INFLUENCE OF DIFFERENT TEETH POSITION IN IMMEDIATELY LOADED SINGLE IMPLANT RETAINED COMPLETE MANDIBULAR OVERDENTURE

Osama Abdelhamid Helaly[*], Mohamad Reda El-Kholy[**],
Diab Fattouh El-Haddad[***], Mohamad Abd-Allah Quassem[****]

ABSTRACT

This study was conducted to evaluate the influence of teeth position on patients satisfaction in immediately loaded single implant retained complete mandibular overdenture. Ten completely edentulous patients were selected. For each patient complete maxillary and mandibular conventional complete denture were constructed. Patient were divided into two groups according to position of posterior teeth Goup I : Patients wearing complete denture with posterior teeth arranged at the crest of the ridge. Group II : Patients wearing complete denture with posterior teeth arranged at neutral zone area . For each patient single implant was inserted in the mandible in the midline with ball and socket attachment. Mandibular complete dentures were converted to mandibular overdenture immediately after implant insertion . For each patient a questioner was used for assessment of patient satisfaction. The data were collected and statistically analyzed using spss and one way anova test .The results showed no statistically significant difference between the two groups.

INTRODUCTION

Restoration of completely lost dentition using dentures is a well-known treatment entity since many centuries. With the increased life expectancy, this rehabilitation should have long lasting treatment predictability. Conventional tissue-supported prosthesis requires frequent recall visits due to continued residual ridge resorption.

The use of natural tooth or root-supported over-dentures has promised better prognosis due to enhanced stability and retention, and reduced ridge resorption. However, availability of periodontally sound abutment in strategic positions for successful rehabilitation is always a challenge. However, implant-retained or–supported overdentures have provided better opportunity in rehabilitative procedure with predictable success.

Minimizing the amount of unfavorable torque forces affecting the denture can be achieved by carefully shaping the polished surfaces and appropriate arrangement of the artificial teeth, so that the surrounding musculature tends to stabilize the denture during function. This refers to the neutral zone concept that can be utilized during the construction of complete dentures.

Positioning artificial teeth in the neutral zone achieves two objectives. First, the teeth will not interfere with the normal muscular function and second, the forces exerted by the musculature against the dentures are more favorable for stability

* Assistant Lecturer, Department of Removable Prosthodontic Faculty of Dental Medicine, Boys, Cairo Al-Azhar University
** Professor of Removable Prosthodontic Department .Faculty of Dental Medicine, Boys, Cairo Al-Azhar University
*** Professor and head of Removable Prosthodontic Department .Faculty of Dental Medicine, Boys, Cairo Al-Azhar University
**** Lecturer, Department of Removable Prosthodontics, Faculty of Dental Medicine, Al-Azhar University, Boys, Cairo

and retention which may affect the implant. In this study we will evaluate influence of teeth position on the immediately loaded single implant retained complete mandibular overdenture.

The advantages of neutral zone technique are (1) improved stability and retention; (2) posterior teeth will be correctly positioned allowing sufficient tongue space; (3) reduced food trapping adjacent to the molar teeth; and (4) good esthetics due to facial support.

Besides patients with a severely atrophic ridge, the neutral zone technique for complete denture or removable partial denture (RPD) reconstruction can also be suggested for patients of advancing age and/or long-term edentulism with decreasing facial muscle tonicity, anatomic deformity or insufficiency due to post-cancer oral surgical resections, or those suffering stroke or Parkinson's disease, leading to either atypical movement or an unfavorable denture bearing area. The neutral zone approach to complete denture construction is by no means new but is a valuable one. Unfortunately, it is not a widely practiced procedure. This may be mainly attributed to a lack of knowledge and experience of clinicians to this technique. In addition, the complex procedures not only increase chair time and laboratory cost but also prohibit their clinical use[1]

Patient satisfaction is an important and commonly used indicator for measuring the quality in health care. Patient satisfaction affects clinical outcomes, patient retention, and medical malpractice claims. It affects the timely, efficient, and patient-centered delivery of quality health care. Patient satisfaction is an effective indicator to measure the success of doctors and hospitals[2].

The terms 'patient satisfaction' and 'patient experience' are at times used interchangeably in the literature. The literature reports studies that use both terms, but rarely defines either patient satisfaction or patient experience. Perhaps this is because each term seems to be defined by the factors used to measure it. Patient satisfaction is defined as "element of psychological health that influences the results of medical care"[3]

There are many factors affecting patient satisfaction which can e divided into three main groups: technique related, patient-related, and dentist-related. Technique related factors include those related to the kind of therapy chosen (mainly implant-retained overdentures versus conventional complete dentures), fabrication techniques, influence of impression techniques, occlusal schemes, artificial teeth chewing surface designs, esthetics-related procedures, dentures maintenance and follow-up, number of post-delivery appointments, and denture quality .Patient-related factors include a number of variables, including age, gender, educational level, socioeconomic status, personality and psychological factors,previous denture experience, expectations before denture fabrication, and oral conditions. Dentist-related factors include dentist experience, patients' perception of the dentist and dental care, and communication issues[4].

