

Evaluation of Oral Perception In Relation To Tactile Ability and Patient Satisfaction in Complete Denture Patients

¹Dr. Ajay Mootha, ²Dr. Priyanka Patil

Department of Prosthodontics, YCMM and RDFs Dental College, Ahmednagar, Maharashtra, India.

Corresponding Author: Dr. Priyanka Patil, Department of Prosthodontics, YCMM and RDFs Dental College, Ahmednagar, Maharashtra, India.

Citation of this Article: Dr. Ajay Mootha, Dr. Priyanka Patil , “Evaluation of Oral Perception In Relation To Tactile Ability and Patient Satisfaction in Complete Denture Patients”, IJDSIR- July - 2020, Vol. – 3, Issue -4, P. No. 304 -311.

Copyright: © 2020, Dr. Priyanka Patil, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License. Which allows others to remix, tweak, and build upon the work non commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: Patients using complete dentures do not have periodontal receptors; thus, the perception functions of these patients in the oral cavity are reduced compared with those having natural teeth. However, patients get adapted to the denture with time so the purpose of this study was to investigate the oral perception ability of patients with time and their correlation with patients' satisfaction in complete denture patients.

Methods And Materials: 30 edentulous patients were included in this study who required complete denture fabrication treatment with age group between 40-70. The tactile ability of patients in relation to different thicknesses of an object was used to check the perception ability of edentulous patients before treatment, thirty minutes after the denture placement, and one month after denture placement and their co-relation with patients satisfaction and comfort level were evaluated by questionnaires method.

Result And Conclusion: Statistical analysis was carried out using the chi-square test. It was observed that patients

with less oral perception ability were more satisfied with the denture.

Keywords : Oral Perception, Tactile Ability, Patient Satisfaction

Introduction

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. These complete denture problems are either due to errors during the clinical procedure or the condition of the oral structures. There are reasons to assume that "adaptation and adjustment to the dentures" also play a vital role in patients' satisfaction with complete dentures. ^[1] There are possible "hurdles" in patients' adaptation and adjustment to dentures as a reason for dissatisfaction. One of these hurdles might be oral perception; in various studies, this phenomenon was investigated by oral stereognosis and tactile ability. Stereognosis has been defined as the appreciation of the form of objects by palpation. It was first introduced by Berry and Mahood (1966). ^[2] Tactile sensibility defined as the ability to recognize test pieces

between antagonistic teeth. This method was given by theil (1931).^[3] These oral tactile skills of individuals provide important data to dentists.^[4,5] This test provides information about a patient's oral disintegration ability.^[6,7] Performing these tests takes little time, and no special treatment is required by the clinician.^[7,8] Clinicians use this information to assess how patients will respond during and after treatment.

- So the aim and objectives of the present study were to: To determine and compare the oral tactile sensibility just before (denture insertion), 30 min after (30 min post denture insertion), and 1 month after (1- month post-treatment) insertion of complete dentures.

Materials and Methods

Following institutional ethical committee approval and obtaining informed consent from the patients, the oral perception tests (OPT) was performed on thirty edentulous patients in the age group of 40–70 years, reporting to the department of Prosthodontics Y.C.M.M. Dental College and Hospital, Ahmednagar. The patients were non-experienced denture wearers.

Inclusion Criteria

- Edentulous patients undergoing complete denture fabrication treatment
- Absence of any signs of inflammation and oral mucosal diseases
- Average age group between 40-70 years
- Absence of history of temporomandibular joint disorder

Exclusion Criteria

- Patients with neuromuscular in co-ordination
- Poorly fitting dentures
- Any experience of denture usage

Four different thicknesses of test samples were used to assess oral perception ability. The samples were made with acrylic having a thickness of 0.3, 0.5, 1, 1.5 mm

(1×1 cm) in size (fig. 1 and 2). The National Institute of Dental Research had developed a range of 20 shapes ^[9] and suggested to use test forms within this range for the assessment of oral stereognosis, as the task was to identify the thickness of an object and not the shape so the square-shaped specimen was chosen.

