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# Clinical Assessment of Overdenture Retention - A Longitudinal Study

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**KEYWORDS**

Overdentures, Dental implants, Masticatory efficiency, speech, comfort

**ABSTRACT:**

**PURPOSE-** The continuous resorption of the alveolar ridge after extraction of all the teeth can eventually result in a jaw anatomy which offers inadequate support for the dentures. The purpose of the study was to evaluate masticatory efficiency, speech and over all comfort in implant supported over denture patients.

**MATERIAL AND METHOD –**A study was conducted at Rajarajeswari dental college & Hospital on 16 complete denture-wearing patients. They were converted into 2 implants supported overdentures. The implants were one piece with integrated ball attachment for retention. A healing time of 2–3 months was given before loading. During the follow-up period these patients were asked to grade the overdenture as poor, satisfactory, good and excellent separately in the categories of masticatory efficiency, speech, retention and overall comfort

**RESULTS –** Implant failure was seen in 1 case during the healing phase. A success rate of 93.8% was seen in this study during an observation period of 6 months.

**CONCLUSIONS -**Majority of the cases had good masticatory efficiency, overall comfort and speech. Implant retained overdentures help in improving the masticatory efficiency, speech and overall comfort of the patient as compared to conventional dentures

## 1. Introduction

Over dentures are defined as a prosthesis that covers and is partially supported by natural teeth, tooth roots and dental implants. The continuous resorption of the alveolar ridge after extraction of all the teeth can result in inadequate support for the dentures. [1] This resorption can render the prosthesis inadequate in terms of both function and aesthetics. The bone loss that occurs during the 1st year after tooth loss is 10 times greater than in following years. Also, annual bone resorption is more pronounced in patients who wear conventional complete dentures than implant overdentures. [2] Placement of implants prevents this bone loss and results in better chewing efficiency. The traditional dentures cause more bone resorption leading to loss in retention and stability of prosthesis. [3] Many patients are not satisfied with the clinical effects of conventional complete dentures, due to problems in eating and speaking, poor retention and stability. Currently osseointegrated implants seem to have become a more reliable form of treatment for these patients. Implant overdentures offer the advantages of improved comfort, support, retention, and stability. [4]

OBJECTIVES

The aim of this study was to evaluate the masticatory efficiency, speech and overall comfort of Implant supported Overdentures.

MATERIALS AND METHODS

A study was conducted at Rajarajeswari dental college & Hospital on 16 complete denture-wearing patients. Old denture wearers for more than 2 years who were comfortable with upper denture and had history of loose lower denture were selected to the study.

The pre-operative evaluation of the patient was done. OPG, CBCT scan, routine haematological examination was done. Patients with uncontrolled diabetes were not selected for the procedure. A written consent was obtained from the patients.

Implants position was planned with radiographic markers placed in the existing denture and CBCT was done

Under local anaesthesia, creatal incision was placed, full thickness mucoperiosteal flap was raised. Two implants were placed 3.3mm in diameter, 11.5 mm in length in 10 patients and 3.3*13 mm in 6 patients, a total of 32

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implants were placed. Implants were single piece integrated with ball attachment from Equinox, Myraid company. The flaps were well approximated taking care to preserve after one week the keratinised mucosa around the implants.

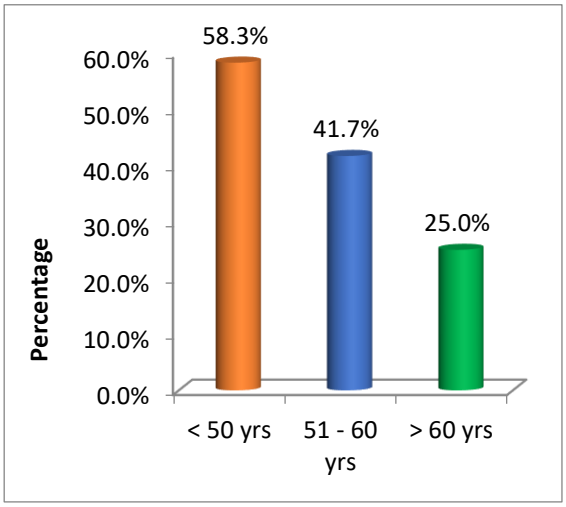
A healing period of 2–3 months was followed before loading. The post-operative orthopantamogram was taken to confirm healing. The new dentures were fabricated and in all cases. The chair side pick-up of mandibular denture was done. The first follow up was after one week to check the occlusion, any pressure spots, comfort of placing the lower denture was assessed. Instructions about oral hygiene measures were given. The next appointment was scheduled at one month, two months, 3 months and six months, where retention of denture, occlusion was examined in all the cases. During the follow-up period, after six months of using implant supported dentures these patients were asked to grade the overdenture as poor, satisfactory, good and excellent separately in the categories of masticatory efficiency, speech, retention and overall comfort.

