

# Tooth Supported Mandibular Single Overdenture: A Case Report

Mandeep Kaur, Saurav Bansal, and Kuljit Kaur

## ABSTRACT

**Background:** Loss of teeth can be a reason for psychological trauma in most of the patients. Other than psychological loss there is also mechanical loss of bone with loss of teeth as alveolar bone is lost. Preservation of a couple of teeth can help in providing better retention and stability to dentures by minimizing bone loss and the use of mechanical aids on retained teeth for additional retention. The use of coping with attachment enhances the retention in the otherwise resorbed residual ridge. The single mandibular denture needs more stability also because of more amount of force from maxillary natural teeth. Thus, the denture can be strengthened by the use of additional mesh in the denture to compensate for the loss of acrylic in place where copings are placed.

**Case Report:** This is a case of 58 year old female with a partially edentulous mandible. The fixed prosthesis was lost recently. The transition to a complete denture with minimal mandibular ridge was difficult. So, the preservation of the roots of the remaining teeth was planned for mandibular overdenture.

**Treatment Plan:** Copings with attachments on bilateral canines were planned. The remaining teeth were given metal housings. The denture was reinforced with metal mesh to bear the maxillary forces from natural teeth.

**Conclusion:** a single mandibular overdenture with copings and attachments increases the retention and stability of the prosthesis and also gives psychological comfort to the patient for the preservation of natural teeth.

**Keywords:** metal coping, metal mesh, precision attachment.

**Published Online:** October 03, 2023

**ISSN:** 2684-4443

**DOI:** 10.24018/ejdent.2023.4.5.299

**Dr. M. Kaur\***

Apex Dental Care, India.

(e-mail: dr.mandeepkaur@gmail.com)

**Dr. S. Bansal**

Bansal Dental Care, India.

(e-mail: sauravbansal81@gmail.com)

**Dr. K. Kaur**

Kkaur Smile Dental Care Centre, India.

(e-mail: jyoti.takhi@yahoo.in)

\*Corresponding Author

## I. INTRODUCTION

The loss of dentition is considered as a disability by some as it hinders their day to day functioning like chewing or speaking. It causes social stigma to some as their esthetics is compromised. To overcome these, a transitional option is always considered better. Overdentures provide this transitional phase as they preserve some of the natural teeth and give an artificial substitute, that is, denture, which restores the esthetics and function to a better position than a completely edentulous jaw [1]. Glossary of Prosthodontic Terms (GPT-9) describes overdenture as any removable dental prosthesis that covers and rests on one or more remaining natural teeth, the roots of the natural teeth, and/or dental implants; a dental prosthesis that covers and is partially supported by natural teeth, natural tooth roots, and/or dental implants [2].

As per De Van's famous dictum, 'perpetual preservation of what remains is more important than meticulous replacement of what is missing.' Preservation of teeth not only provides psychological comfort to the patient, but it also helps in preservation of alveolar bone around the remaining natural teeth as well as preservation of physiological periodontal sensory input that guide and monitors gnathodynamic functions [3]. Periodontium provides shock absorber function, allows physiological tooth mobility and elastic modulus of

teeth being closer to the bone, than implant to the bone, and helps in functional bone stimulation for preservation of alveolar bone [4].

Various studies have shown that the loss of mandibular bone is 4 times more than that of maxilla after loss of dentition. Inherent problems of conventional complete dentures like retention and stability can be easily overcome by the use of tooth or implant supported overdentures [5].

Socio-economic status, gender and profession play an important role in selecting the treatment plan for a patient. In this case, female patient had having fixed shortened dental arch prosthesis in mandible. Loss of an abutment tooth, leads to the failure of the prosthesis. The patient was not ready for the implant prosthesis or complete mandibular denture as she was a public speaker and did not want to remain without teeth for long. So tooth supported mandibular overdenture was planned with vertical attachments on bilateral canines for additional retention. Since it was a single denture, to overcome the chances of fracture of denture, a metal mesh was placed in the denture fabrication.