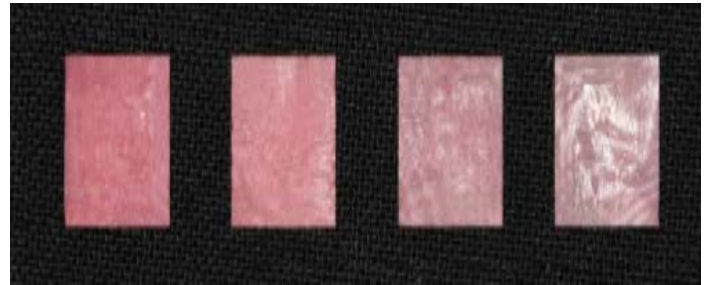


Fig. 1: Test specimen with different thickness

The small specimens were placed on each subject's tongue with the help of tweezers (fig.3) and were told to freely manipulate the object in the mouth. The patient was asked to recognize the different thickness of the sample in their order. The test was carried out in a quiet environment in the college where the subject was seated comfortably in an upright position. The test was conducted before denture insertion; 30 min after denture insertion and after 1-month post denture insertion. To prevent the learning effect, no practical trials were held. For each of the tests, an object was placed in random order, and each object was presented once to the patient. At each stage following questionnaire was asked (fig.4) to the subjects and grading was given accordingly. The data gathered were analyzed using SPSS software (version 17). A Chi-square test was used to compare the Oral perception Ability scores between the groups. $P < 0.05$ was set for statistical significance.

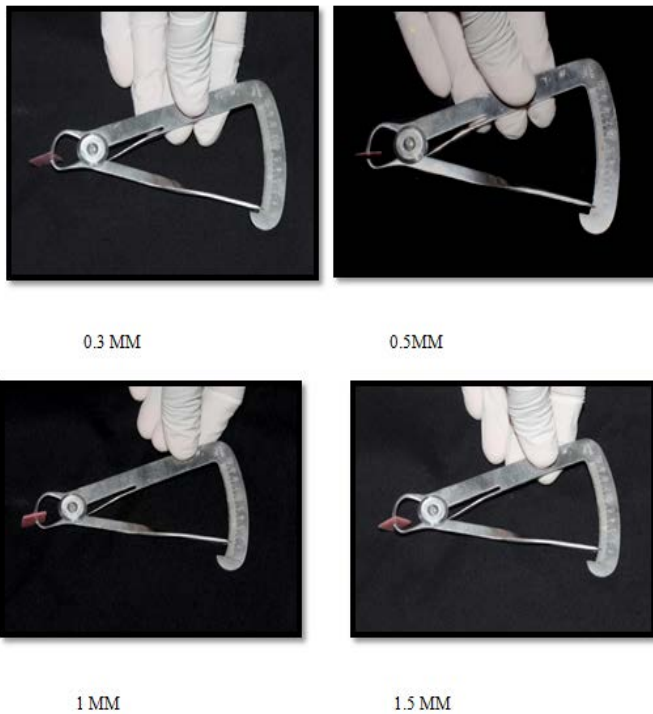


Fig. 2 Measurement With Wax Guage



Fig. 3: Oral Manipulation of Test Samples with or Without Denture

Fig. 4: Questionnaire format.

Phase 1

- Do you feel any object in the mouth?
1. Yes 2.No
- Do you feel any changes in thickness of an object?
1. Yes 2. No
- Can you grade different thickness of an object?