RESULTS

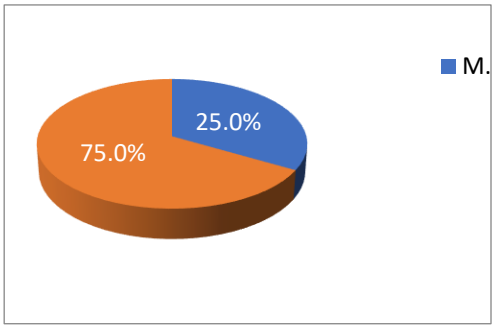
A total 16 complete denture-wearing patients participated in the study. There were 9 male and 6 female patients in the of age group between 37-76years. A total of 32 implants were placed. During the follow-up period after six months these patients were asked to grade the overdenture as poor, satisfactory, good and excellent separately in the categories of masticatory efficiency, speech and overall comfort (Table 3).

Majority of the patients graded the treatment as good and excellent.

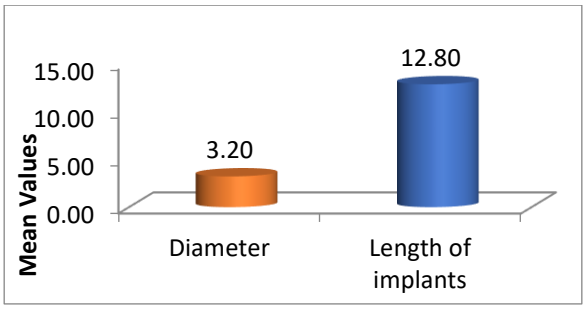
All the implants were stable after loading and one Implant out of 32 implants placed failed. The implant failed three months after loading due to Periimplantitis. The success rate was 93.8% in this study during an observation period of 6 months.




**GRAPH 1: Age wise distribution of study subjects**




**GRAPH 2: Genderwise distribution of study subjects**




**GRAPH 3: Descriptives of the implant size characteristics among study subjects**

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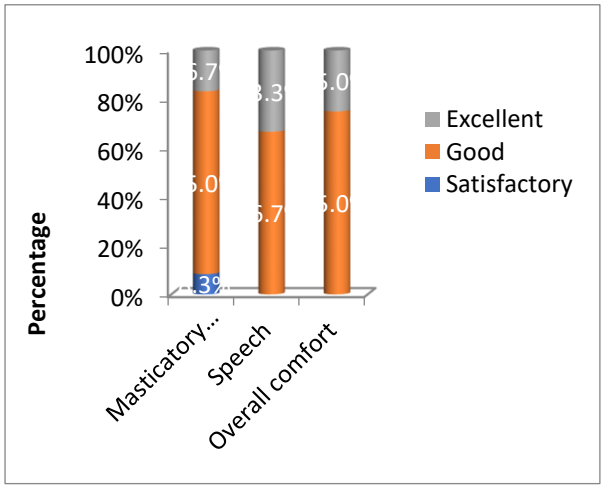


**Description of the over- all feedback on over-dentures by study subjects**

Case pictures

Fig 1 : pre-operative OPG

Fig 2: implants in-situ

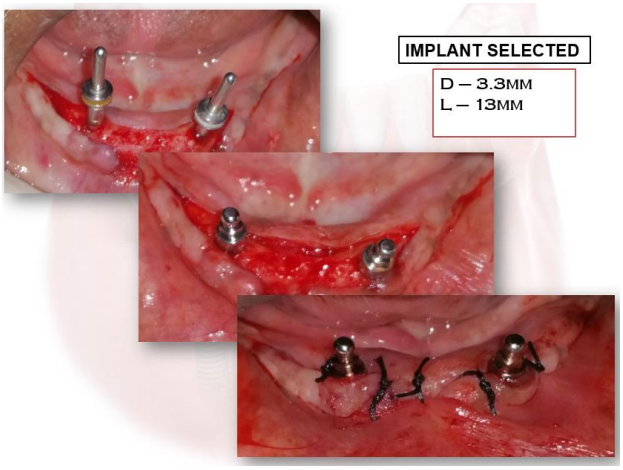


Fig 3: Post operative OPG

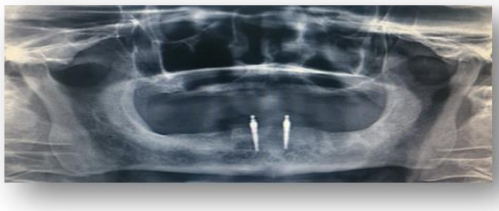

Fig 4: IMPLANT INSITU IMPRESSION AND COPINGS ATTACHED

**Fig 5: CAST FABRICATION WITH IMPLANT ANALOGS FOR MANDIBULAR OVERDENTURE**

**Fig 6: IMPRESSION PROCEDURE; PICKUP IMPRESSION WITH**

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**IMPRESSION COPINGS IN CUSTOM TRAY**

