

# Upper Complete Denture Base Retention Constructed Through Closed Mouth Impression Technique

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## ABSTRACT

**Background:** Retention is one of the desirable qualities for complete denture. It is well established that impression technique affects the retention.

**Aim:** To evaluate the retention of complete denture constructed through the closed mouth impression technique.

**Methods:** A cross-sectional comparative study was carried out in the Department of Prosthodontics, de'Montmorency College of Dentistry/ Punjab Dental Hospital, Lahore. The duration of the study was six months. Data was collected, statistical analysis done by SPSS software program and results were tabulated. 40 otherwise healthy, (21 males and 19 females) edentulous subjects without any denture experience were invited with an age range of 50-65 years. Edentulous patients without any denture experience were invited from outdoor, Department of Prosthodontics, de'Montmorency College of Dentistry/ Punjab Dental Hospital, Lahore. After taking consent structured three (03) proformas were filled for every patient. Denture base constructed by closed mouth impression technique was evaluated by three operators in the anterior, right and left canine area using Kapur index.<sup>7</sup> Results were analyzed and compared using descriptive statistical analysis protocol.

**Conclusion:** In majority, retention of upper complete denture base constructed through closed mouth technique was found to be good.

**Keywords:** Complete denture base, Retention, impression techniques

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## INTRODUCTION

Complete dentures are the most commonly considered treatment option for management of edentulous patients<sup>1</sup>. Retention is one of the factors for a successful complete denture after insertion. Denture retention is influenced by patient and prosthesis related factors. It is incorporated into the denture at the stage of the impression making. These impressions are made either through open or closed mouth impression technique<sup>2,3,4</sup>.

Retention is checked by firmly seating the denture in the mouth and trying to dislodge with force along path of placement. If the denture resists it is said to have adequate retention.<sup>5-6</sup> Literature suggests that the retention can be quantified by three ways: subjective analysis, operator's evaluation and by using mechanical devices<sup>7,8,9,10,11</sup>.

The literature lacks the evidence where denture base was fabricated and quantified for retention through operator's evaluation.<sup>7</sup> It is true that there are many confounding variables in such a study but the

research in such areas of the subject can lead to better understanding of the basics of Prosthodontic specialty, which is ultimately related to better patient management. A lot has to be explored with new horizons and frontiers have to be touched. Purpose of Study was to evaluate retention of Upper Complete Denture base constructed through closed mouth technique

## METHODOLOGY

The current blind study was carried out on Forty (40) edentulous patients (21 males and 19 females) in an age range of 50-65 years, who visited the Department of Prosthodontics, de'Montmorency College of Dentistry/ Punjab Dental Hospital, Lahore  
*Inclusion criteria:* New denture wearers, edentulous patients of both gender otherwise healthy.

**Exclusion criteria:** Patient suffering from neuromuscular disease, any oral pathology, Short primary impressions. The detailed procedure of the study was explained to the patient and a written consent was obtained and demographic data were recorded. Primary impression of the edentulous patient was made in a stock tray with the impression compound and alginate wash impression. Custom made tray was processed using auto polymerizing acrylic resin without spacer and/or perforations. Extensions of the tray were checked in the patient's

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mouth. Record occlusion rims were fabricated and jaw relations were recorded. Closed mouth secondary impression of both arches was recorded using metallic oxide impression paste and required oral muscular movements were performed. Denture bases were constructed with heat cured acrylic resin. Six anterior teeth were placed with cold cured acrylic resin using biometric guide lines. Three (03) experienced Prosthodontists examined the denture base and quantified for retention in three designated areas by using Kapur<sup>7</sup> index., where, denture bases that showed slight resistance to vertical pull or forces scored poor or 1. Denture bases that showed moderate resistance to vertical pull or forces scored fair or 2. Denture bases that showed good resistance to vertical pull or forces scored good or 3. The operators were explained and trained prior to data collection procedure. A total of 120 assessments were made and quantified by each assessor on 40 patients. The results were recorded by each assessor on separate proformas for every patient. Thus three proformas for the same patient were filled. The results of the assessment were not shown or disclosed to the other assessors before and during the study. Three minutes interval was given between

every reading. The measurements made by the three assessors were presented in the tabulated form.

**Statistical analysis:** The data was transferred and analyzed using SPSS version 16. The demographic variables were analyzed using simple descriptive statistics for the quantitative data. Areas of base evaluated by each assessor were presented in tabular form and overall results were analyzed for proportion and types for closed mouth impression techniques.

