

COMPARISON OF ORAL STEREOGNOSIS IN SATISFIED AND DISSATISFIED PATIENTS WITH THEIR COMPLETE DENTURE THAT ARE PROFESSIONALLY ASSESSED AS BEING GOOD AND POOR – A CLINICAL STUDY.

Clinical Research

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ABSTRACT

Background: Oral stereognosis is defined as the identification of forms solely through the use of oral receptors. High oral perception is thought to contribute the poor adaptation to dentures.

Aim- The aim of this study was to know the difference in oral perception among satisfied and dissatisfied patients who had dentures that were professionally assessed as poor and good.

Method : Patients who were edentulous for an average of ten years and had received their existing prosthesis 2-5 years before the study. This study was done using three parameters. For assessing patients opinion about their dentures, a questionnaire was made, quality of the denture was assessed by three prosthodontists using a check list on a three point scale and oral stereognosis was assessed using ten different test forms.

Results : Results showed that patients who were satisfied with their dentures which were assessed as poor had less stereognostic perceptive score and patients who were dissatisfied with their denture even if their dentures were good had high stereognostic value.

Conclusion : Statistical analysis confirmed that oral stereognosis plays an important role in satisfaction and dissatisfaction of the patients towards their denture.

KEYWORDS

check list ,Oral stereognosis, test form.

Introduction

The physiologic function of the masticatory system is primarily dependent upon the integration of sensory feedback and motor neuron response.¹

The tactile determination of form without the aid of vision is known as stereognosis.²

Stereognosis has been employed to evaluate the integrity of sensory feedback and is used in neurological evaluation of the central nervous system.³

The neurologic evaluation of central nervous system integrity frequently employs stereognostic tests, i.e. tactile – kinesthetic recognition of form without the aid of vision. The patient is required to identify familiar objects by hand manipulation with the eyes closed. Tactile stimulation produces an awareness to the presence of stimulus.⁴

McDonald and Aungst stated that the development of oral stereognostic tests which permitted active exploration of the stimulus applied seemed to be the most promising method to evaluate oral sensorimotor function.⁵ Oral stereognosis is used to investigate the relationship of oral perception to diagnostic and therapeutic procedures in dental treatment. It compares level of oral discriminatory skill to age, to the presence or absence of teeth, to speech articulation and to patient evaluation of their prosthesis.⁴

In response to an external need for information on the patient satisfaction and denture performance, several studies have been done. Many techniques have been utilized, including discriminations of thickness, hardness, texture, size and oral manipulative ability. These studies have had inconsistent results, with alteration in oral sensory abilities.

“Adaptation and adjustment to the dentures” play an important role in patient satisfaction with complete dentures. In this respect the investigators are looking for possible “barriers” in patients adaptation and adjustment to dentures as a cause of dissatisfaction. One of these barriers might be oral perception which should be more intolerant to the limitation of dentures in general and to small errors in denture fabrication than patient with a lower level of oral perception.⁶

The development of oral stereognostic tests which permits active exploration of stimulus applied seems to be the most promising method to evaluate oral sensor-motor function. When the functions of speech, mastication and general comfort are used as criteria for comparison, some patients with clinically acceptable complete denture will function poorly and others will function well. Even in

patient who have obvious clinical shortcoming in their dentures, there are degrees of success in patient performance.⁴

Hence this study was conducted to know any difference exists in oral perception among satisfied and dissatisfied patients with dentures.

Method :

The present in-vivo study was carried out in the department of prosthodontics. Thirty edentulous denture wearing patients were randomly selected for the study, among them 17 were male patients and 13 were female patients. Their age ranged from 57 – 84 years and their mean age was 75.5 years. They were edentulous for an average of 10 years and had received their prosthesis 2-5 years before the investigation. Patients were given a brief explanation of study and their consent was obtained.

Patient's opinion about their dentures, patient's oral stereognosis scores, and information regarding the technical quality of the dentures were collected in the following way ; A) Assessment of patient's opinion on their denture.

B) Assessing the quality of the denture by three prosthodontists.

C) Assessing the oral stereognosis by different forms of acrylic sheets.