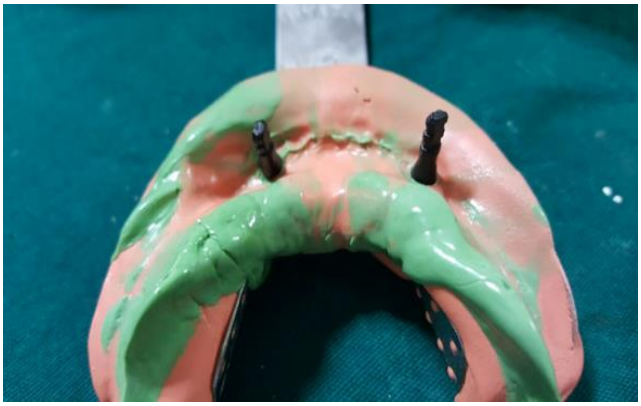

**Fig 7 : MANDIBULAR IMPLANT-RETAINED OVERDENTURE WITH BALL ATTACHMENTS AND THE CORRESPONDING OVERDENTURE WITH ATTACHMENT HOUSINGS**

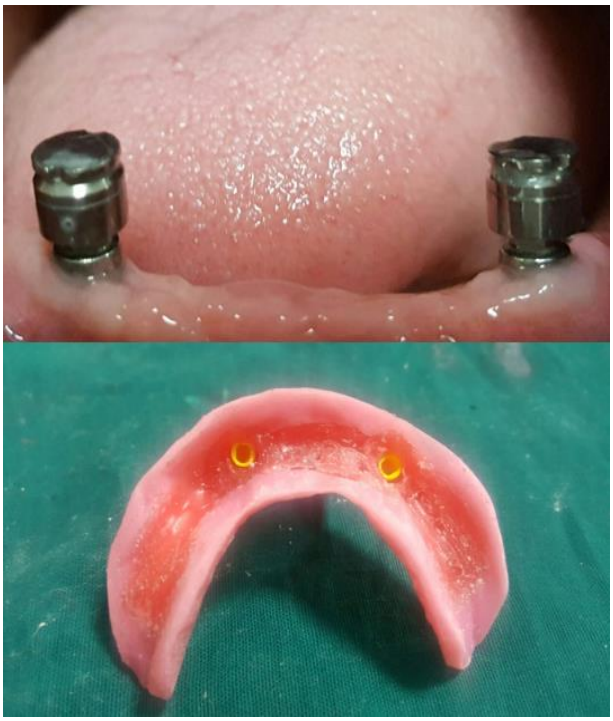

**Fig 8: Post- rehabilitation**

STATISTICAL ANALYSIS

Statistical Package for Social Sciences (SPSS) for Windows, Version 22.0. IBM Corp: Armonk, NY, USA was used to perform statistical analyses.

DISCUSSION

The edentulous patients main concern is function and aesthetics. The issues with complete denture in profound alveolar ridge resorption are lack of retention of dentures, chronic soreness in the residual alveolar mucosa, reduced masticatory efficiency. This affects the psychological status of the patient. Implant supported over denture provides a distinct advantage over a conventional complete denture. [5] Complete denture depends on the under lying residual alveolar ridge and mucosa for support and retention. In implant supported over denture the support is derived from implants in the anterior region and from the buccal shelf areas bilaterally. The 2002 Mc Gill consensus statement reports quality of life is better in patients wearing implant supported over denture when compared to complete denture. [6] It was concluded that restoration of edentulous mandible with a conventional denture is no longer the best choice and implant supported over denture is considered as the standard of care.

In implant supported over denture, stability is from the mechanical attachment between the implants and the denture. The implants hold the denture in the determined centric occlusion and limits lateral movements there by enhances stability. Perioral musculature and tongue don't lift the implant supported denture there by provides good

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retention. [7] The inter arch space as it increases above 18mm, implant supported over denture becomes the treatment of choice over fixed prosthesis. The implant supported over denture flanges provides support for the lips and soft tissues of the face, restoring the facial contour.