## RESULTS

Table 1: Gender distribution (n=40)

Gender	Frequency	%age
Male	21	52.5
Female	19	47.5

Table 2: Age distribution of the subjects (n = 40)

Age range	Frequency	%age
<50	7	17.5
50-54	7	17.5
55-59	5	12.5
60-64	15	37.5
65>	6	15.0

Table 3: Evaluation of the retention of denture bases constructed through closed mouth impression technique. (n=40)

Poor Retention (Frequency %)			Fair Retention (Frequency %)			Good Retention (Frequency %)			Total readings done by each assessors (n=120)(Frequency)
Incisor area	Rt Canine	Lt Canine	Incisor area	Rt Canine	Lt Canine	Incisor area	Rt Canine	Lt Canine	
<b>Assessor 1</b>									
1(2.5%)	4(10.0)	4(10.0)	30(75.0)	28 (70.0)	28 (70.0)	9 (22.5)	8 (20.0)	8 (20.0)	120(100)
<b>Assessor 2</b>									
4(10.0)	6 (15.0)	6 (15.0)	29 (72.5)	27 (67.5)	27 (67.5)	7 (17.5)	7 (17.5)	7 (17.5)	120(100)
<b>Assessor 3</b>									
4(10.0)	5 (12.5)	6 (15.0)	26 (65.0)	26 (65.0)	26 (65.0)	10 (25.0)	9 (22.5)	8 (20.0)	120(100)
<b>Mean</b>									
3(7.5)	5(12.5)	5.33(13.32)	27.66(69.15)	27(67.50)	27.66 (69.15)	8.66(21.65)	8(20)	7.66(19.15)	

Gender and age distribution is shown in table 1 & 2 respectively. Retention assessed is shown in table 3.

## DISCUSSION

The study showed good inter-examiner results repeatability and thus internal consistency. It was found that the Kapur<sup>7</sup> retention scale is sufficiently sensitive enough to discriminate between the upper denture bases constructed through the closed mouth impression techniques. It can therefore be used separately as a routine diagnostic tool and to investigate the relationship between denture qualities and functional 'outcome' such as difficulty in eating or in dietary selection<sup>13</sup>

In the current study, the retention of upper denture bases constructed through closed mouth impression techniques was evaluated. The study population was homogenous in relation to age and

gender as the retention was evaluated by three assessors. Hence every subject served as his or her own control. This is in agreement with other studies like Kikuchi<sup>12</sup> et al in which the results concluded that mean force of retention of the tray was increased after micro abrasion on the tissue surface of the palatal bases so each patient behaved as his own control. Similar was the case in a study done by Corrigan<sup>13</sup> et al on 40 subjects, comprising 17 men and 23 women. Uysal<sup>14</sup> et al in their study included 32 patients (18 females and 14 male) and also found the same results on patients who were edentulous for about 10 years. They evaluated the masticatory function and the retention of the maxillary dentures. Retention of the dentures was scored by the Kapur<sup>7</sup>

index. Colón<sup>15</sup> et al conducted a similar study in which each patient behaved as his own control. They evaluated dislodging forces in three different parts on the three different denture base plates constructed for the same patient. It was found that maximum dislodging force, evaluated through a mechanical system, was in the anterior region and least in the posterior region.

Davidson<sup>16</sup> evaluated the retention of the complete denture by Kapur<sup>7</sup> scale for any replacement or modification in the existing prosthesis. The study showed it clearly that Kapur<sup>7</sup> scale is sufficiently sensitive to indicate the future treatment needs of the existing denture. The reproducibility and reliability of the study inter-examiner results were in agreement with the study of the Bernier<sup>17</sup> et al. They developed a criterion to clinically evaluate denture base stability and retention. Olshan<sup>18</sup> et al conducted a clinical trial using Kapur<sup>7</sup> scale for evaluating denture retention. They confirmed the sensitivity of the scale for the retention of the denture bases before and after the use of denture adhesives. Corrigan<sup>13</sup> et al demonstrated an inter-examiner reliability. The results of their study showed that this function based criteria can be used to give strong agreement between the two examiners involved contrary to this study assessors were part of the study. The result of this study are in agreement with the results of the study conducted by Hobkirk<sup>4</sup> where he found that the closed mouth impression technique produces more accurate impression of the tissues. He has also pointed out that this impression technique was dependent upon the operators' skill to trim the record rims and active participation of patient's functional movements performed during impression taking. The same has been advocated by other studies stating clearly that the overextended impressions can be retentive impressions but the situation changes entirely when the base plate is constructed from them and inserted into patient's mouth.<sup>19-20</sup>

## CONCLUSION

In majority, retention of upper complete denture base constructed through close mouth technique was found to be better.

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