PATIENTS AND METHODS

Ten completely edentulous patients were selected from the outpatient clinic of removable prosthodontic department, Faculty of Dental Medicine Al Azhar University. Patients fulfilling the following criteria were eligible for inclusion in the study: Men aged between 50 and 65 years , Patient being able to understand and cooperate with the requirements of the study, Angel's class I jaw relation, Patient with normal tongue size and behavior, Patient with adequate interarch space (about 12 mm between the soft tissues and the occlusal plane) , Patient with enough bone for an implant length of 10 mm and a diameter of 3.7 mm, which was assessed clinically and radiographically.

Smokers, drug or alcohol addicts, those with any health condition precluding surgery, physical reasons

that could affect follow-up, or psychiatric problems, and those who had undergone radiotherapy to the head and neck that may affect the implant area were excluded.

Patients participated in the study were divided into two groups:

Group I: patients receive complete denture with posterior teeth arranged at the crest of the ridge.

Group II: patients receive complete denture with posterior teeth arranged at the neutral zone

One screw-type two piece immediately loaded implants with 10 mm length and 3.75 mm diameter from the system were used in this study for each patient with ball and socket attachment were inserted at the symphysis of the mandible. After the healing period the denture was modified to receive the attachment.

Follow up visits were carried out every 6 months for two years after denture insertion to collect data from the patients and regular occlusal adjustment were performed if needed.

For each patient the following questioner used for assessment of patient satisfaction .each question taking score from 1 to 10[5]

How do you rate the appearance of your denture?

How do you rate the quality of expression and phontics?

How do you rate the quality of your mastication?

How do you rate the removal and insertion of your denture?

How comfortable is your denture

Statistical analysis was performed using S-plus statistical software (SPSS-Release 18) for windows. P values less than 0.05 are considered to be statistically significant in all tests.

RESULTS

A-Appearance

The results of appearance, phonetics, mastication, and comfort are listed in table (1). At time of implant insertion, the mean score of patient satisfaction to appearance for group I scored average 6 with SD 0.63 and scored average 6.4 with SD 1.02 for group II (p. value 0.52) which means that there was no significance difference . At 6 months of implant insertion, the mean score of patient satisfaction to appearance for group I scored average 7.2 with SD 0.89 and scored average 7 with SD 1.17 for group II (p. value 0.1). Which means that there was no significance difference. At 12 months of implant insertion, the mean of patint satisfaction to appearance for group I scored average 7 with SD 1.6 and scored average 7 with SD 1.36 for group II (p. value 0.5). Which means that there was no significance difference. At 18 months of implant insertion, the mean of patint satisfaction to appearance for group I scored average 6.4 with SD 1.74 and scored average 6.6 with SD 1.2 for group II (p. value 0.8). Which means that there was no significance difference. At 24 months of implant insertion, the mean of patint satisfaction to appearance for group I scored average 6.2 with SD 0.97 and scored average 6.4 with SD 0.84 for group II (p. value 0.72). Which means that there was no significance difference

B-Phonetics

The results of patient satisfaction with phonetics are listed in table (2) and figure (3) at time of implant insertion, the mean score of patient satisfaction to phonetics for group I scored average 5.8 with SD 0.75 and scored average 6.2 with SD 0.98 for group II (p. value 0.43).Which means that there was no significance difference.

At 6 months of implant insertion, the mean of patient satisfaction to phonetics for group I scored

average 6.2 with SD 1.17 and scored average 6.6 with SD 1.02 for group II (p. value 0.61). Which means that there was no significance difference.

At 12 months of implant insertion, the mean of patient satisfaction to phonetics for group I scored average 8.2 with SD 0.4 and scored average 8.4 with SD 0.49 for group II (p. value 0.54). Which means that there was no significance difference

At 18 months of implant insertion, the mean of patient satisfaction to phonetics for group I scored average 8.6 with SD 0.8 and scored average 9 with SD 0.63 for group II (p. value 0.45). Which means that there was no significance difference

At 24 months of implant insertion, the mean of patient satisfaction to phonetics for group I scored average 8.8 with SD 0.97 and scored average 9.6 with SD 0.48 for group II (p. value 0.18). Which means that there was no significance difference

C-Mastication

At time of implant insertion, the mean score of patient satisfaction to mastication for group I scored average 5 with SD 0.63 and scored average 5.4 with SD 0.49 for group II (p. value 0.77). Which means that there was no significance difference. At 6 months of implant insertion, the mean score of patient satisfaction to mastication for group I scored average 6.2 with SD 0.40 and scored average 6.8 with SD 0.75 for group II p. value 0.19. Which means that there was no significance difference

At 12 months of implant insertion, the mean score of patient satisfaction to mastication for group I scored average 7.2 with SD 1.17 and scored average 7.6 with SD 0.80 for group II p. value 0.58. Which means that there was no significance difference.

