

Overdenture: A Boom For Tooth Supported Prosthesis

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Abstract

The goal of maintenance of roots of one or more teeth for overdenture are to prevent alveolar bone resorption, provide better load transmission, maintain sensory feedback and achieve better stability of denture with emphasis on psychological aspect of not being completely edentulous. The purpose of this case discussion was to evaluate the usefulness of utilizing abutment teeth in the support of complete dentures.

Key words: Over denture, Overlay denture.

Introduction

Dentures & Implants are not a replacement for teeth; they are a replacement for no teeth. An overdenture enables utilization of the advances in periodontal and endodontic therapy in conjunction with a greatly reduced crown to root ratio to give a viable alternative to treatment. Even hypermobile teeth following periodontal therapy have been shown to make excellent abutments for an overdenture. The goals of over denture are as, for maintaining teeth as a part of residual ridge, for decreasing rate of resorption and preservation of neuromuscular perceptions.¹

Over dentures are the dentures which derive their support from one or more abutment teeth by completely enveloping them beneath the fitting surface. A tooth supported over denture is a dental prosthesis that replaces the lost or missing natural dentition and associated structures of maxillae and / or mandible and receives partial support from one or more modified natural teeth.²

Various terms have been used to describe this treatment modality: overlay denture, telescoped dentures, tooth supported dentures, hybrid prosthesis, crown and sleeve prosthesis, and the superimposing dentures.³

Over dentures help to partly overcome many of the problems posed by conventional complete dentures like progressive bone loss, poor stability and retention, loss of periodontal proprioception, low masticatory efficiency, etc.⁴

Case Study

A 44 year old male patient reported to the Department of Prosthodontics, with the chief complaint of difficulty in chewing due to missing teeth causing inability to masticate food and difficulty in speech(Figure-1). He wanted replacement of his missing teeth so that the function can be restored. On intra oral examination, teeth present in maxillary arch were 14, 15, 24, 25 (Fig. 2). The edentulous span had favorable ridge with firmly attached keratinized mucosa. Further determination of the vertical dimension of occlusion (VDO) was achieved using phonetics, swallowing, and patient facial appearance. It was determined that there was loss of VDO. Temporomandibular joint was normal.

Diagnostic impressions were made using irreversible hydrocolloid impression materials and poured in dental stone. Then Diagnostic cast were articulated in semi adjustable articulator using centric relation record and a face-bow transfer to evaluate inter arch space. During the following visit, treatment options were discussed with the patient, including crown lengthening, endodontic therapy and fixed restoration in maxillary premolars followed by

overdenture prosthesis. After considering invasiveness, amount of time and socioeconomic status the patient elected to have, post & core and cast telescopic overlay denture in maxillary arch.

After taking consent, the patient was sent for oral prophylaxis, hygiene instruction and maintenance. 14,15,24,25 were then endodontically treated. New Diagnostic mounting was done using bite rim for establishing vertical dimension (VD) in patient's mouth. Diagnostic teeth arrangements were made to established VD.⁵

After completion of endodontic therapy of 14,15,24,25, abutments preparation for cast metal restoration were done(Fig. 3). Impression were made of both arches, Cast was mounted on the surveyor and wax pattern for primary coping for maxillary premolars were fabricated keeping mind that they are parallel to each other. Wax pattern were invested, casted in chrome cobalt alloy, finished and modified on the surveyor for parallelism, castings were polished and evaluated intraorally for fit, retention and stability and finally cemented in patient mouth (figure 4,5).

Custom tray was fabricated, under cuts were blocked out and definitive impressions were made using monophasic addition silicone impression material then refractory casts were prepared. Maxillo-mandibular relationships were made with frame works in position, and definitive casts were mounted on the semi-adjustable articulator. Shade selection was done, and acrylic resin teeth were arranged in the edentulous regions. Try in was done in patient's mouth and then processed in heat cure acrylic resin. Denture was finished,



polished [Figure-6] and inserted [Figure-7]. Occlusion was evaluated and adjusted, Postoperative instructions was given as how to insert the prostheses and instructions on adequate oral hygiene maintenance as remove the dentures each night and brush the dentures after each meal with a soft toothbrush. After minor adjustments during post insertion visits, the patient was recalled after 6 month.

