

## RELATIONSHIP BETWEEN SATISFACTION WITH COMPLETE DENTURES AND BASAL SEAT CHARACTERISTICS

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### ABSTRACT:

**Aim:** To investigate the relationship between patients self perceived satisfaction and basal seat characteristics in edentulous patients attending a teaching hospital in Lagos.

**Materials and Methods:** Consecutive edentulous patient seen for 6 months in Lagos University Teaching Hospital, Lagos were recruited for this longitudinal study. The data collected were basal seat characteristics and self perceived satisfaction.

**Results:** A total of 30 patients were seen but only 24 complied with the study protocol. The use of objective assessment in classifying maxillary residual ridge showed that there was a significant association ( $P=0.045$ ) between the ridge and self perceived satisfaction. There was no significant association between self perceived satisfaction and shape of mandibular ridge, palatal vault and vestibular depth.

**Conclusion:** There was a significant association between shape of maxillary residual ridge and self perceived satisfaction. Objective preclinical assessment of residual ridge may help to project satisfaction and determine treatment option.

### الملخص العربي

#### العلاقة بين الرضا بأطقم الأسنان الكاملة و خصائص مقعد الارتكاز

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**الهدف:** لبحث العلاقة بين الرضا الذاتي للمرضى فاقدي كامل الأسنان وخصائص مقعد الارتكاز للمرضى الذين يحضرون للمستشفى التعليمي في لاغوس.

**المواد والطرق:** المرضى فاقدي كامل الأسنان و المترددين على مدار 6 أشهر لمستشفى جامعة لاغوس التعليمي تم اختيارهم لهذه الدراسة الطويلة المدى. البيانات التي تم جمعها كانت خصائص مقعد الارتكاز و الرضا الذاتي.

**النتائج:** شوهد ما مجموعه 30 مريضاً ولكن 24 منهم امتثلوا لبرنامج الدراسة. وأظهر التقييم الموضوعي في تصنيف قمة الفك علوي المتبقية أن هناك ارتباطاً وثيقاً ( $P = 0.045$ ) بين شكل قمة الفك العلوي والرضا الذاتي. لم تكن هناك علاقة ذات دلالة إحصائية بين الرضا الذاتي وشكل قمة الفك السفلي المتبقية، وسقف الفك العلوي، وعمق الدهليز.

**الخلاصة:** كان هناك ارتباط كبير بين شكل قمة الفك العلوي المتبقية والرضا الذاتي. قد يساعد التقييم الموضوعي ما قبل السريري لشكل الفك في إظهار الرضا الذاتي وتحديد خيار العلاج.

## INTRODUCTION

Tooth loss is frequently associated with anatomical changes that include marked reduction in height and width of alveolar bone as a result of bone resorption.<sup>1</sup> Most of these changes occur in the first year following extraction but it continues throughout life.<sup>1,2</sup> The morphological changes which take place after tooth loss could either be extra oral or intra oral. These changes occur both in soft tissue and bone. The major extra oral change is facial collapse which includes cheek sinking in and reduction in vertical facial height.<sup>3</sup> Intraoral changes include thinning and atrophy of mucosa covering alveolar ridges, shallow sulci, flabby ridge forms, shallow palatal vault and forward and lateral spread of tongue.<sup>3</sup>

The delay in tooth replacement usually leads to severe and progressive bone loss.<sup>4,5</sup> It has been stated that alveolar bone loss is generally more pronounced in the mandible and it's characterized by individual variability in volume and rate of bone resorption.<sup>6</sup> In a mixed longitudinal study<sup>4</sup> carried out over a period of 25 years, bone loss in edentulous individuals was found to be four times greater in the mandible than in the maxilla. The typical pattern of residual ridge resorption eventually results in the medial-lateral and anterior-posterior narrowing of the maxillary denture foundation and a widening of the mandibular denture foundation.<sup>7</sup>

Alveolar bone loss leads to reduced alveolar bone height and width which generally causes a reduction in denture bearing area.<sup>8</sup> Residual alveolar ridge should be prominent enough to ensure stability and good retention. It has been observed that gross ridge resorption and poor denture stability is more common in the mandibular arch.<sup>9</sup> In the maxilla, the alveolar bone may occasionally be replaced by fibrous tissue in the anterior region, which may cause the upper denture to become displaced during function leading to reduction in stability and retention.