A) Assessment of patient's opinion on their denture :

Patients were requested to complete a questionnaire regarding their opinion on appearance, retention, comfort and chewing efficiency of the denture. These questionnaire was designed to show a semi quantitative degree of satisfaction with their denture. The overall satisfaction by the patient regarding the above said factors were scored on a three point scale : Good, fair and bad.

B) Assessing the quality of the denture by three prosthodontists :

Quality of the denture was assessed by three prosthodontists using a check list with the following factors : occlusion, articulation, interocclusal distance, retention, stability and border length of the denture. After completing these assessments by the prosthodontists, the quality of the dentures was assessed on a three point scale : Good, fair and poor.

C) Assessing the oral stereognosis by different forms of acrylic sheets:

For assessing the oral stereognosis, ten different test forms that is five large and five small examples of a triangle, a square, a circle, a rectangle and a semicircle were used. These were made of 1mm thick plastic, with a diameter of 10-12 mm for large test forms and 5-6 mm for small test forms. After removing the patient's dentures, the test forms were placed on the tongue using a forcep and patient was asked

to describe each test form after manipulating them in the mouth. The patients were permitted to move the test forms in the mouth during the identification.

A dentist scored the answers on a three point scale : 1 point if the answer was correct, 2 points if the answer was partly correct, 3 points if the answer was wrong. The answers given by patient on each form were then summed.

Hence, each subject will receive a total stereognosis score varying from 10 for all answers correct and 30 for all answers wrong.

RESULTS

Aim of the present in vivo study was to compare the oral stereognosis in satisfied and dissatisfied patients whose dentures were assessed by three prosthodontist.

This study was conducted by using three parameters that is patients satisfaction towards their dentures using a questionnaire, quality of the denture assessed by three prosthodontist by using a check list on a three point scale, oral stereognosis of the patient by using different test forms.

Statistical analysis :

Descriptive data are presented as number and percentages for each subgroups. Chi square test was used for analysis of categorical data. p-value of 0.05 or less was used for statistical significance.

From each of the patient responses were collected by asking the relevant questions on their perception regarding dentures.

Table 1 and Graph 1 :

Table 1 shows patients opinion regarding satisfaction of complete dentures with various parameters.

Out of 30 study subjects, regarding the appearance of the denture 26.7% showed score 1(good) followed by score 2 (fair) with 33.3%. A majority of 40% subjects expressed appearance of denture to be 3(poor).

In case of retention of maxillary denture, majority of the study subjects 43.3% showed score 3 (poor), 40% showed score 2(fair) and in only 16.7% of the study subjects showed score 1 (good).

In case of retention of mandibular denture, majority of the study population 53.4% showed score 2 (fair), 33.3% showed score 1(good) and the least being 13.3% with score 3 (poor).

In case of chewing efficiency of the denture 46.7% of the study population showed a maximum score of 3 (poor), 43.3% showed score 1(good) and 10% showed a fair satisfaction (score 2).

Regarding the comfort of the denture in maxillary denture 46.7% of the subjects expressed a score of 3 (poor), 30% showed score of 2(fair) while 23.3% of the study subjects showed score of 1 (good).

In mandibular denture 50% of the subjects expressed a maximum score of 2 (fair), 36% showed score 1(good) and the least being with score 3 (13.3%).

Table 2 : shows the quality of dentures assessed by prosthodontists. The quality was assessed in terms occlusion, articulation, interocclusal distance, border length of denture, stability and retention of maxillary and mandibular denture. The difference in observation of the above parameters were not statistically significant ($P>0.05$).

Table 3 and Graph 2 : shows the agreement between three prosthodontists for all questions, all three prosthodontists agreed for good in 97, fair in 57, and poor in 87 of the cases. There was only slight disagreement between the three prosthodontists which was not significant.

Table 4 and Graph 3 : shows the overall assessment by three prosthodontists. The agreement in assessment among the prosthodontists was 0.82.

Table 5 and Graph 4 & 5 :

Of the total of 30 subjects, 2 subgroups were selected. The first group consisted of 15 subjects whose dentures were assessed as being bad,

but who were satisfied with them. These people objectively had reasons to complain about their dentures but did not. The second group consisted of 15 patients whose dentures were assessed as good but who were nevertheless dissatisfied with them.

