Case Report

JRAD Journal of Research and Advancement in Dentistry

J Res Adv Dent 2016;5:3s:141-146.

Tooth Supported Overdenture Reinforced with Stainless Steel Meshwork: A Case Report

Tushyata Chandhok[1*] Ajay Gupta[2] Gagan Khanna[3] Rohit Mittal[4] Surbhi Gupta[5] Satvik Singh[6]

[1]PG Student, Department of Prosthodontics and Crown and Bridge, DJ College of Dental Sciences and Research, Modinagar, UP, India.
[2]Professor and Head, Department of Prosthodontics and Crown and Bridge, DJ College of Dental Sciences and Research, Modinagar, UP, India.
[3]Reader, Department of Prosthodontics and Crown and Bridge, DJ College of Dental Sciences and Research, Modinagar, UP, India.
[4]Senior Lecturer, Department of Prosthodontics and Crown and Bridge, DJ College of Dental Sciences and Research, Modinagar, UP, India.
[5]PG Student, Department of Prosthodontics and Crown and Bridge, DJ College of Dental Sciences and Research, Modinagar, UP, India.
[6]PG Student, Department of Prosthodontics and Crown and Bridge, DJ College of Dental Sciences and Research, Modinagar, UP, India.

ABSTRACT

Background: Overdenture is a complete or removable partial denture that covers and rests on one or more remaining natural teeth, the root of natural teeth, or dental implants. Overdentures offer many advantages over conventional complete dentures. The most important benefits are preservation of the remaining alveolar supporting bone along with increased stability and retention of the prosthesis. Greater support and stability of prosthesis is associated with improved bite force and oral function for overdentures when compared to conventional complete dentures. Retaining natural teeth under an overdenture preserve sensory input from the periodontal receptors which are more precise than that obtained from oral mucosa. Tooth supported overdenture has the additional advantage of being less expensive but has a high incidence of fracture of the acrylic resin base at the point of the retained natural teeth. Incorporation of a metal reinforcing mesh, or wires have been recommended to improve resistance to denture fracture during function. Thus, tooth supported overdentures are more beneficial as they provide psychological, functional as well as biological advantages for the patients.

Keywords: Overdentures, meshwork reinforced denture, tooth supported overdenture, retention.

INTRODUCTION

The mastication, phonation and esthetics: The trident factors are very important and should be given due consideration when any dental procedure is initiated to achieve the successful outcome of treatment. The prosthetic management of edentulous patient has long been a major challenge for dentistry. For well over a century, complete maxillary and mandibular denture have been the traditional standard of care. However, most of the patients report significantly more problems adapting to their mandibular denture due to a lack of comfort (e.g., they suffer from an increase in pain and soreness), retention, stability and inability to chew and eat. Recent scientific studies carried out over the past decade have determined that the benefits of a mandibular two implant over denture/coping retained are sufficient to propose the two implant over denture - rather than conventional denture - as the first treatment option. This in the prosthodontics literature has led to shift in therapeutic philosophy regarding restoration of the edentulous patient.[1] Overdenture has been a proven mainstay of conservative prosthodontic treatment when proper diagnosis, treatment planning, and most importantly, patient compliance are achieved. Despite recent

Received: Oct. 5, 2016: **Accepted:** Nov. 23, 2016
***Correspondence Dr. Tushyata Chandhok.**
Department of Prosthodontics and Crown and Bridge, DJ College of Dental Sciences and Research, Modinagar, UP, India.
Email: tushyatachandhok@gmail.com

pISSN 2278-0076
eISSN 2321-9270

developments in dental implantology, the conservative approach to root preservation followed by an overdenture is still valid. The many advantages of root retention include- alveolar bone maintenance, better prosthesis support, proprioceptive feedback, aesthetics and psychological benefits.[2]

Advantages of conventional over denture:

- Feels more like having teeth
- More retention in many cases
- Helps to reduce shrinkage of surrounding alveolar bone
- Reduces pressure on portions of the alveolar ridge
- Positive psychological advantage of still having teeth.

Disadvantages of conventional over denture:

- Scrupulous oral hygiene is essential in order to prevent decay and periodontal disease
- The over denture may appear bulkier than conventional denture
- Frequent maintenance examinations are necessary
- In general, this is a more expensive approach than conventional denture.