## II. CASE REPORT

A 58-year-old female patient visited Bansal Dental Clinic with the chief complaint of the recent loss of her fixed prosthesis in mandibular arch. History revealed recent loss of

prosthesis with an abutment tooth. On clinical examination, tooth number 35, 33, 32, and 43 were present with no clinical mobility. Remaining residual ridge was resorbed as patient told about loss of posteriors long time ago which was replaced by removable partial denture. Patient was given the option of tooth supported overdenture or complete mandibular single denture. Patient was explained about the better retention with precision attachment retained tooth supported overdenture as there was residual ridge resorption. Patient agreed to overdentures without any extraction of her remaining natural teeth (Fig.1).



Fig. 1. Pre-operative.

Root canal therapy of the remaining teeth was performed. Bilateral canines were to be used for precision attachment, so vertical attachments were planned. After root canal therapy was completed, all the remaining natural teeth were prepared to receive all-metal copings by giving chamfer margins (Fig. 2).



Fig. 2. Tooth preparations done.

Impressions were made in addition silicone putty and light body (Fig. 3).



Fig. 3. Mandibular Impressions.

Metal coping with vertical precision attachments was fabricated on 33 and 43. After checking all the metal copings for adequate fit and inter-occlusal clearance, they were cemented with Type 1 Glass Ionomer Cement. Excessive cement was removed with the help of explorer and dental floss (Fig. 4).



Fig. 4. Metal copings cementation done.

Conventional technique of denture fabrication was followed. Primary maxillary and mandibular impressions were made with irreversible hydrocolloid (Fig. 5).



Fig. 5. Primary impressions.

Self-cure acrylic resin denture base with wax spacer around the copings was constructed. Then border molding using low fusing impression compound was done. Vinyl polysiloxane light body was used for making mandibular final impression (Fig. 6).



Fig. 6. Mandibular border moulding and final impression.

After retrieving the cast poured in type IV die stone, self cure acrylic resin denture base with occlusal rim was fabricated for recording of maxilla-mandibular occlusal relations. After verifying the phonetics and esthetics, the mandibular occlusal rim was sealed with maxillary cast matching the imprints on the mandibular rim from natural maxillary teeth (Fig.7).



Fig. 7. Final prosthesis post-insertion.

Shade selection was done by matching the color of natural teeth with the available shade guide. After mounting the maxillary and mandibular casts, teeth arrangement was done on the mandibular occlusal rim. Maxillo-mandibular relations esthetics and phonetics were verified in the patient's mouth (Fig. 8).



Fig. 8. Try-in done.

After try-in appointment, conventional method of denture was followed. After the step of dewaxing, laboratory analogue of the precision attachments was placed over the metal housing in the cast to provide the space for copings in final denture. Also, after packing the heat cure acrylic resin and trial closure, metal mesh was inserted from the intaglio surface. After the processing and final finishing and polishing of the denture, it was checked in patient's mouth for fit and any impingements. Then using self-cure acrylic resin, precision attachments were attached to the space provided (Fig. 9).

Final denture insertion was done and the patient was given post-operative denture care instructions (Fig. 10).



Fig. 9. Mandibular denture.



Fig. 10. Post-operative

### III. DISCUSSION

With the increasing life expectancy of people, there's an increase in geriatric problems. One such problem in dentistry is that of edentulism. With technological advancements,

people are willing to save their natural teeth or for fixed prosthesis rather than any removable prosthesis. However, high cost of the implants or other fixed prosthesis makes them unaffordable for people of low economic status. Thus dentists in 1960s developed the concept of tooth supported overdentures [6]. It is also found that more bone loss occurs in anteriors as compared to posteriors and more in mandible than maxilla. Thus preservation of tooth in anterior mandible is critical to maintain alveolar ridge in mandible [7].