For edentulous patients, successful denture therapy is influenced by these biomechanical phenomena of support, stability, and retention.<sup>10</sup> When these phenomena are not met, patient is dissatisfied with dentures. This study aims to find out the relationship between the patient's satisfaction with complete denture and basal seat characteristics like shape of residual ridge height, width, palatal vault pattern.

## MATERIALS AND METHODS

The study was a descriptive study carried out in the prosthetic outpatient clinic, Lagos University Teaching

Surulere Lagos State, Nigeria. Approval was obtained from institution's Research and Ethics Committee to carry out the study. Informed consent was obtained from the patients before the commencement of the study. Edentulous patients seen in the prosthetic clinic for a period of 6 months were randomly recruited for the study. All patient who were highly motivated, who had no systemic disease, whose systemic disease were controlled and patients with no preprosthetic surgery were included. Clinical examination was carried out by two calibrated dentist.

Shape of edentulous ridge was assessed subjectively by visual examination and classified into 4 shapes - U, U-V, V, and Flat shape<sup>11</sup> and objectively using vernier caliper to measure the breadth of residual ridge at the left and right first molar region. Measurement was done at 3mm height in maxilla and 2mm height in mandible using an indelible pencil to mark the level.<sup>12</sup> These discrimination values<sup>12</sup> were used to classify the residual ridge.

For the maxilla, "V" shaped edentulous ridge corresponded to < 7mm to 7mm. "U" shaped edentulous ridge corresponded to 9mm and > 9mm. While "U-V" shaped edentulous ridge corresponded to > 7mm to < 9mm. For Mandible, "V" shaped edentulous ridge corresponded to < 5mm and 5mm. "U" shaped edentulous ridge corresponded to 7mm and > 7mm. "U-V" shaped edentulous ridge corresponded to above 5mm but less than 7mm. U shaped ridge denotes mild resorption, U-V shaped ridge denotes moderate alveolar resorption and V shaped residual ridge denotes marked resorption.<sup>8</sup>

Sulcular depth was determined with a periodontal probe which was used to measure the depth from the vestibule to the crest of the ridge. Modified reference scale was used.<sup>13</sup> The reference points of measurement were the sites corresponding to the central fossa of the right and left first molar. The discrimination value<sup>13</sup> used was as follows;

For mandible the alveolar height was classified into low, middle and high. For "low" and "middle" were 0mm and "middle" and "high" were 5mm. For maxilla "low" and "middle" were 6mm and "middle" and "high" were 10mm. This reference scale was not too clear, for clarity this was modified to adequate and inadequate. For mandible alveolar height greater than 5mm and equal to 5mm was adequate and alveolar height lesser than 5mm was inadequate. For maxilla alveolar height greater than 10mm and equal to 10mm was adequate and alveolar height lesser than 10mm was inadequate.

Palatal vault was determined by visual assessment and classified into U, V and Flat shape.

The quality of dentures was assessed by two calibrated prosthodontists and a consensus was reached on the quality of fit, aesthetic, extension, vertical relation, and occlusion. These parameters were rated either 1 or 0 individually, such that the expected total sum for quality of the denture is 5. A total score of 5, 4, 3, 2, 1 corresponds to excellent, very good, good, fair and poor quality respectively.<sup>14</sup> Subjects were followed up for 12 months and investigator administered a standardized questionnaire. Information on satisfaction was sought from the patients. All the items of positive nature were scored as 2, 1, 0 (yes, uncertain and no) and reversely for the negative items. The total score was 10. Scores  $\geq 5$  denotes satisfaction. Data collected was analyzed with SPSS 16 statistical software's for windows (version 16.0 SPPS Inc, Chicago IL). Chi square statistical test was employed to determine the relationship between satisfaction and anatomical forms. The statistical significance of outcomes was evaluated at 95% confidence level and the level of significance was set at 0.05.