CASE REPORT

A 65 year female patient had reported to the Department of Prosthodontics & Implantology with the chief complaint of inability to chew food properly due to multiple missing teeth. There was no relevant medical history affecting prosthodontic treatment. Extraoral examination showed no abnormality. Intraoral examination revealed partially edentulous maxillary and mandibular arches.

The different treatment options available for this patient were:-

1. Extraction of remaining teeth followed by conventional complete denture.
2. Cast partial denture.
3. Extraction followed by implant supported overdenture.
4. Tooth supported overdenture.

Depending on the existing condition of the remaining dentition and financial status of the patient, it was decided to use the remaining teeth as abutments and fabricate a tooth supported overdenture owing to the obvious advantages of the retention of the roots. The location of the remaining teeth was favorable for an overdenture. The patient was motivated to retain the remaining teeth. The remaining teeth were endodontically treated. The abutment teeth were reduced in vertical height to 2mm above the crest of the ridge. The preparation was rounded to minimize the horizontal torque on the roots. The tooth preparation was done to receive copings.

Impressions of maxillary and mandibular arches were recorded using irreversible hydrocolloid impression material to obtain a cast. Wax pattern was made over the prepared teeth. Metal copings were obtained by casting and cemented over the prepared teeth.

Final impression, with coping in place on their respective abutment was made using a custom tray prepared by autopolymerising resin. was carried out using green stick compound (Fig 1).

Fig 1: Border Moulding using a custom tray.

After completing border moulding, final impression was recorded (Fig.2). The jaw relation was recorded and teeth arrangement was done followed by try-in.

Fig 2: Final Impression.

Maxillary and mandibular complete dentures were fabricated following the conventional method except that the is embedded after dewaxing stage at the time of packing to improve resistance to denture fracture during function (Fig. 3).

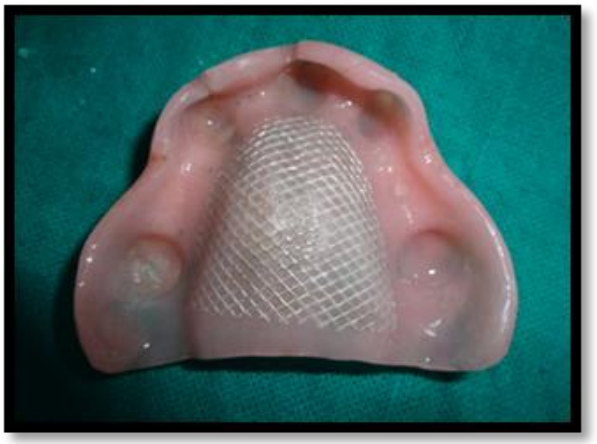

Fig 3: Metal mesh in maxillary denture and wire in mandibular denture is embedded at the time of packing.

The dentures were finished, polished and inserted into the patient mouth (Fig 4).

Fig 4: Finished and Polished Maxillary and Mandibular Denture.

The patient was given instruction about insertion and removal as well as maintenance of the dentures. The post operative appearance is shown in (Fig. 5).

Fig 5: Post operative frontal and lateral view.

Periodic follow-up was carried out. Initially, the patient returns to the dental clinic every week during the first month. Then he returned once a month for the next 5 months. The patient showed satisfaction with the final result of his treatment, and no complications were observed during this period.

DISCUSSION

Fabrication of tooth supported over denture is a step in the direction of preventive prosthodontics[3]. The residual ridge reduction coupled with reduced dexterity at advanced age impairs the adaptation to denture prosthesis. The obvious way to prevent denture problems is to save the natural teeth.[4] Healthy teeth with compromised periodontal status can be modified and retained for biomechanical and psychological advantages. This preventive approach can be achieved by means of overdentures.[5]

The most important benefits are the preservation of the remaining alveolar supporting bone and increased stability and retention of the denture[6]. Overdentures require particularly careful assessment of vertical space. There must be sufficient room for roots and copings, together with an adequate thickness of denture base material and artificial teeth, without jeopardizing the strength of the denture[7]. In such cases, improvement is accomplished by utilization of roots to support, stabilize and retain the overdenture. The short coping design showed least amount of stress than any of the other design like tapered coping design & tapered coping with occlusal bearing design. This design minimizes horizontal torque on the roots[8] and provides ease of maintenance of oral hygiene. These alternatives offer the patient a more comfortable prosthesis, especially in the mandibular arch rehabilitation where achievement of functional requirements of the complete dentures with respect to retention, support and stability are limited[9].