Objectively there individuals have no apparent reasons to complain but they had many problems. The difference in the oral stereognosis scores between satisfied group with bad denture and dissatisfied group with good denture is given below.

This table shows the comparison of oral stereognosis between satisfied and dissatisfied subjects. The difference in oral stereognosis with large test form and small test form among satisfied and unsatisfied subjects was statistically significant with $P<0.05$.

With large test form only 13% of the satisfied group could identify the triangle correctly while other test forms, they identified wrongly with an average of 77%.

With small test form an average of 13.3% among satisfied group could correctly identify small circle, triangle and square test forms while with all test forms, an average of 74.4% identified wrongly.

With large test form only 7% of the unsatisfied group identified the rectangle wrongly while other test forms, they identified correctly with an average of 88%.

With small test form with all test forms among unsatisfied group, an average of 80% could correctly identify while only 7% with rectangle test form identified it wrongly.

Table 1 : Patient satisfaction

Particular	Score		
	1 (Good)	2 (Fair)	3 (Poor)
Q1	8 (26.7%)	10 (33.3%)	12 (40%)
Q2	5 (16.7%)	12 (40%)	13 (43.3%)
Q3	10 (33.3%)	16 (53.4%)	4 (13.3%)
Q4	13 (43.3%)	3 (10%)	14 (46.7%)
Q5	7 (23.3%)	9 (30%)	14 (46.7%)
Q6	11 (36%)	15 (50%)	4 (13.3%)

Table 2: Prosthodontists assessment

	Score	Prosthodontist 1	Prosthodontist 2	Prosthodontist 3	P value
Occlusion	1	-	-	-	0.96
	2	15	16	15	NS
	3	15	14	15	
Articulation	1	-	1	-	0.66
	2	18	15	17	NS
	3	12	14	13	
Interocclusal distance	1	1	-	2	0.68
	2	21	20	19	NS
	3	8	10	9	
Border length of maxillary dental	1	15	15	14	0.99
	2	3	3	4	NS
	3	12	12	12	
Border lengths of mandibular	1	15	15	16	0.99
	2	13	3	2	NS
	3	12	12	12	
Retention of maxillary denture	1	14	15	16	0.94
	2	4	3	2	NS
	3	12	12	12	
Retention of mandibular denture	1	15	15	15	0.99
	2	3	4	3	NS
	3	12	11	12	
Stability of mandibular denture	1	14	14	15	0.99
	2	4	4	4	NS
	3	12	12	11	
Stability of maxillary denture	1	15	15	15	1.00
	2	3	3	3	NS
	3	12	12	12	

Table 3 : Agreement between 3 prosthodontist

Score	Prosthodontist 1	Prosthodontist 2	Prosthodontist 3
1	87	1	-
2	1	57	4
3	-	4	97

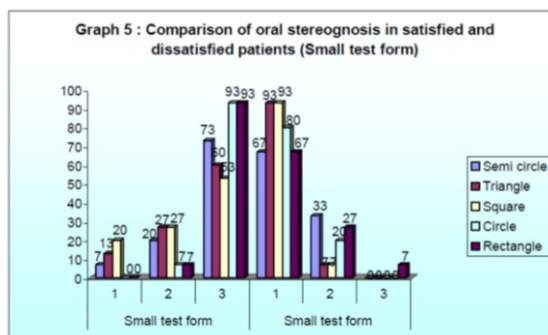
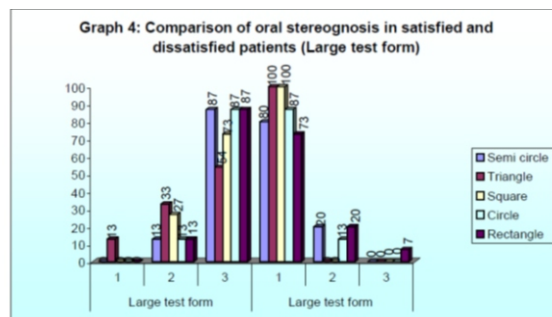
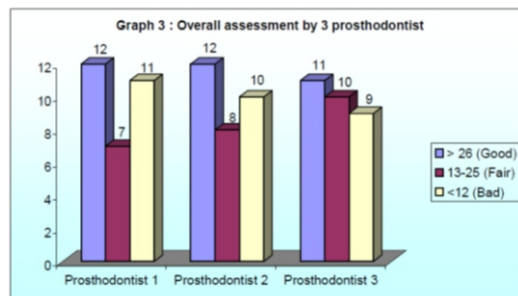
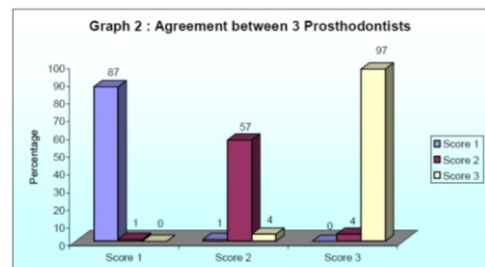
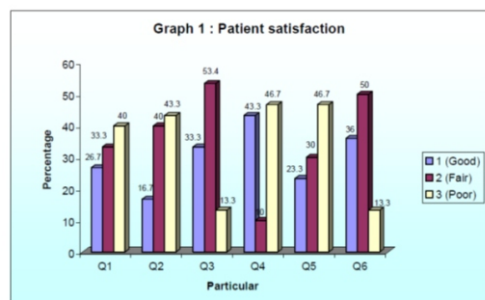
Table 4 : Overall assessment by 3 prosthodontists