## RESULTS

Thirty patients participated in the study but only 24 participants complied with the study protocol. The age ranged between 20-90 years with mean age at  $63.5 \pm 17.67$  years. Out of this 24 participants, 2 (8.30%) had single lower edentulous ridge, 5 (20.80%) had single upper edentulous ridge and 17 (70.80%) had both upper and lower edentulous ridge. Twenty two (91.60%) participants had upper edentulous arch.

Table 1 shows that more than half (59.09%) of patients had U shaped palatal vault. There was no significance relationship between palatal vault and self perceived satisfaction ( $P = 0.83$ ). Classification of residual ridge using visual assessment did not demonstrate a significant association between maxillary residual ridge and satisfaction ( $P = 0.065$ ). Using objective assessment, there was significant association between maxillary residual ridge and satisfaction ( $P = 0.045$ ). Patient with U shaped (54.55%) ridge were more satisfied with their dentures.

**Table1.** Basal seat factors and self perceived satisfaction.

Basal seat characteristics	Self Perceived Satisfaction		Total	P value
<b>Shape of palatal vault</b>	satisfied	Not satisfied		0.83
<b>U shaped</b>	8 (36.36%)	5 (22.73%)	13 (59.09%)	
<b>Flat Shaped</b>	4 (18.18%)	1 (4.55%)	5 (22.73%)	
<b>V Shaped</b>	3 (13.64%)	1 (4.55%)	4 (18.18%)	
<b>Shape of edentulous maxillary ridge (subjective assessment)</b>				0.065
<b>U shaped</b>	11 (50%)	4 (18.18%)	15 (68.18%)	
<b>UV Shaped</b>	1 (4.55%)	1 (4.55%)	2 (9.10%)	
<b>V Shaped</b>	3 (13.64%)	2 (9.09%)	5 (22.73%)	
<b>Shape of edentulous maxillary ridge (subjective assessment)</b>				0.045*
<b>U shaped</b>	12 (54.55%)	2 (9.09%)	14 (63.64%)	
<b>UV shaped</b>	3 (13.64%)	4 (18.18%)	7 (31.82%)	
<b>V shapes</b>	0 (0%)	1 (1%)	1 (4.55%)	
<b>Total</b>			22 (100%)	

Table 2 shows no significant association between mandibular residual ridge and self perceived satisfaction ( $P=1$ ). No subject was classified as having V shaped residual ridge using objective assessment. There was no significant association between ridge and satisfaction ( $P=0.31$ ). Majority (81.82%) of participants had adequate maxillary vestibular depth. Most subjects who were satisfied with dentures had adequate depth (59.09%) but there was no statistical significance ( $P=0.57$ ). Majority of subjects had adequate mandibular vestibular depth with 57.89% of subjects having adequate depth satisfied with their denture ( $P=1$ ). Table 3 shows 54.17% of participants with normal salivary viscosity satisfied with their dentures ( $P=1$ ).

## DISCUSSION

This study showed the overview of the relationship between the residual ridge and satisfaction. Evaluation of patients acceptance and satisfaction with complete denture can be rated by various methods including number of corrections after insertion, psychological

characteristics of patients, self evaluation of quality of life, demographic and socioeconomic factors, patient expectation of dentures, quality of denture construction, occlusal factors, factors that are connected with anatomic and physiologic characteristics of the patient.<sup>10,15</sup> Studies have shown that patient satisfaction with complete denture is not only based on the technical quality of the dentures but also on a product of underlying latent variables which includes anatomical factors and anatomical forms.<sup>15,7</sup>

The shape of maxillary residual ridge using objective assessment showed that there is significant association between maxillary residual ridge and satisfaction with denture. Subjects with U shaped maxillary residual ridge were satisfied with their dentures. Those with UV and V shaped maxillary residual ridge were the least satisfied with their dentures. These groups with UV and V shaped residual ridge are as a result of marked and severe resorption.<sup>11</sup> Most (54.55%) of the subject who had U