0.3mm	0.5mm	1mm	1.5mm

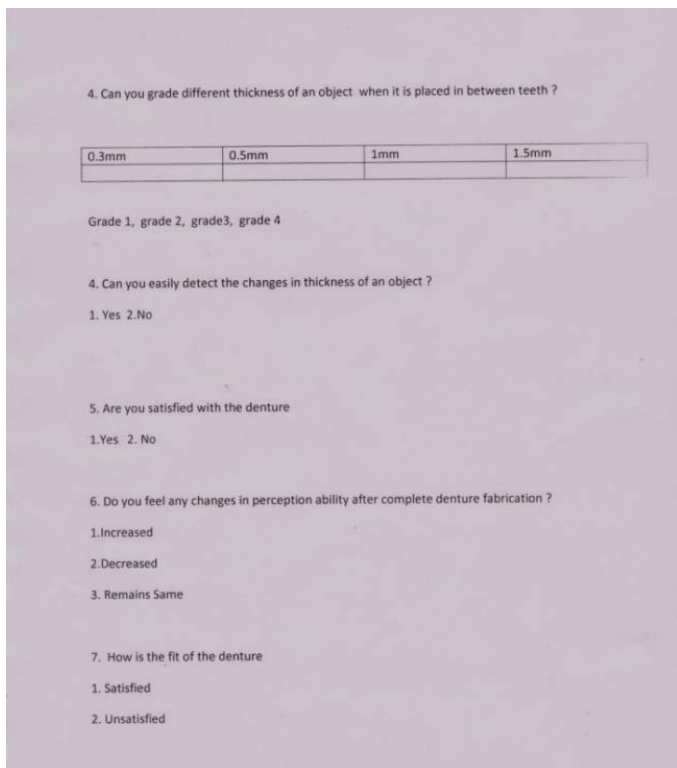
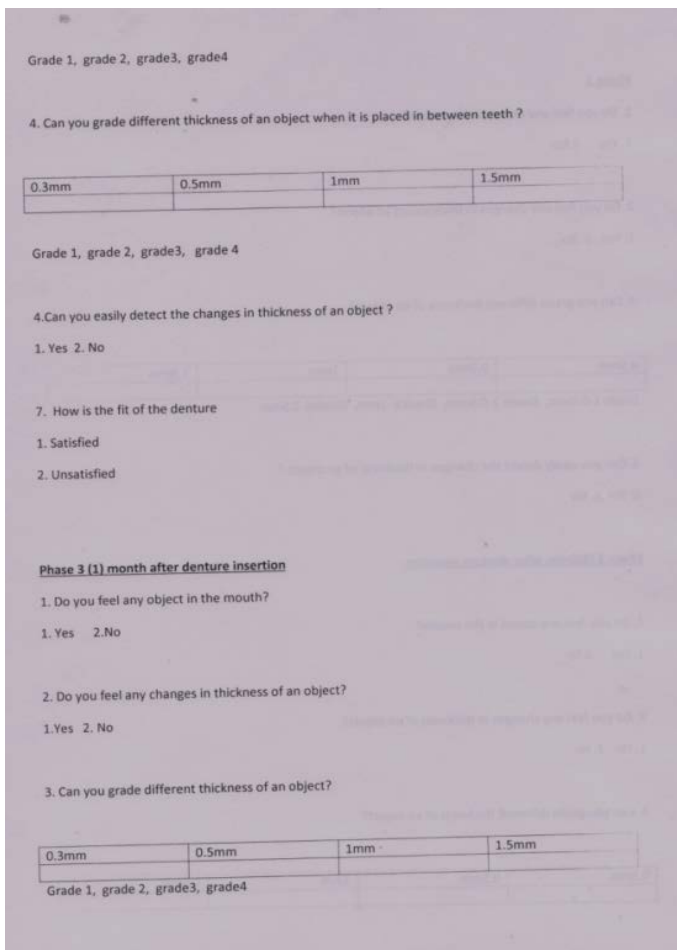
Grade 1-0.3mm, Grade 2-0.5mm, Grade3 -1mm, Grade4-1.5mm

- Can you easily detect the changes in thickness of an object ?
1. Yes 2. No

Phase 2 (30)min. after denture insertion

- Do you feel any object in the mouth?
1. Yes 2.No
- Do you feel any changes in thickness of an object?
1. Yes 2. No
- Can you grade different thickness of an object?

0.3mm	0.5mm	1mm	1.5mm



Results

The results of the tactile ability test at Phase I, phase II, and phase III are shown in Table.

