



A Cost Effective and Simple Tooth Supported Overdenture with Custom Made Intra Coronal Attachments: A Case Report

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[Case Report](#)

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ABSTRACT

Rehabilitation of a decimated dentition proper diagnosis, planning, and executing is probably one of the most knowledgeable and technically orienting tasks faced by a prosthodontist. Attachments are small interlocking devices, which connect both prostheses and abutments offering a variety of solutions for challenging balance between functional stability and cosmetic appearance. This clinical case report describes a multidisciplinary approach for complete oral rehabilitation of a patient with few remaining natural teeth using as a radicular attachment (Dalbo-stud attachments) for mandibular overdenture and maxillary overdenture is retained by cast metal copings (long coping).

Keywords: Overdenture, Abutments, Occlusal Forces, Retention, Intra Coronal Attachments.

Introduction

Case Report: A 62-year-old male patient reported to the Department of Prosthodontics, Rural Dental College Loni, with the chief complaint of difficulty in chewing. Dental history revealed that he was using removable partial denture, but couldn't anymore as the denture was getting dislodged.

Intraoral Examination and Treatment Plan

On examination teeth present were 15, 24, 25, 33 and 43 [Figure 1]. Considering the patient complaint, background, and condition of the oral cavity overdenture with Intra coronal dalbo stud attachment with mandibular arch and maxillary overdenture retained by cast metal long copings was planned. The treatment planning included endodontic phase, prosthodontic phase, and maintenance. The endodontic phase involved intentional endodontic treatment with teeth 15, 24, 25, 33, and 43 followed by the prosthodontic phase.



Figure 1: Pre Treatment Intraoral Picture of Teeth Present

Prostheses Fabrication

Primary impressions were made for both maxillary and mandibular arch with irreversible hydrocolloid impression material and poured in dental stone to obtain the diagnostic cast. A tentative jaw relation was recorded using a record base and wax rims for measuring inter-ridge space.

For Maxillary Overdenture (Cast Metal Long Copings with 15, 24, 25).

- Tooth preparation steps were undertaken for teeth 15, 24, 25, and impression was made with additional silicone impression material and poured in die stone to get the first master cast.
- The prepared teeth were waxed up in a conventional manner [Figure 2] followed by casting and finishing. [Figure 3]
- Next, these metal casted copings were cemented on the prepared teeth in the maxillary arch. [Figure 4]
- A New Primary cast was made using irreversible hydrocolloid impression material. A special tray was made by applying a two-layer thick spacer around the copings. Border molding was carried out in a conventional manner followed by a final impression with light body impression material was made and poured in die stone to get the second master cast. [Figure 5]
- The record base was fabricated by sprinkle on method with a self-cure acrylic resin material (DPI). The maxillary occlusal wax rim was made and adjusted.



Figure 2: Waxed up Copings on Cast



Figure 3: Metal Casting and Finishing of Coping Done



Figure 4: Metal Copings Cementation Done Intraorally **Figure 5: Master Cast Obtained.**
For Mandibular Overdenture: (Dalbo stud attachment with 43 and 33)

- Teeth were reduced to the level of adjacent gingival and the sharp edges of teeth were rounded up. Length of the root canal space was confirmed using IOPA [Figure 6]. Next, this root canal space was prepared with the gates glidden drill. Reamer was used to preparing for the diameter of the post. Fabrication of the customize attachment by using pattern resin was done [Figure 7].
- Intraradicular impressions were made by using toothpick stick and low fusing impression compound. Further post with the attachment was cast in metal as a single unit [Figure 8] and cemented intra radicular with Glass Ionomer Cement Type I [Figure 9]. The primary cast was made using irreversible hydrocolloid impression material.
- A special tray was made by giving two-layer thick spacer around the posts. Border molding was carried out in a conventional manner. Final impressions were made with light body impression material, Impression was poured and the master cast was obtained [Figure 10].



Figure 6, Radiographic Confirmation for Canal Preparation.