Two most significant factors for the success of the overdenture are proper selection of the patient and establishing careful mode of treatment that will satisfy both the patient and the dentist.[10] According to Zarb et al the advantages of overdentures include retention and stability especially the mandibular dentures[11]. The maxillary overdenture is of great value when it opposes remaining mandibular anterior teeth, because it aids in conserving the ridge against resorption from masticatory stress.[3]

The main objective in using tooth-supported overdenture is to preserve the remaining supporting tissue and to restore missing structures in such a way as to provide maximum service for maximum amount of time. A major premise of tooth supported overdenture treatment is to transfer occlusal forces along the long axis of the supporting tooth, to minimise the horizontal torque and to allow for a more optimum situation for periodontal ligaments.[12] According to Robert L Defranco tooth supported overdenture three important goals. It

maintains the abutment as a part of the residual ridge which in turn provides more support than a conventional complete denture. When the teeth are retained,alveolar bone integrity is maintained as they support the alveolar bone. However when teeth are removed alveolar bone resorption process begins. With the preservation of the teeth there is also preservation of the periodontal membrane and this in turn preserves propioceptive impulses resulting in better occlusal awareness, biting forces and consequent neuromuscular control.[11] In routine clinical practice, overdenture should also be considered as a treatment modality for a patient who has few teeth left in the oral cavity. Thus it can be said that the application of overdentures is unlimited and its success depends on the dentist judgement and skill and patient motivation to maintain good oral hygiene.

Finally, one of the most important requirements to the success of overdentures is the patient's awareness of their need to improve oral hygiene of the remaining roots used for support and/or retention. The patient must be instructed to correct techniques of oral hygiene to improve considerably the longevity of the oral rehabilitation as long as possible.[9]

CONCLUSION

Prosthodontic rehabilitation of cases like partial anodontia not only improves function and esthetics dramatically, but also psychologically boosts the morale of the patients more so when the individual is of younger age. The over denture has innumerable advantages and applications compared with conventional complete denture such as root retention, better prosthesis support, proprioceptive feedback, esthetics and psychological benefits. The success depends upon proper case selection with critical monitoring of various steps involved. In this study use of root abutment as an aid to support complete denture is presented. Even though the retained teeth may be periodontally compromised, they still may provide sufficient support for the transmission of masticatory pressure, periodontal ligament receptors to initiate a jaw opening reflex, enhance support and stability of the denture and slow the rate of alveolar resorption. It is necessary to have patient awareness about good oral hygiene to maintain the roots so that treatment remains satisfactory for a long time.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Prakash VS, Shivaprakash G, Hegde S, Nagarajappa Four and two tooth supported - Conventional over denture: Two case reports. Int J of Oral Health Sci,2013;3(1):61-64.
2. Verma PR, Rawat M, Kinra MS, Kaur J, Kapoor H Tooth Supported Overdenture – A Case Report. Journal of Dental Herald ,2014;1(4):30-32.
3. Wayne R. Frantz:The use of natural teeth in overlay dentures, JPD. 34: 135-140,1975.
4. Pound E. Cross-arch splinting versus premature extraction, JPD 1966; 16: 1058-68.
5. Crum RJ, Rooney GE Jr: alveolar bone loss in overdentures: a 5-year study. JPD 1978;40;610-13.
6. Morrow RM. Handbook of immediate overdentures. St. Louis: Mosby;1978:48.
7. Eugen J. Dolder, Dr.Med. Dent The bar joint mandibular denture. J Prosthet Dent 1961;11:689-707.
8. A.B Warren, A.ACaputo. Load transfer to alveolar bone as influenced by abutment design for toot-supported dentures. JPD 1975;33;137-148.
9. Brkovic-Popovic S, Stanisic-Sinobad D, Postic SD, Djukanovic D. Radiographic changes in alveolar bone height on overdenture abutments: a longitudinal study. *Gerodontology*. 2008; **25**: 118-223.
10. Toolson LB, Smith DE. A five year longitudinal study of patients treated with overdentures. JPD 1983;49;149-156.

11. Dixit S, Acharya S. Benefits of overdentures. Journal of Nepal dental association 2010;11:97-100.

12. A.B Warren, A.ACaputo. Load transfer to alveolar bone as influenced by abutment design for toot-supported dentures. JPD 1975;33;137-148.