At 18 months of implant insertion, the mean score of patient satisfaction to mastication for group I scored average 7.8 with SD 1.32 and scored average 8.4 with SD 1.01 for group II p. value 0.49. Which means that there was no significance difference. At 24 months of implant insertion, the mean score of patient satisfaction to mastication for group I scored average 8 with SD 0.74 and scored average 9 with SD 0.89 for group II (p. value 0.74). Which means that there was no significance difference

D-Comfort

The mean score of patient comfort with denture for group I scored average 5.8 with SD 0.98 and scored average 6.2 with SD 0.75 for group II (p. value 0.53). Which means that there was no significance difference. At 6 months of implant insertion, the mean score of patient comfort with denture for group I scored average 7 with SD 0.89 and scored average 7.4 with SD 0.49 for group II (p. value 0.45). Which means that there was no significance difference. At 12 months of implant insertion, the mean score of patient comfort with denture for group I scored average 7.4 with SD 1.2 and scored average 8.2 with SD 1.17 for group II (p. value 0.36). Which means that there was no significance difference. At 18 months of implant insertion, the mean score of patient comfort with denture for group I scored average 8.6 with SD 0.48 and scored average 8.8 with SD 1.16 for group II (p. value 0.75). Which means that there was no significance difference. At 24 months of implant insertion, the mean score of patient comfort with denture for group I scored average 9.2 with SD 0.74 and scored average 9.6 with SD 0.48 for group II (p. value 0.39) which means that there was no significance difference

TABLE 1: Results of patient satisfaction with appearance

	Time	Group I	Group II	P Value	Sig
Appearance		(Mean ± SD)	(Mean ± SD)		
	Time of insertion	6 ± 0.63	6.4 ± 1.02	0.52	N.S
	6 Months	7.2 ± 0.89	7 ±1.17	0.1	N.S
	12 Months	7 ± 1.6	7 ± 1.36	0.5	N.S
	18 Months	6.4 ± 1.74	6.6 ± 1.2	0.8	N.S
	24 Months	6.2 ± 0.97	6.4 ± 0.84	0.72	N.S
Phonetics	Time of insertion	5.8 ± 0.75	6.2 ± 0.98	0.43	N.S
	6 Months	6.2 ± 1.17	6.6 ± 1.02	0.61	N.S
	12 Months	8.2 ± 0.4	8.4 ± 0.49	0.54	N.S
	18 Months	8.6 ± 0.8	9 ± 0.63	0.45	N.S
	24 Months	8.8 ± 0.97	9.6 ± 0.48	0.18	N.S
Mastication	Insertion	5 ± 0.63	5.4 ± 0.49	0.77	N.S
	6 month	6.2 ± 0.40	6.8 ± 0.75	0.19	N.S
	12 month	7.2 ± 1.17	7.6 ± 0.80	0.58	N.S
	18 month	7.8 ± 1.32	8.4 ± 1.01	0.49	N.S
	24 month	8 ± 0.74	9 ± 0.89	0.74	N.S
Comfort	Insertion	5.8 ± 0.98	6.2 ± 0.75	0.53	N.S
	6 month	7 ± 0.89	7.4 ± 0.49	0.45	N.S
	12 month	7.4 ± 1.2	8.2 ± 1.17	0.36	N.S
	18 month	8.6 ± 0.48	8.8 ± 1.16	0.75	N.S
	24 month	9.2 ±0.74	9.6 ± 0.48	0.39	N.S

DISCUSSION

The patients were selected free from any metabolic disease as diabetes or any terminal disease which may influence the healing or potential infection of the implant recipient site and lack of osseo-integration.

Patients suffering from temporomandibular joint disorders were excluded as these problems influence the masticatory muscle activity. Age of the patients was ranged from 55 to 60 years for fast adaptation to the new denture .Screw design of implant was used due to its resistance to shear stresses which are a pre-request for successful osseointegration.

The aim of the neutral zone is to construct a denture in muscle balance, as muscular control will be the main stabilizing and retentive factor during function. The technique is relatively simple but there are increased chair time and laboratory costs[6].

The results of this study showed higher values of patient satisfaction with the neutral zone group with no statistical significant difference with the crest of the ridge group. This may be explained

that the position of teeth in the neutral zone causes less interference with the surrounding musculature than the crest of the ridge group during function and speech. Another possible explanation that satisfaction levels of denture are primarily related to denture retention, which is nearly equal in both groups.

The results indicates that single implant overdenture is a successful treatment modality regardless of the position of teeth according to the parameters of success or failure in this study

CONCLUSION

The tooth positioning at the neutral zone has better clinical effect on immediately loaded mandibular single implant overdenture than that on the ridge crest but there is a non-significant difference between the two groups .

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