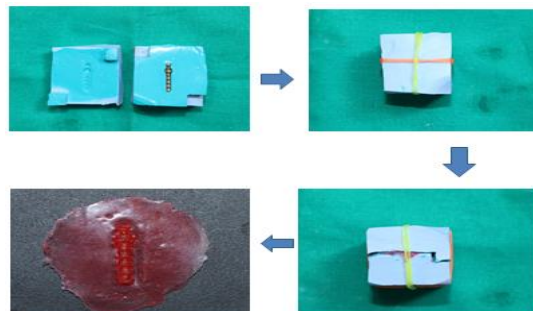


Figure 7: Customized Intraradicular Attachment Preparation.



Figure 8: Intraradicular Impressions and Metal Casted Attachments (43, 33)



Figure 9: Cementation of Intraradicular Attachments.



Figure 10: Final Impression and Master Cast.

Orientation jaw relation was recorded using both upper and lower occlusal rims [Figures 11]. Teeth arrangement and try-in of denture was done to check centric relation, vertical dimension, and esthetics. For mandibular denture fabrication, denture flasking, dewaxing, and acrylization were done in a conventional manner. Black colour rubber spacers supplied in the kit were placed over the posts and metal female housing was placed over the post and denture was picked up along with the metal female housing embedded in it. Finished maxillary and mandibular overdenture [Figures 12] were delivered and instructions were given to the patient and recalled after 24 hours.



Figure 11: Orientation Jaw Relation Recorded.



Figure 12: Pre and Post Treatment Pictures.

Discussion

Using natural teeth as abutments for attachments in overdenture cases is a better choice for tissue, and time tested alternative for those patients who cannot effort implants or are not fit for implant surgeries such as medical contraindications and cost factors.

Intracoronary attachment retained overdenture helps in minimizing trauma to abutments and soft-tissue by a distribution of masticatory forces. It also reduces ridge resorption, improves esthetics, and retains proprioception. Using such attachments can implement direct occlusal forces on attachments itself than directing it on weak supporting abutments and onto surrounding soft-tissues. They provide superior retention as well as shock absorbers and stress redirectors. The purpose of the success of an overdenture is the proper selection of tooth or root for retention. The shortened crown improves the crown-root ratio, thereby decreasing the motility of the abutment teeth under the stress of an overdenture.

Fenton and Hahn (1978) showed that 0.4% stannous fluoride gel had a beneficial effect on the gingival health of the abutments. Root canal therapy is an important phase in overdenture treatment and single-rooted or double rooted teeth with accessible canals are generally preferred.¹ The retention of some abutment teeth under the overdenture keeps intact the associated periodontal structures and thus a limited ability to sensory input into the CNS at the perceptive and proprioceptive levels. Anterior teeth are more sensitive compared to posteriors, it perceives even if there is a smaller tactile and pressure stimuli. Canines are stated to be the most



richly innervated and sensitive amongst all teeth and thus become the preferred abutment teeth under overdentures. Also due to their long triangular roots, they are retained in the system for longer duration.² Taking care of the abutment teeth or roots by antimicrobial mouthwashes like Chlorhexidine 0.12% is very effective in reducing the oral bacterial population, but must be used for short-term periods as they affect the normal mouth flora.³

The importance of the relationship of the Stud Attachments is having all of the stud attachments parallel to each other. Some universal attachments may be as much as 5–7 degrees out of parallel with each other and still function properly.⁴ Relationship of the Stud Attachments with the Path of Insertion should not interfere with the overdenture. Achieving an ideal alignment is much more difficult with taller attachments than with shorter ones hence the height of the attachment also plays an important role in planning overdenture.

Conclusion

It has been wisely said that "the best implants are the natural teeth or their healthy remaining roots." Tooth retained overdenture is an excellent treatment alternative to conventional complete denture. A proper knowledge and innovative techniques of attachments in various different cases is a huge need to develop sophisticated systems more economically. The technique used in this article provides excellent retention, support and stability and has full patient acceptance.

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