

TOOTH SUPPORTED OVERDENTURES: A CASE REPORT

Prathyush Reddy, Devi Parameswari.B , Annapoorni Hariharan, Shruti Pillai

Department of Prosthodontics, Faculty of Dentistry
Meenakshi Academy of Higher Education and Research, Alapakkam main road,
Maduravoyal, Chennai, Tamilnadu.

To access & Cite this article

Website: www.jidam.idamadrass.com



Address for Correspondence:

Dr. B. Devi Parameswari, MDS,
Department of Prosthodontics,
Meenakshi Ammal Dental College,
Alapakkam main road, Maduravoyal,
Chennai, Tamilnadu.
E-mail: drdeviparameswari@gmail.com

ABSTRACT

Loss of dentition and remaining supporting periodontal structures causes remodeling of alveolar ridges resulting in a less ideal supporting foundation for complete dentures. Thus the placement of complete dentures can cause functional and para-functional occlusal forces that can resorb the underlying bone. Resorption can be reduced by retaining the remaining natural teeth which can further enhance the retention and stability of the denture by distributing the occlusal forces uniformly. Overdenture in the era of implant dentistry allows the preservation of natural teeth and also helps in improving the proprioception and the masticatory efficiency. This case report discusses the fabrication of over-denture using ball attachments by preserving the remaining mandibular teeth.

KEY WORDS: Resorption, overdenture, retention, stability, proprioception, attachments.

Received : 18.01.2019
Accepted : 18.02.2019
Published : 26.03.2019

INTRODUCTION:

Edentulousness can have an adverse impact on the mental attitude of the patient as it affects their aesthetics and masticatory efficiency. In conventional complete denture wearers, it is mostly observed that there is a progressive loss of residual alveolar bone due to the transfer of all occlusal forces from the teeth to the oral mucosa. Thus, it is important to preserve the remaining natural teeth which can help in reducing the residual bone resorption, improving retention and stability of the denture, enhancing the masticatory function, providing proprioception and psychological benefit to the patient¹.

According to DeVan “Perpetual preservation of what remains is more important than the meticulous replacement of what is missing”². Overdenture is a removable dental prosthesis which covers and rests on one or more natural teeth, the roots of natural teeth and /or dental implants; a dental prosthesis that covers and is partially supported by natural teeth, tooth roots, and/or dental implants. It is also called as an overlay denture, overlay prosthesis or superimposed prosthesis². They are indicated for the patient normally considered for full-mouth extraction because of caries or advanced periodontal disease. But overdentures should not be used as an alternative for a fixed or removable partial denture.

Coronally modified or restored retained teeth abutments are frequently endodontically prepared and used as abutments for an overdenture. The types of tooth supported overdentures based on the method of abutment preparation are:

1. Non-coping
2. Coping; short and long;
3. Attachments: intracoronal and extracoronal
4. Submerged vital roots³.

Maintenance of good oral hygiene to prevent caries and periodontal diseases, encroachment of the vertical dimension due to the bulk of the overdenture and additional costs of the abutment and denture base modifications are certain disadvantages of the tooth supported overdentures⁴. Implant retained overdenture is also an option but is sometimes not possible due to insufficient amount of bone

or economic reasons. This paper presents a tooth supported overdenture case where esthetics and function were restored without the complete extraction of lower teeth.

CASE REPORT:

A 52 year old male patient reported to the Department of Prosthodontics, with the chief complaint of difficulty in mastication due to missing lower teeth. There was no relevant medical history. Intra-oral examination revealed missing lower teeth except mandibular right and left canines - 33 and 43 (Fig 1).

The different treatment options for prosthetic rehabilitation were given to the patient- 1) Extraction of remaining teeth followed by conventional complete dentures; 2) Implant retained prosthesis; OR 3) Retaining the remaining teeth for tooth supported overdentures.

The patient did not choose implant retained prosthesis due to additional surgical procedures, extended duration of treatment and associated expenditures. Thus it was planned to retain the remaining natural teeth and fabricate a tooth supported overdenture with extra coronal radicular stud attachments.

The approximate vertical dimension of occlusion is determined by fabricating the preliminary casts with wax rims. The interarch space can be assessed with the help of diagnostic articulation and it was found to be adequate. The attachment system was selected as OT CAP, Rhein 83 Inc, USA based on the available space. OT Cap provides a “Cushion Effect” similar to a shock absorber and functions as a stabilizing retentive connector. This is achieved by the design of the sphere in conjunction with the elastic retentive caps. The design of the sphere with a flat head permits vertical movement during mastication. Rhein83 female caps are manufactured out of a special nylon material that remains stable and its longevity is increased by its proper functioning in the oral cavity⁴.

Intentional endodontic therapy was carried out in 33 and 43 teeth and they were prepared in dome shaped contour with height approximately 3-4 mm above the gingival margin. Post space was

prepared in which a 23 gauge stainless steel wire was inserted and a pick up impression was made using light bodied rubber base impression material (Zhermack elite HD+ addition silicone). (Fig 2)

Co-Cr copings with ball attachments (Rhein 83 Inc, USA) attached with prefabricated metal posts were fabricated in the laboratory. Ball attachments were covered with elastic retentive rings on the top.