Table 1: The Co-Relation between Phase II and satisfaction

	0	1	All
0	3	9	22
1	2	6	8
All	5	25	30

Chi-Square = 0.545, DF = 1, P-Value = 0.460 > 0.05

Phase II and satisfaction are not related

Table 2: The Co-Relation Between phase III and Satisfaction

	0	1	All
0	2	21	23
1	3	4	7
All	5	25	30

Chi-Square = 4.509, DF = 1, P-Value = 0.034 < 0.05

2 cells with expected counts less than 5.0

Between III and satisfaction are related

Table 3: The Co-Relation between Phase I and Perception Level

	-1	0	1	All
0	18	4	3	25
1	2	3	0	5
All	20	7	3	30

Chi-Square = 4.697, DF = 2 p value = 0.0955 > 0.05

No relation

Table 4: The Co-Relation between Phase II and Perception Level

	-1	0	1	All
0	17	3	2	22
1	3	4	1	8
All	20	7	3	30

Chi-Square = 4.785, DF = 2 p value = 0.0918 > 0.05

No relation

Table 5: The Co-relation between phase III and oral perception ability

	-1	0	1	All
0	20	0	2	22
1	0	7	1	8
All	20	7	3	30

Rows: Phase III (0- subjects not identified the thickness of an object, 1- a subject who correctly identified the thickness of an object)

Columns: Perception (-1 – perception ability decreased, 0- remains same, 1- perception ability increased)

Chi-Square = 26.591, DF = 2 p value = 0.000 < 0.05

Strong relation

Table 6: The Co-relation between phase III (B) and oral perception ability

	-1	0	1	All
0	18	3	2	23
1	2	4	1	7
All	20	7	3	30

Chi-Square = 6.628, DF = 2 p value= 0.0363 < 0.05

Related

Table 7: The Co-relation between Perception Level and Satisfaction

Rows: Perception Columns: Satisfaction

	0	1	All
-1	1	2	3
0	4	20	24
1	0	3	3
All	5	25	30

Chi-Square = 1.200, DF = 2 P value = 0.5488 > 0.05

No relation

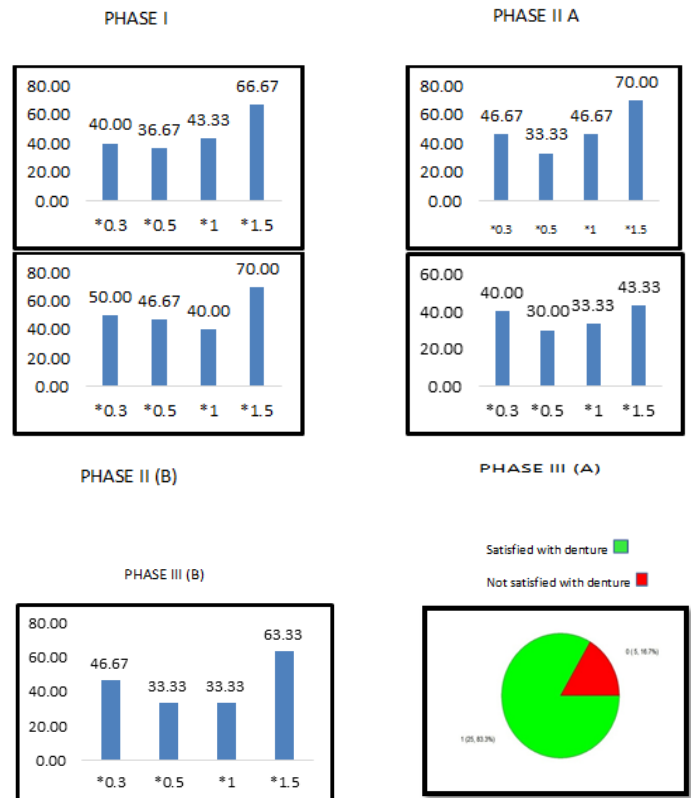


Fig. 5: % of the People Identified the Test Sample

Result

The present study evaluated OPA using acrylic objects before denture insertion, 30 min after denture insertion, and after 1 month of insertion of dentures in non-experienced denture wearers. The above bar diagram showed that % of people correctly identified the thickness of the test sample at each stage (fig 5). 1 month after complete denture insertion there was only a 10% rise in perception ability is seen which was statistically insignificant. Out of 30 patients, 5 patients were not satisfied with the denture and among these, 3 patients correctly identified the thickness of the test sample in sequence. Thus there are more chances that a person with high oral perception ability is not satisfied with the denture. However, there was no statistical correlation between phase II and perception ability and patient satisfaction. Statistically, there was no correlation between patients' satisfaction and perception ability. Thus the null hypothesis is accepted. Also, phase III and perception

ability and patient's satisfaction were statistically correlated.