**Table 2.** Association between mandibular residual ridge and self perceived satisfaction.

Basal Seat Characteristics	Self Perceived Satisfaction		Total	P value
<b>Mandibular edentulous ridge (subjective assessment)</b>	Satisfied	Not Satisfied		1
U shaped	4 (21.05%)	3 (15.79%)	7 (36.84%)	
UV shaped	2 (10.53%)	1 (5.26%)	3 (15.79%)	
V shaped	6 (31.58%)	3 (15.79%)	9 (47.37%)	
<b>Mandibular edentulous ridge (objective assessment)</b>				0.31
U shaped	10 (52.63%)	4 (21.05%)	14 (73.68%)	
UV shaped	2 (10.53%)	3 (15.79%)	5 (26.32%)	
Total	12 (63.16%)	7 (36.84%)	19 (100%)	
<b>Vestibular depth (maxilla)</b>				0.57
Adequate	13 (59.09%)	5 (22.73%)	18 (81.82%)	
Inadequate	2 (9.09%)	2 (9.09%)	4 (18.18%)	
Total	15 (68.18%)	7 (31.82%)	22 (100%)	
<b>Vestibular depth (mandible)</b>				1
Adequate	11 (57.89%)	7 (36.84%)	18 (94.74%)	
Inadequate	1 (5.26%)	0 (0%)	1 (5.26%)	
Total	12 (63.16%)	7 (36.84%)	19 (100%)	

**Table 3.** Salivary viscosity and self-perceived satisfaction.

Salivary viscosity	Self perceived satisfaction		Total	p-value
	Satisfied	Not satisfied		
<b>Normal</b>	13 (54.17%)	7 (29.17%)	20 (83.3%)	1
<b>Thick and ropy</b>	1 (4.17%)	-	1 (4.17%)	
<b>Thin and watery</b>	2 (8.3%)	1 (4.17%)	3 (12.5%)	
<b>Total</b>	16 (66.7%)	8 (33.33%)	24 (100%)	

shaped maxillary residual ridge were satisfied with their denture, those who had U (1%) and UV (18.18%) shape were not satisfied with their dentures. It has been stated that U shaped residual ridge is the most ideal ridge in terms of retention and stability.<sup>11</sup> U shaped residual ridge denote mild to moderate resorption.<sup>11</sup> Our findings conforms to that of earlier study<sup>4</sup> which states that alveolar bone resorption in maxilla was not as pronounced as that of the mandible. This maxillary ridge finding is similar to a study<sup>16</sup> which found a correlation between quality of ridge and satisfaction.

The reason for our maxillary ridge finding might be as a result of the effect of gravity on the maxillary arch which has been stated to be an unopposed downward movement which usually occurs in upper denture.<sup>17</sup> This effect will be more pronounced in subject with UV and V shaped residual ridge. This invariably affects retention and stability which could result in discomfort and dissatisfaction of the denture.

Our findings also show that objective assessment of mandibular residual ridge classified most subjects as having V shape residual ridge. V shape residual ridge denotes marked resorption.<sup>11</sup> Alveolar bone loss in the mandible as been stated to be pronounced and 4 times more than in the maxilla.<sup>4</sup> There was no significant association between the shape of mandibular residual ridge and satisfaction. This could be that the lower denture weight constitutes negligible gravitational force that is insignificant in comparison with the other forces acting on the denture. It may however, be beneficial as retentive force.<sup>17</sup> Other anatomic forms such as shape of mandibular residual ridge, shape of palatal vault and vestibular depth had no significant association with satisfaction of denture.

The method used for assessing vestibular depth<sup>13</sup> had its limitation of obscurity with the reference scale. This reference scale was modified in this study to eliminate any obscurity. The palatal vault, mandibular ridge, vestibular depth findings are similar to earlier studies which state that clinical assessment and anatomic factors do not correlate with satisfaction of complete denture.<sup>18,10</sup> Further study will have to be done on a larger population of edentulous patient.

The use of objective analysis in assessing residual ridge resulted in interpretation of significant association between the maxillary residual ridge and satisfaction of complete denture, which was not interpreted with objective analysis. This shows that the use of our objective assessment was more sensitive and it is therefore suggested as a better method of classifying residual ridge than the use of visual examination.

## CONCLUSION

This study found a significant association between shape of maxillary residual ridge and satisfaction of complete denture. Preclinical assessment of maxillary residual ridge helps in predetermining self perceived satisfaction of complete denture wearers. U shaped maxillary residual ridge gives more self perceived satisfaction. Objective assessment of residual ridge is also advised.

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