Fig 1: Pre-operative view

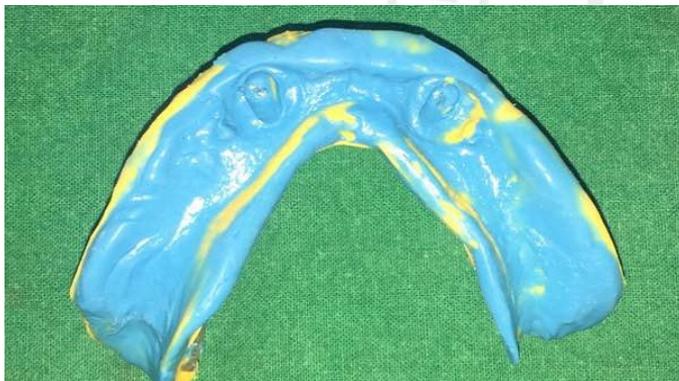


Fig 2: Light body impression for attachment fabrication



Fig 3: Metal coping with ball attachments luted on the abutment teeth



Fig 4: Light body master impression with the OT caps



Fig 5: Intaglio denture surface with the metal housings



Fig 6: Processed Mandibular Overdenture

These copings were tried in patient's mouth to check its fit and parallelism. They were then luted to the abutment teeth with Glass ionomer luting cement (GC Fuji Gold Label Type 1 Glass Ionomer Luting and Lining cement). (Fig 3)

Alginate impression of lower arch was made and a special tray was fabricated on the cast

after block out. Border moulding was done using conventional techniques and master impression was made with light bodied rubber base material. (Fig 4)

Record bases with wax rims were fabricated and jaw relation was recorded. Teeth arrangement was done and trial was checked. After proper wax up, the denture incorporated with stainless steel housings for the attachment was processed using heat cure acrylic resin. (Fig 5)

Denture stability, retention and phonetics were checked which was later inserted. Post insertion instructions were given to the patient. (Fig 6) Periodic review was carried out for 2 years.

DISCUSSION:

The oral rehabilitation of the patient with a few teeth is a prosthetic challenge as it is important to make a decision whether to completely extract remaining teeth to give prosthesis or retain them to give a tooth supported overdenture with added benefits of enhanced retention and stability of the prosthesis, patient proprioception, maintain the integrity of the remaining alveolar bone and improve patient satisfaction.⁵ These overdentures have additional retention due to their attachments. Case selection is very important in such situations. Selection of the type of attachments depends upon the crown-root ratio, vertical space available, number and location of retaining teeth, opposing dentition, angulations of roots, quality and quantity of bone, mastication patterns, patient musculature and desire^{6,7}.

The purpose of the attachments is to redirect forces away from weak supporting abutments onto soft tissue or towards stronger abutments thereby resulting in superior retention^{8,9}. Attachments are either be connected to cast abutment copings (short or long) or intra-radically. Overdenture attachments are classified either as studs, where the prosthesis is connected to the individual tooth, or as bars where the prosthesis is connected to the splinted abutment teeth. They are further classified as rigid or resilient.^[9] Rigid attachments often undergo fatigue failure and root fracture in compromised edentulous situations. The prosthesis that relies on resilient attachments (E.g.: Metal O ring system) has built-in stress-breaking action which compensate for the multidirectional loading forces acting on the weak

abutment teeth⁹. In this case report, canine teeth were used as abutments for the overdenture on which coping with ball attachments were fabricated. The coping with ball formed the male component and the metal housings with the elastic retentive rings in the denture formed the female component. These resilient mechanical attachments exhibit enhanced retention and function as stress absorbers and redirectors by providing movement to the prosthesis.

They are less bulky and easier to use and clean as well⁵. Maintenance of oral health and patient attitude towards the treatment should also be assessed^{1,4}.

CONCLUSION:

This case report discusses an ideal case for the fabrication of an overdenture by retaining the remaining healthy natural teeth which aids in the additional stability and retention of the prosthesis. Tooth supported overdentures incorporates Preventive prosthodontics which is very important to enhance patient acceptability as well. Thus it can be considered as a reliable alternative option to total edentulism as well as dental implant surgery for prosthetic rehabilitation.

FINANCIAL SUPPORT AND SPONSORSHIP:

Nil

CONFLICT OF INTEREST :

There is no conflict of interest

REFERENCES:

1. Bhandare V. Rehabilitation with overdenture using modified impression techniques - a case report. *Journal of Dental and Medical Sciences* 2015; 14(10):102-107.
2. Glossary of prosthodontic terms. *The Journal of Prosthetic Dentistry* 2017;117(55):e1-e105.
3. Zamikoff II. Overdentures- theory and technique. *Journal of American Dental Association* 1973;66:853-857.
4. Prakash V, Shivaprakash G, Hegde S,

- Nagarajappa. Four and two teeth supported conventional overdenture - two case reports. *International Journal of Oral Health Sciences* 2013;3(1):61-64.
5. Jivnani H, Singh K, Kishor K, Chand P, Solanki N. Stud attachment retained mandibular overdenture- a case report. *International Journal of Oral Health Dentistry* 2016;2(1):43-46.
 6. Langer Y. Tooth supported telescopic prostheses in compromised dentitions: a clinical report. *Journal of Prosthetic Dentistry* 2000;84(2):129-132.
 7. Samra RK, Bhide SV, Goyal C, Kaur T. Tooth supported overdenture: a concept overshadowed but not yet forgotten. *Journal of Oral Research And Review* 2015;7:16-21.
 8. Warren AB. Load transfer to alveolar bone as influenced by abutment designs for tooth-supported dentures. *Journal of Prosthetic Dentistry* 1975;33(2): 137-148.
 9. Bansal S, Aras MA, Chitre V. Tooth supported overdenture retained with custom attachments: A Case Report. *Journal of Indian Prosthodontic Society* 2013; 14(1):S283-S28.W