Discussion

The physiologic function of the masticatory system is primarily depending upon the co-ordination of sensory receptors and motor neuron response. And thus the patients with high oral perception have the chance of high proprioception ability that act to program and monitor the motor responses.^[7] Out of 30 subjects only 7 patients were identified the test samples. There was a strong statistical correlation between tactile sensibility and patient's satisfaction that couldn't identify the test sample. There was only a 10% increase in tactile sensibility after complete denture fabrication which is statistically insignificant. The loss of sensory perception may cause the elderly patients to swallow larger food bolus—implying that they cannot accurately estimate the bolus size and shape. Some studies show that older patients and those who have been edentulous for a long time are more often satisfied." Sheppard et al" showed that "the tolerance for dentures appears to increase, despite continuing retrogressive oral changes, the longer the dentures are worn.^[10] Older and edentulous people appeared to have more problems in identification. Within the edentulous groups, some investigators sought to identify differences between satisfied and dissatisfied patients. Berry and Mahood,^[2]" Litvak et al ^[11]" found that patients with denture problems had a higher mean score in oral stereognosis (i.e., a higher level of oral perception) than patients without denture problems. Litvak et al also found that patients with high oral stereognosis scores had more denture problems. This is because high oral perception intensifies the patient attraction to minor surface irregularities that occur in the fabrication of any denture and these irregularities lead to adaptation problems and dissatisfaction.

Conclusion

Within the limitation of this study, the patients with less oral perception ability are more satisfied with a denture. A negligible percentage of the study population claimed that Perception ability is slightly increased after rehabilitation with the denture. During the study, it was observed that full palatal coverage may not influence oral perception ability. I.e. presence of palatal coverage does not increase or decrease the oral reorganization ability.

References

1. Van Aken AA, Van Waas MA, Kalk W, Van Rossum GM. Differences in oral stereognosis between complete denture wearers. *International Journal of Prosthodontics*. 1991 Jan 1; 4(1).
2. Berry DC, Mahood M (1966) Oral stereognosis and oral ability in relation to prosthetic treatment. *Br Dent J* 120:179–185 2.
3. Gerd Tryoe, Ove Frydenberg & Niels Brill An Assessment of the Tactile Sensibility in Human Teeth: An Evaluation of a Quantitative Method. *Acta Odontologica Scandinavica*, 20:3, 233-256.
4. Owall B, Vorwerk P. Analysis of a method for testing oral tactility during chewing. *Odontologisk revy*. 1974; 25(1):1.
5. Van Loven K, Jacobs R, Swinnen A, Van Huffel S, Van Hees J, van Steenberghe D. Sensations and trigeminal somatosensory-evoked potentials elicited by electrical stimulation of endosseous oral implants in humans. *Archives of oral biology*. 2000 Dec 1; 45(12):1083-90.
6. Batista M, Bonachela W, Soares J. Progressive recovery of osseoperception as a function of the combination of implant-supported prostheses. *Clinical oral implants research*. 2008 Jun; 19(6):565-9.