	Prosthodontist 1	Prosthodontist 2	Prosthodontist 3
> 26 (Good)	12	12	11
13-25 (Fair)	7	8	10
≤ 12 (Bad)	11	10	9

$\chi^2 = 0.82$, $P = 0.94$ NS

Table 5 : Comparison of oral stereognosis in satisfied and dissatisfied patients

	Patient scores						χ^2	P
	Satisfied			Unsatisfied				
	Large test form			Large test form				
	1	2	3	1	2	3		
Semi circle	-	2 (13%)	13 (87%)	12 (80%)	3 (20%)	-	25.2	< 0.001
Triangle	2 (13%)	5 (33%)	8 (54%)	15 (100%)	-	-	10.9	< 0.01
Square	-	4 (27%)	11 (73%)	15 (10%)	-	-	22.9	< 0.001
Circle	-	2 (13%)	13 (87%)	13 (87%)	2 (13%)	-	30.0	< 0.001
Rectangle	-	2 (13%)	13 (87%)	11 (73%)	3 (20%)	1 (7%)	26.0	< 0.001
	Small test form			Small test form				
	1	2	3	1	2	3		
Semi circle	1 (7%)	3 (20%)	11 (73%)	10 (67%)	5 (33%)	-	18.8	< 0.001
Triangle	2 (13%)	4 (27%)	9 (60%)	14 (93%)	1 (7%)	-	19.8	< 0.001
Square	3 (20%)	4 (27%)	8 (53%)	14 (93%)	1 (7%)	-	16.9	< 0.001
Circle	-	1 (7%)	14 (93%)	12 (80%)	3 (20%)	-	27.0	< 0.001
Rectangle	-	1 (7%)	14 (93%)	10 (67%)	4 (27%)	1 (7%)	23.1	< 0.001



Discussion

Dentists consider dentures successful when they meet certain technological standards. However, patient evaluate dentures from the point of view of their own satisfaction. The ability of the patient to use the dentures for mastication or speech, considerations of esthetics, psychologic factors, and the attitude of the patient all inference his ability to adjust to, accept, and even manipulate the dentures. Thus, the satisfaction of the patient is a strong determinant of success in complete denture service.⁷

Problems with complete denture use are common. Many patients complain about the lack of retention and stability, and they may have pain and problems with mastication. Studies of the causes of their problems have shown different results. The technical quality of the dentures and the condition of the oral structures play a part, but to a great extent cannot explain the differences in dissatisfaction.⁶

A diminished capability of adaptation often complicates the prosthetic treatment of the elderly person. There are various methods available to evaluate oral perception, such as testing of the ability to localize objects placed in the oral cavity.

