centric position, if the centric relation coincide with centric occlusion then the denture was grouped in right centric relation, if the positions didn't coincide then it was categorized as wrong centric relation.

2 mm thickness of denture base were categorized as normal and more than 2 mm were grouped as dentures with thick base plate while the complete dentures

having base plate thickness less than 2 mm were grouped as dentures with thin base plates.

Dentures were categorized as satisfactory according to finishing and polishing if their poly surface was smooth, shiny and properly contoured. Dentures were recorded with unsatisfactory finishing and polishing if they were rough, dull and the gingival contouring was not done properly.

Finally the status of complete denture' construction faults were noted in proforma accordingly.

Data Analysis: Descriptive statistics was analyzed by SPSS version 17.0 software. The qualitative variables like gender, vertical dimension, centric relation, denture base thickness, finishing and polishing were presented as frequency and percentages. The quantitative variables like age were presented as mean $\pm$ standard deviation.

RESULTS

Total 197 patient's dentures were evaluated for construction faults. In this study 56.3% were male and 43.7% were female patients. The male female ratio was 1.2:1.

Vertical dimension (VD) was categorized into three groups normal, high and low. 14.7% patients had dentures with normal VD, 81.7% with high VD 3.6% patients experiencing dentures constructed at low VD (Figure-1)

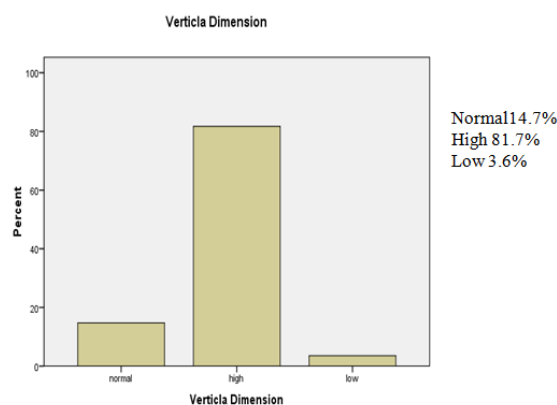


Figure No.1: Vertical Dimension

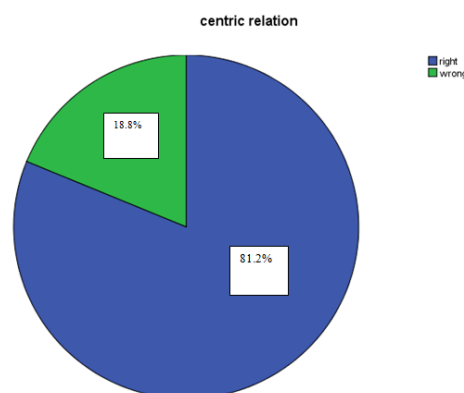


Figure No.2: Centric Relation

According to centric relation (CR) of complete dentures, 81.2% patients having dentures with right CR, and 18.8% had dentures with wrong CR. (Figure-2) According to thickness of denture base plate, 14.7% patients were found to have dentures with normal thickness, 80.7% patients having dentures constructed with thick, 4.6% patients experiencing dentures fabricated with thin denture base plate. (Table-1) According to finishing and polishing of dentures, 55.3% patients were found to have complete dentures with satisfactory finishing and polishing and 44.7% patients having complete dentures with unsatisfactory results of finishing and polishing. (Figure-3)

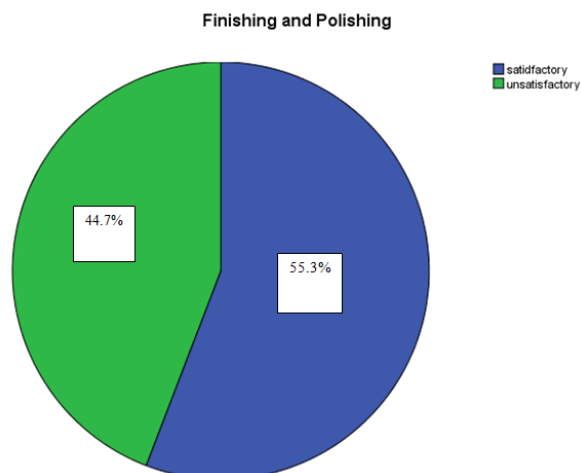


Figure No.3: Finishing and polishing of complete dentures

Table No.1: Thickness of base plate in complete dentures

	Variable	Frequency	Percent
	Normal	29	14.7
	Thick	159	80.7
	Thin	9	4.6
	Total	197	100.0

DISCUSSION

This was descriptive study in which 197 patients were examined wearing newly constructed complete dentures for the evaluation of construction faults. In this study only four major types of complete denture construction faults were evaluated

In this study males were found to be more as compare to females which is in agreement with Memon MR et al² results. The probable reasons could be females as a rule doesn't look for treatment so effectively when contrasted with males, particularly in this some piece of the nation where females are customarily home-bound. To maintain a harmonious craniofacial system, the dental practitioner must establish an appropriate occlusal vertical dimension.²² Establishing the optimum

occlusal vertical dimension is critical to fabricating a complete denture that will be harmonious with the patient's oral craniofacial system.²² In this study majority of cases were observed with incorrect vertical dimension i.e. 85.1%. while very low percentage of cases with normal vertical dimension (14.7%). These results are same as with Brunello& Mandicos¹⁸ and Aghdaee NA²³ et al results who observed incorrect vertical dimensions cases of 68% and 72.5% respectively.

Centric relation is regarded as a valid reference position for certain clinical treatment modalities.²⁴ However, it is difficult to know that this position has been recorded with the condyle-disc complex in the anatomical position of centric relation. This is an anatomical position, and as such it cannot be substantiated clinically, because no particular technique or system can confirm exactly where the condyle-disc complex is located in the temporo mandibular fossa.²⁴

This study results are describing that the the centric relation was right in majority of cases (81.2%) which are in contrasting with the results of Brunello& Mandicos¹⁸ results who find out the incorrect jaw relationships in 94% of cases, Aghdaee NA et al²³ observe 86.6% cases of incorrectly recorded jaw relationships, and Memon MR² results concluded 94% cases with incorrect jaw relationships.

Establishing the pleasing aesthetics of a patient is a significant key for the success of all the dentists.²⁵ The thickness of acrylic resin dentures is believed to be a significant factor in determining the magnitude of the shrinkage that occurs during curing.²⁶ The study results are not in agreement with the JamaniKD and Abuzar MAM studies.²⁶ This might be due to methodological difference and technical difference.

During denture construction, all factors including ratio, handling and inclusion of acrylic resin as well as curing, finishing and polishing are fundamental.²⁷ Smooth and highly polished surfaces are of utmost importance for patient comfort, aesthetic, hygiene and restoration longevity. Denture can work as a reservoir, in which surface irregularities increase the probability of micro-organism retention and protection from shear forces, even after denture cleaning.²⁷ In this study the majority of results are satisfactory (55.3%) which are in agreement with the results of Julie C et al.²⁷ Like with other studies, this study also has limitation of restricted sample size, inconsistent data accumulation and lack of availability of records, there are still no reliable methods to predict the outcome of complete denture faults and there are many problems related to construction faults with complete dentures. However, it has been tried to provide some information about the occurrence of some construction faults. It was a single operator based study so operator bias could not be eliminated.

CONCLUSION

This study proposes that in most cases, patients wearing complete dentures present with complaints only when there is actual design fault. Within the light of limitations it can be concluded that the most common faults in construction of complete dentures were high vertical dimension, thick denture base plates and finishing & polishing.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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