7. Jacobs R, Van Steenberghe D. Comparative evaluation of the oral tactile function by means of teeth or implant-supported prostheses. *Clinical oral implants research*. 1991 Apr;2(2):75-80.
8. Grasso JE, Catalanatto FA. The effects of age and full palatal coverage on oral stereognostic ability. *Journal of prosthetic dentistry*. 1979 Feb 1; 41(2):215-9.
9. Meenakshi S, Gujjari AK, Thippeswamy HN, Raghunath N. Evaluation of oral stereognostic ability after rehabilitating patients with complete dentures: in vivo study. *The Journal of Indian Prosthodontic Society*. 2014 Dec 1; 14(4):363-8.
10. Sheppard IM, Schwartz LR, Sheppard SM. Survey of the oral status of complete denture patients. *The Journal of prosthetic dentistry*. 1972 Aug 1;28(2):121-6.
11. Litvak H, Silverman SI, Garfinkel L (1971) Oral stereognosis in dentulous and edentulous subjects. *J Prosthet Dent* 25:139–15
12. Smith PW, McCord JF. Oral stereognostic ability in edentulous and dentate individuals. *The European journal of prosthodontics and restorative dentistry*. 2002 Jun; 10(2):53-6.
13. El-Sheikh AM, Hobkirk JA, Howell PG, Gilthorpe MS. Passive tactile sensibility in edentulous subjects treated with dental implants: A pilot study. *The Journal of prosthetic dentistry*. 2004 Jan 1; 91(1):26-32.
14. Jacobs R, van Steenberghe D (1994) Role of periodontal ligament receptors in the tactile function of teeth: a review. *J Periodontal Res* 29:153–157.
15. Mantecchini G, Bassi F, Pera P, Preti G (1998) Oral stereognosis in edentulous subjects rehabilitated with complete removable dentures. *J Oral Rehabil* 25:185–189 6.
16. Crum RJ, Loisel RJ (1972) Oral perception and proprioception: a review of the literature and its significance to prosthodontics. *J Prosthet Dent* 28:215–230 7.
17. Van Steenberghe D (1979) The structure and function of periodontal innervations. A review of the literature. *J Periodont Res* 14:185–203 8.
18. Smith PW, McCord JF (2002) Oral stereognostic ability in edentulous and dentate individuals. *Eur J Prosthodont Restor Dent* 10:53–56 9.
19. Hochberg I, Kabcenell J (1967) Oral stereognosis in normal and cleft palate individuals. *Cleft Palate J* 4:47 10.
20. Rossetti PHO, Bonachela WC, Nunes LMO (2004) Oral stereognosis related to the use of complete dentures: a literature Review. *Int J Oral Med Sci* 2:57–60 11.
21. Brill N, Schubeler, Tryde G (1962) Aspects of occlusal sense in natural and artificial teeth. *J Prosthet Dent* 12:123–128 12.
22. Meyer G, Fangha nel J, Proff P (2012) Morphofunctional aspects of dental implants. *Ann Anat* 194:190–194 13.
23. Jacobs R, Bou Serhal C, Van Steenberghe D (1998) Oral stereognosis: a review of literature. *Clin Oral Investig* 2:3–10 14.
24. Garret NR, Kapur KK, Jochen DG (1994) Oral stereognostic ability and masticatory performance in denture wearers. *Int J Prosthodont* 7:567–572
25. Jacobs R, Wu CH, Goossens K, et al. Oral mucosal versus cutaneous sensory testing: a review of the literature. *J Oral Rehabil*. 2002;29:923–950.
26. Jang KS, Kim YS. Comparison of oral sensory function in complete denture and implant-supported prosthesis wearers. *J Oral Rehabil*. 2001; 28: 220–225. 3.

27. Batista M, Bonachela W, Soares J. Progressive recovery of osseoperception as a function of the combination of implant-supported prostheses. *Clin Oral Implants Res.* 2008; 19:565–569.
28. Van Loven K, Jacobs R, Swinnen A, et al. Sensations and trigeminal somatosensory-evoked potentials elicited by electrical stimulation of endosseous oral implants in humans. *Arch Oral Biol.* 2000; 45:1083–1090.
29. Dalaya MV. A study of oral stereognostic proficiency in dentulous and edentulous persons. *J Clin Diagn Res.* 2014; 8:ZE01–ZE06.
30. Balci N, Alkan N, Gurgan CA. Psychometric properties of a Turkish version of the oral health impact profile-14. *Niger J Clin Pract.* 2017; 20:19–24.
31. Fujii R, Takahashi T, Toyomura A, et al. Comparison of cerebral activation involved in oral and manual stereognosis. *J Clin Neurosci.* 2011; 18: 1520–1523.