Discussion

After the loss of the teeth the residual alveolar ridge undergoes rapid loss in all dimensions. The phenomenon of residual ridge resorption (RRR) following removal of teeth have been well observed and documented in literature.^{6,7} While the bone loss following the removal of teeth is stated to be rapid, progressive, irreversible and inevitable, it is equally well observed that bone is maintained around standing teeth and implants.^{7,8} Over denture therapy constitutes essentially a preventive prosthodontics concept as it endeavors to preserve the few remaining teeth and the

supporting structures.^{2,9}

The teeth which are too weak to support a fixed partial denture and are considered unsuitable to support a removable partial denture can often at times be usefully conserved and suitably modified to act as abutments under over dentures for useful span of time. As the over denture status of the prosthesis and its benefits to the patient depends on the continued retention of the underlying abutments, it becomes obligatory to periodically monitor their health and also be instructed to keep the prosthesis clean, to brush it daily as well as his retained teeth. The overdenture should also be left out of the mouth in a cleaning solution overnight.

Conclusion

Although the over denture is not a panacea, if fabricated well with good clinical and laboratory expertise and maintained with care, then each over denture treatment can be a successful one as preserving the teeth and making the denture, tooth and tissue borne, helps in

preserving the supporting structures, both in health and function.

References

1. Winkler S. Overdentures. Essentials of complete denture prosthodontics. 2009;2: 384-402.
2. Glossary of Prosthodontic terms. J Prosthet Dent 2005; 94:10-92.
3. Dhir R.C: Clinical assessment of the Overdentures therapy. J Indian Prosthodont Soc 2009 ;5:187-192.
4. Reitz PV, Weiner MG, Levin B. An overdenture survey: Preliminary report. J Prosthet Dent 1977;37:24658.
5. Chen MS, Eichhold WA, Welker WA, Chien CC. Simplicity in interim toothsupported removable partial denture construction. J Prosthet Dent 1985;54:740-4.
6. Toolson LB, Smith DE. A two year longitudinal study of overdenture patients, Part 1: Incidence and control of caries on overdenture abutments. J Prosthet Dent 1978;40: 486-91.
7. Tallgren A. Positional changes of complete dentures A seven year longitudinal study. Acta Odontol. Scand. 1969;27:539-61.
8. 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.
9. John J. Sharry: Complete Denture Prosthodontics. Third edition, New York, McGraw-Hill Book Co., 1974.

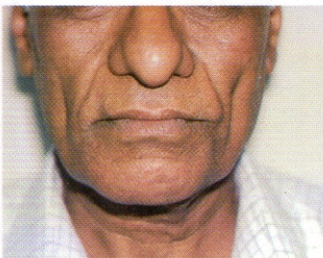


Fig. 1 : Pre operative view



Fig. 2 : Intra oral view



Fig. 3 : Abutments preparation



Fig. 4 : Master cast



Fig. 5 : Finished coping after insertion



Fig. 6 : Over denture prosthesis

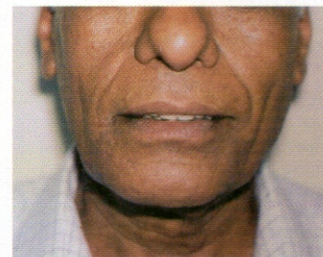


Fig. 7 : Post operative view after insertion

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1316403559957618913723967297167119746813177600, 263280711991523782744793459433423493662635200, 526561423983047565489586918866846987325270400, 105312284796609513097917383773369397460544800, 210624569593219026195834767546738794920889600, 421249139186438052391669535093477589841779200, 842498278372876104783339070186955179683558400, 1684996576745752209566678140373910359367116800, 3369993153491504419133356280747820718634236800, 6739986306983008838266712561495641372668473600, 13479972613966017676533425122991282745336972800, 2695994522793203535306685024598256548667395200, 539198904558640707061337004919651307334790400, 1078397809117281414122674009839022614666980800, 21567956182345628282453480196780532333377600, 43135912364691256564906960393560864666755200, 8627182472938251312981392078712173333510400, 17254364945876502625962784157423466667020800, 34508729891753005251925568314846933334041600, 6901745978350601050385113662969386668083200, 13803491956701202100770227325938773336166400, 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