The ability to recognize three dimensional forms and shapes (oral stereognosis) requires a special combination of stimulation of tactile and pressure receptors and the proprioceptors of the muscles. The influence of oral stereognostic ability on adaptation is complex and still not fully understood. On one hand, high oral stereognosis intensifies the patient's attention to minor surface irregularities that occur in the fabrication of any denture. Tactile sensibility may also support the detection of minor occlusal interferences. These irritations might lead to adaptation problems or dissatisfaction on the other hand, oral perception enhances purposeful coordination of muscular movements of the orofacial system and therefore supports the adaptation process.⁸

Thus this study was conducted to compare the oral stereognosis in satisfied and dissatisfied patients with their complete denture that were professionally assessed as being good and poor.

For assessing patients opinion about their dentures, a questionnaire was made concerning appearance, chewing efficiency, comfort and retention with maxillary and mandibular denture.

Quality of denture was assessed by three prosthodontist using a check list.

After completing this assessment a general impression about the quality of the dentures is made on a three point scale that is good, fair and poor.

Oral stereognosis was assessed by using ten different test forms (five large and five small) in the shape of a triangle, a square, a semicircle, a circle and a rectangle.

The oral stereognosis test provides information related to the oral discriminatory skill of a patient.

The results of this study showed that most of the patients were able to describe the large test forms well with an average "correct" score of 45.3%. The triangle and square appeared to be easier to identify than, for instance, the semicircle, which presented a problem for 61.7 % of the subjects. There were greater difference for the small test forms. Only 38.3 % could correctly describe the semicircle. In all instances, the average scores of the small forms were lower than the score for the large form.

This outcome was well supported by study done by **Van Aken (1991)**⁶. He assessed that patients were able to describe the large test forms well with an average of 63 %.

Semicircle presented a problem for 53 % of the subjects. Only 14 % could correctly describe the semicircle.

The area of patient acceptance and evaluation of their prosthesis showed some interesting trends. The clinical implications are present even though some of the data may not have been statistically significant because of the size of the sample. The results showed, as expected, that the subjects with higher stereognostic scores reported more problems. The comments for these subjects were specific and more dissatisfied denture subjects showed the highest mean stereognostic scores. Also, the dissatisfied denture subjects showed the highest mean stereognostic scores, and subjects who reported absolutely no problems had the lowest mean stereognostic scores. This outcome was well supported by the study done by **Harold Litvak (1971)**⁴.

The denture quality was rated mostly fair to good and was not directly linked to patient satisfaction. The denture quality plays only a moderate role in patient's satisfaction and the variables of the physical condition of the mouth examined had little influence on denture satisfaction which were in agreement with **Van Waas(1991)**.⁶

CONCLUSION

The basic concept of this study was to assess the oral stereognosis in satisfied and dissatisfied patients who had dentures that were assessed as good, fair and poor.

On the basis of findings and within the limitations of the present study, following conclusions were drawn .

- 1) Majority of the patients were not satisfied with the appearance of dentures.
- 2) In case of retention of maxillary and mandibular denture, majority of patients were satisfied with the lower denture.
- 3) Regarding chewing efficiency, the study population was satisfied in majority of cases.
- 4) Regarding comfort of maxillary and mandibular denture, majority of patients were satisfied with maxillary denture.
- 5) The three prosthodontist taken in the study showed no difference in observation and results were not statistically significant.
- 6) The difference in oral stereognosis with large test form and small test form among satisfied and dissatisfied subjects were statistically significant.
- 7) The satisfied group of patients with large test forms were not able

identify triangle correctly in majority of cases.

- 8) The satisfied group of patients with small test forms were able to identify circle and rectangle better than other test forms.
- 9) Among unsatisfied group with large and small test forms the patients were able to identify rectangle better than other test forms.
- 10) The oral stereognosis test presented, based on the recognition in the mouth of five large and five small examples of a triangle, a square, a circle, a rectangle, and a semicircle, is a reliable test for measuring patient's oral stereognostic perception.

The result showed that the oral perception in patients who were satisfied with their denture which were assessed by prosthodontists as poor have low degree of oral perceptive value that is low oral stereognostic score and patients who were dissatisfied with their dentures which were assessed by prosthodontists as good have high degree of oral perceptive value that is high stereognostic score.

The critical evaluation of a prosthesis should include not only all of the dentist's objective skills of treatment, and the patient's subjective judgment about oral health, function, and esthetics, but also the patient's oral perceptive skills. It would seem that future research concerned with patient acceptance and response should explore further both a practical and valid approach to testing oral sensation and perception.

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