In the present case, mandibular anteriors were preserved. Conservation of alveolar ridge, maintained proprioception, increased retention, and support are some of the advantages of overdentures [7]. Loss and fracture [8] of abutment tooth or frequent recall visits for increasing longevity of the prosthesis are some of the disadvantages of the overdenture prosthesis [7].

Some studies have shown the loss of attachment for overdentures as site and arch specific [9]. More attachment loss is observed at buccal of mandibular canines due to more denture movement. To overcome this and the chances of vertical fracture of roots under masticatory loads, Ettinger and Qian8 suggested the use of thimble crown. Hence, metal copings were placed over the natural teeth.

In a study, Chen *et al.* reported that masticatory efficiency was maximum with implant supported overdenture, followed by tooth supported overdenture, and least with conventional completed denture[10]. Kapadia et al stated the possibility may be due to proprioception from periodontal ligament sends negative feedback for excessive forces[11]. However, they suggested a better chewing efficiency with root supported overdentures as patients with implant supported prosthesis had been force to pulverize food but not for manipulation of food in posterior regions.

Some of the limitations of the overdenture include, loss of abutment tooth due to caries, repeated recall visits, and thinning and overcontouring of denture bases in place of natural teeth. Metal copings were placed to prevent caries and fractures. To provide strength to the denture due to excessive thinning and excessive forces from opposing natural dentition, metal mesh was inserted.

### IV. CONCLUSION:

An economical alternative to implant-supported overdentures is retaining the natural teeth. Bilateral tooth should be present to provide for cross arch stabilization. Regular follow-up is essential for the longevity of the prosthesis and for the preservation of the health of the remaining teeth.

### REFERENCES

- [1] Mercouriadis-Howald A, Rollier N, Tada S, McKenna G, Igarashi K, Schimmel M. Loss of natural abutment teeth with cast copings retaining overdentures: a systematic review and meta-analysis. *Journal of Prosthodontic Research*. 2018;62(4):407-15.
- [2] Ferro KJ. The Glossary of Prosthodontic Terms. GPT-9. The Academy of Prosthodontics.
- [3] Kumar V, Gupta S, Krishnan Y, Vishnoi L. Tooth supported overdenture-A preventive approach in prosthodontics. *International Journal of Oral Health Dentistry*. 2020;4(3):184-7.



- [4] Drashti G, Rajesh S. Tooth supported Overdenture: Imperative treatment modality: Root to basics. *Int J Applied Dent Sci.* 2019;5(4):16-21.
- [5] Satyendra K, Kumar D, Legha VS, Kumar KA. Specially designed tooth supported mandibular overdenture with enhanced retention. *Medical Journal Armed Forces India.* 2015 Dec 1;71:S546-8.
- [6] Fenton AH. The decade of overdentures: 1970-1980. *The Journal of Prosthetic Dentistry.* 1998 Jan 1;79(1):31-6.
- [7] Devi J, Goyal P, Verma M, Gupta R, Gill S. Customization of attachments in tooth supported overdentures: Three clinical reports. *Indian Journal of Dental Research.* 2019 Sep 1;30(5):810.
- [8] Ettinger RL, Qian F. Abutment tooth loss in patients with overdentures. *The Journal of the American Dental Association.* 2004 Jun 1;135(6):739-46.
- [9] Ettinger RL, Qian F. Incidence of attachment loss of canines in an overdenture population. *The Journal of Prosthetic Dentistry.* 2014 Dec 1;112(6):1356-63.
- [10] Chen L, Xie Q, Feng H, Lin Y, Li J. The masticatory efficiency of mandibular implant-supported overdentures as compared with tooth-supported overdentures and complete dentures. *Journal of Oral Implantology.* 2002 Oct 1;28(5):238-43.
- [11] Kapadia A, Wankhade S, Khalikar A, Deogade S, Mukhopadhyay P, Dutta V, et al. Comparing the functional efficiency of tooth-supported overdentures and implant-supported overdentures in patients requiring oral rehabilitation: A systematic review. *Dental Research Journal.* 2022;19.