The other advantage of implant supported over denture is the extension of the flange can be reduced to the level of mylohyoid line there by providing more space for the tongue [7]

The implants are placed in the inter-foraminal region, which has predictably good quality of bone. The implants integrate with bone and maintains the bone height. Schwartz -Arad et al observed less than 0.2mm bone loss in 70% of implant supported over denture. [8] Misch found only 0.6mm of bone loss over a period of five years and long term resorption as low as 0.1mm per year. [9]

A study done by Mericske-Stern R stated that overdentures supported by implants have a higher probability of success than overdentures supported by the roots of natural teeth. [10]

The various studies have shown success rate of 95.4% for implant supported over denture with slightly higher success rate in mandible compared to implant supported over denture placed in maxilla. [8] A success rate of 93.8% was seen during an observation period of 6 months in this study.

The ball and socket attachments were used in the study. It allows multidirectional movement of the prosthesis, acting as a shock absorber there by reducing the load on the abutment. Ismail HA,Mahrous AI,Bansr FH,SolimanTA,Baraka Y, Two year retrospective evaluation of over dentureretained by symphyseal single implant using two types of attachments J Int Oral health 2015;7(6):4-8 . Implant's superstructure and attachments and the over-denture must be checked and clinically should be maintained on a regular basis. Attachments often need periodic adjustment or replacement due to wear. An implant-supported denture should be removed daily to clean. Since it can be removed oral hygiene maintenance is easier

In agreement with the findings of numerous studies, the masticatory efficiency of all 16 patients increased significantly after placing overdenture. In addition to the improvement in Masticatory efficiency, speech, retention and overall comfort was good in all the study samples.

The main requirement of denture is it should be retentive, which will enhance the other features like mastication, speech and provides psychological comfort to the patient. Fourteen patients had good retention of the dentures, two patients had poor retention, which required replacement of the retentive housing.

The implant supported denture is economically affordable to the geriatric patients and in all the cases denture was pick up was done at the chair side. This drastically reduced the laboratory cost. Implant retained over denture using two implants is relatively simple protocol with reduced surgical and laboratory procedure. Implant supported overdentures definitely improved the masticatory efficiency, retention, speech and over all comfort.

The limitations of the study are short follow up period of six months, as it was aimed at assessing the masticatory efficiency, speech and overall comfort in patients who had an experience with complete dentures. Prospective randomised studies with larger sample, long follow up with additional parameters will provide sufficient evidence for routinely practising implant supported over dentures.

## CONCLUSION

Implants supported over dentures helps in improving the masticatory efficiency, speech and comfort. This can be considered as the first choice in the standard care of edentulous patients. Two implant supported over denture is economically affordable.

## References

1. Col M.C. Sharma (Retd), Maj Gen Vimal Arora. Clinical evaluation of overdenture retention using indigenous dental implants. Medical journal armed forces India. 2014;70:264 – 269
2. Jacobs R, van Steenberghe D , Nys M , Naert I. Maxillary bone resorption in patients with mandibular implant-supported overdentures or fixed prostheses. J Prosthet Dent. 1993 Aug;70(2):135-40.
3. Tallgren A. The continuing reduction of the residual alveolar ridges in complete denture wearers: A mixed-longitudinal study covering 25 years. J Prosthet Dent 1972;27:120-32.
4. M.C. Sharma, Vimal Arora. Clinical evaluation of overdenture retention using indigenous dental

implants. Med J Armed Forces India. 2014 Jul; 70(3): 264–269.
5. Mericske-Stern R. Clinical evaluation of overdenture restorations supported by osseointegrated titanium implants: a retrospective study. Int J Oral Maxillofac Implants. 1990;5:375e383.
6. Feine JS, Carlsson GE, Awad MA, Chehade A, Duncan WJ, Gizani S, et al. The McGill consensus statement on overdentures. Mandibular two-implant overdentures as first choice standard of care for edentulous patients. Gerodontology. 2002 Jul;19(1):3-4.
7. Esa Klemetti, Antoine Chehade, Yoshiaki Takanashi, Jocelyne S. Feine. Two-Implant Mandibular Overdentures: Simple to Fabricate and Easy to Wear. J Can Dent Assoc 2003; 69(1):29–33.
8. Schwartz-Arad D, Kidron N, Dolev E. A long-term study of implants supporting overdentures as a model for implant success. J Periodontol. 2005 Sep;76(9):1431-5.
9. Misch CE. Contemporary Implant Dentistry. 2nd ed. Mosby: St.Louis (MO); 1999:179.
10. Mericske-Stern R. Overdentures with roots or implants for elderly patients: a comparison. J Prosthet Dent. 1994 Nov;72(5):543-50.